BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 18, 1976

EXAMINER HEARING

IN THE MATTER OF:	
Application of Tahoe Oil and Cattle Company for an exception to the provisions of Order No. R-3221, Eddy County, New Mexico.	CASE 5709

BEFORE: Richard L. Stamets, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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For the Applicant:	Jack M. Campbell, Esq. CAMPBELL & BINGHAM Attorneys at Law P. O. Box 2208 Santa Fe, New Mexico
For the Snyder Ranches:	J. W. Neal, Esq. NEAL & NEAL Attorneys at Law P. O. Box 278 Hobbs, New Mexico

APPEARANCES CONTINUED:

For Pollution Control, Inc.: James M. Maddox, Esq.
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I N D E X

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MR. STAMETS: We will call at this time Case 5709.

MR. CARR: Case 5709, application of Tahoe Oil and Cattle Company for an exception to the provisions of Order No. R-3221, Eddy County, New Mexico.

MR. STAMETS: Call for appearances in this case.

MR. CAMPBELL: Jack M. Campbell, Campbell and Bingaman, P. O. Box 2208, Santa Fe, New Mexico appearing on behalf of the applicant.

MR. STAMETS: Are there other appearances in this case?

MR. NEAL: J. W. Neal of Neal and Neal, Box 278, Hobbs, New Mexico appearing on a protest of the Snyder Ranches, Inc.

MR. MADDOX: James M. Maddox of Maddox, Maddox and Cox, attorneys in Hobbs, P. O. Box 2508, appearing on behalf of Pollution Control, Inc. in protest.

MR. STAMETS: Any other appearances? Mr. Campbell, you may proceed.

MR. CAMPBELL: We were in the process, Mr. Examiner, of marking these exhibits which we haven't completed. We have, I believe, two sets fully marked which would -- and we have other sets that are not marked, can we proceed on that basis?

MR. STAMETS: Yes.

MR. CAMPBELL: Mr. Examiner, I would like to make a

very brief statement at the outset of this case primarily to ask the Commission to take administrative notice of two orders of the Commission, the first being Order No. R-3221 and the other being Order No. R-3221-B. The original order prohibited the disposal of salt water in certain counties in Southeastern New Mexico. Amendment B to that order dated July 25th, 1968 established certain exemptions from that order and I'm asking the Commission particularly to take administrative notice that all of Township 20 South, Range 30 East is exempt from that order and to take particular notice of paragraph, parenthesis, Arabic number 4, 5, 8, 10 and 11 of its findings in that order R-3221-B.

MR. STAMETS: The Examiner will note these orders and findings.

MR. CAMPBELL: I now would like to ask that two witnesses appearing on behalf of the applicant be sworn, Mr. Freeman and Mr. Skrabacz.

MR. STAMETS: At this time I would like to have anybody who is going to be or might potentially be a witness in this case stand and be sworn.

MR. NEAL: Mr. Squires on behalf of Snyder Ranches. Larry, stand up and be sworn, please.

(THEREUPON, the witnesses were duly sworn.)

MR. CAMPBELL: I would like to call Mr. Freeman first.

KENNETH FREEMAN

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

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q. Will you state your name and give your residence, please?

A. Kenneth Freeman, 2504 Seaboard, Midland, Texas.

Q. Are you an official of Tahoe Oil and Cattle Company?

A. Yes, I am.

Q. What capacity do you have with the company?

A. I'm president.

Q. Is that company authorized to do business in New Mexico as a corporation?

A. Yes, it is.

Q. Would you give the Examiner a brief resume, please, of your educational and professional background?

A. I graduated from the University of Texas in 1958 with a Bachelor of Science degree in petroleum engineering. I have been employed in the oil and gas industry since graduation. In 1968 I became a Registered Professional Engineer in the State of Texas. I have done hearings in the States of Oklahoma, Texas and New Mexico.

Q. Has your experience in the oil and gas industry led you to do work specifically in the State of New Mexico during the course of your career?

A. Yes, it has.

Q. What general kinds of activities have you been involved in?

A. When I was employed by Union Texas Petroleum I was in unitization, worked on secondary recovery units in Southeast New Mexico and I have done consulting work as far as drilling and completing oil and gas wells in Southeast New Mexico.

Q. Is this your first venture into the arena of waste disposal?

A. Yes, it is.

Q. I presume you are acquainted with the application in this case?

A. Yes, I am.

Q. Would you explain in general terms at this point what it is you are seeking to do?

A. We are seeking to get an approved method of disposing of produced water in an area that has highly mineralized water and has been exempt from the no-pit order whereby water from oil and gas wells can be hauled into this area and we will dispose of it and it will primarily be evaporated and I feel that this is a very good way of handling

this produced water and getting rid of it.

Q. Now, Mr. Freeman, I'm going to hand you what has been identified, I believe you have a copy of it before you, as Applicant's Exhibit One in this case. I want to ask you to state what that is and what it reflects?

A. Exhibit One is a copy of the surface ownership. The area of interest is located in Section 2, Township 20, Range 30, Eddy County, New Mexico. From the town of Carlsbad this is approximately twenty-one miles northeast.

Q. And would you point out for the Examiner where the general disposal site is to be situated? Is that shown on this?

A. The disposal site will be located in Section 2 which has been outlined and colored in in yellow. In specific, it will be located within the ten-acre tract in the northwest corner of this colored-in hundred-and-sixty-acre tract and it is also marked with an "X".

Q. Now, are there any other features that do not appear on this map that you would like to identify or call the Examiner's attention to because it will be referred to later in the hearing?

A. I would like to point out in Sections 9 and 10 there are presently lakes or tailing pond areas of the PCA Company that we may refer to later.

Q. Is the land shown in yellow on Exhibit One owned in

fee, that is in fee ownership?

A. Yes, it is, by Mr. L. H. Bates of Carlsbad, New Mexico.

Q. Do you have permission from Mr. Bates to proceed with obtaining the appropriate public agency approvals for this installation?

A. Yes, we have Exhibit Number Two.

Q. I hand you now Exhibit Number Two and ask you, please, if you will read that for the record?

A. Exhibit Number Two is dated April 19th, 1976, it states: (Reading) This document is intended to establish that the property owned by L. H. Bates in the west half of the southeast quarter and the east half of the southwest quarter of Section 2, Township 20 South, Range 30 East, Eddy County, New Mexico, which is patented fee land will be leased to the party asking for a permit to dispose of produced salt water if the State and/or other agencies grant the proper permits and licenses necessary to carry on such a business. (End of reading.)

Q. And this is signed by L. H. Bates and by you and witnessed by my secretary?

A. Yes.

Q. Are there, to your knowledge, any oil and gas leases covering any or all of this tract shown in yellow on Exhibit One?

A. Yes, sir, there is an oil and gas lease in force under this hundred-and-sixty-acre tract and it is owned by Amoco Production Company.

Q. Do you have a surface use waiver from Amoco in regard to that oil and gas lease?

A. Yes, I do in reference to the ten-acre tract in the northwest corner of this hundred-and-sixty acres.

Q. I hand you what has been identified as Exhibit Three and ask you if this is a copy of that surface use waiver?

A. Yes, it is.

MR. CAMPBELL: Mr. Examiner, we have the originals of these two exhibits. If anyone insists we will put them in and withdraw them, otherwise we will just introduce copies.

MR. STAMETS: I think that will be fine, Mr. Campbell.

Q. (Mr. Campbell continuing.) Now, Mr. Freeman, I hand you what has been marked as Exhibits Four and Five and ask you to state first what each one of those is?

A. Exhibit Number Four is a sketch of a surface pit that if approved would be constructed in the middle of this ten-acre tract that I have referred to in Section 2. It would be approximately two-hundred-and-nine feet square, a foot-and-a-half deep, which would hold approximately, when full, ten thousand barrels of water. This pit would be fenced and kept clean so we could have a maximum evaporation.

Q. And what is Exhibit Five?

A. Exhibit Five is a sketch of a tank hook-up, three five hundred barrel tanks. These tanks will be galvanized tanks and they will be internally plastic coated to hold down corrosion from the water that would be trucked in. Their main purpose is to form a skimming system whereby there could be condensate and/or crude oil hauled in with some of the produced water and how this would work, the trucks would pump the fluid into one tank, it would gravity over into the second and the third tank would be used as an accumulator for the hydrocarbons and when enough hydrocarbons would be collected then they would be treated and sold.

Q. Using Exhibits One and Four and Five now, will you describe to the Examiner exactly how this installation would be set up and function in the event that it became operative?

A. Number one, it will depend upon the approval naturally, by this agency. Then we would go to the Bureau of Land Management and attempt to acquire a special land use permit which would be on the east side of Highway 31, which is shown on Exhibit One, wherever this could be obtained. Then we would construct a turn-around system where the trucks can drive in and turn around to have access to these three tanks to put the water into. Then the water would go into a plastic line. Now, this plastic line will go from the tanks approximately a mile-and-a-quarter east to the proposed disposal site. Now, this would be a plastic that would be

buried a foot-and-a-half in depth. The reason we have plastic is because corrosion will not attack it and so forth and there would be no damage whatsoever to any of the land from the tank site to the pit site in Section 2.

Q. And through this pipeline then, after the skimming takes place, the water will go into this dug pit, is that correct?

A. That is correct.

Q. Have you done any research on the evaporation rate and so forth in the area?

A. Yes, I have.

Q. Could you comment to the Examiner how you see that working in terms of the size of the pit and so forth, do you think this is adequate for your purposes at this time?

A. The one-acre pit for the amount of water we anticipate would be placed in the pit will be adequate. We feel like the evaporation rate based on this location would be eighty plus inches per year.

Q. Do you believe that by this process, in addition to disposing of produced waste water that you can recover oil and condensate by this process that might not otherwise be recovered?

A. Yes, I do. I base this on the Dean Penick disposal operation in the Cheyenne Draw in Winkler County, Texas. He accumulates from three to six hundred barrels of

oil per month from the water that is trucked into his disposal system and I assume that this would be a like operation as near as I can tell.

Q. Based upon your experience that you have recited in oil and gas production matters in New Mexico, is it your opinion, or what is your opinion with regard to the relationship between this installation, this facility, and the ultimate recovery of the maximum reserves of oil and gas in this area?

A. In my opinion there will be additional reserves recovered if the operators have a similar type place to put or dispose of their produced water. In these older fields the water ratio will increase and has increased to the point where it will have to be disposed of. Secondly in this Morrow drilling in the Carlsbad area with three-hundred-and-twenty acre spacing it is very difficult for operators to come up with a disposal system, so it will almost require that the water in the later life of the wells will have to be trucked and it is a matter of economics as far as distance from the well to where the water can be disposed of as to what the cost will be.

Q. What kind of an investment are you anticipating making in this installation iniatially?

A. Our AFE and so forth on the equipment and constructing the pit, the line and so forth would be forty thousand dollars.

Q. That's exclusive of costs of right-of-way and the legal fees?

A. Yes.

Q. And expert witness fees and that sort of thing?

A. Yes.

MR. CAMPBELL: I think that's all I have. I would like to offer Exhibits One through Five in evidence, Mr. Examiner.

MR. STAMETS: Any objection?

MR. NEAL: No objection.

MR. MADDOX: No objection.

MR. STAMETS: These exhibits will be admitted.

(THEREUPON, Applicant's Exhibits One through Five were admitted into evidence.)

MR. STAMETS: Are there questions of the witness?

MR. NEAL: I would like to ask a few questions.

MR. STAMETS: Mr. Neal.

CROSS EXAMINATION

BY MR. NEAL:

Q. Mr. Freeman, has there been any research by your company as to the subsurface water in that immediate area?

A. Yes, there has.

Q. Who did that for you?

A. Ed Reed and Associates.

Q. And is he here to testify today?

A. Yes, he is.

Q. Okay. Now, directing your attention to Exhibit Number Four, would you explain to me what the construction of the bottom of that pit will be?

A. This pit will simply be dug a foot-and-a-half deep and we have a bore hole analysis that will be presented later that will show you the actual formation which is primarily clays.

Q. At this time there is no intention to seal the bottom then with any plastic or concrete or anything of that nature?

A. No, there is not.

Q. Now, as I understand it you have testified that the evaporation rate in this size tank would be sufficient. What do you do in the event you have a large rain that would start an overflow of this tank onto the surface?

A. Well, if there is a large rain we will have to quit, shut down the hauling of water into the system until the evaporation rate can take care of it and I do not anticipate that it will get to the point of where -- we would have to have like a six-inch rain for this to overflow because we will present a map that will show the ground level elevations and so forth and this is high for the general area or one of the higher places.

MR. NEAL: What number is this?

MR. CAMPBELL: Seven, I believe.

THE WITNESS: Seven, but it's not in yet.

MR. NEAL: I understand that but I want to ask him if he is familiar with it.

Q. (Mr. Neal continuing.) Mr. Neal, are you familiar with what has been marked by your attorney as Exhibit Number Seven which has not been introduced in evidence yet. Are you familiar with that map?

A. Yes, I am.

Q. Now, I direct your attention to an area adjacent to the State Highway situated in Section 16, that shows approximately a three thousand, seventeen foot contour.

MR. STAMETS: Hold it a second. Okay, you are talking about along State Road 31 in Section 16, Township 20 South, 30 East?

MR. NEAL: Yes, sir.

Q. (Mr. Neal continuing.) Now, isn't there from your location in Section 2 on a contour, doesn't the natural draw on a thirty-two, oh, eight contour come down into the area of the northwest portion of Section 15 and the northeast of 16?

A. Yes.

Q. Isn't that correct?

A. Yes.

Q. And so if an overflow did occur at your disposal site then that brackish water would flow in that direction towards those sections would it not?

A. Yes, but I believe that it would also flow to this lake that is here. This is an existing lake.

Q. But it could also flow the other direction, couldn't it?

A. Yes, it could.

Q. Now, have you made any plans to construct a round tank as a safeguard where that would not occur, where that overflow would not drain in that direction?

A. No, we have not. We felt like we would limit this by the amount of water that we would have trucked in. In other words, if we had thirty days of rain the system will be shut down.

Q. Well, what would you do if the pit was full and we happened to have a southeastern rain that drops two inches of water immediately and this tank is brim full, it is going to have to overflow, is it not?

A. I would like to go back to my Exhibit Number One, referring to Sections 9 and 10 and if you will see on this topographic map, listed number seven, in the northwest corner there is a lake there, at this point here. I'm saying that if we have conditions like this that this lake will also overflow and go down this direction, so will this lake. We

have the water condition that is in this lake which the dissolved solids are in excess of what we will be putting into this pit and you will not be able to determine from this water here which we will introduce in testimony later, what the content of this is. It's the lake of the PCA that would also flow back to Section 16 that you are referring to.

Q. Well, is it a fact that PCA has constructed some dikes to avoid the movement of that water down into Sections 15 and 16 in order to avoid that flow, in order to keep from polluting this Snyder Ranches' property anymore than it has been in the past.

MR. CAMPBELL: Could we identify, Mr. Neal, for my information where the Snyder Ranch property is? Are you just concerned about Sections 15 and 16, is that correct?

MR. NEAL: If we may have a minute I'll show --

MR. CAMPBELL: Go off of the record a moment.

(THEREUPON, a discussion was held off the record.)

MR. STAMETS: Okay, back on the record.

Q. (Mr. Neal continuing.) Now, situated down in the northwest portion of Section 15 and also of the northeast of 16, there are a couple of springs, are there not, where cattle are watering, if you know?

A. I do not know. We have tested a water well, a windmill water in this area that another witness will get into

later here.

Q. You are unaware that there is a spring in that Section 16 where cattle have a watering?

A. I'm not aware of the spring in Section 16.

Q. Now, back to your construction again, will these sides be of dirt or will they be concreted or how will they be constructed?

A. They are going to be dirt which is primarily clay.

Q. As I understand it then, the trucks will come up, empty into a gathering barrel?

A. Tanks, five hundred barrel tanks.

Q. Then you will have your separation of your oil and water and the water will run through a plastic pipeline over to this evaporation pit?

A. Correct.

Q. All right now, I noticed in your application, it was also that you would transport water. Will you furnish trucks to move this water at a fee?

A. At this time we are not going to transport water ourselves.

Q. In paragraph three of your application it states that you will enter into contracts with producers of produced water for a fee to collect, transport and dispose of said water?

A. Yes, sir.

Q. You are not intending to do any transportation?

A. Not under the name of Tahoe Oil and Cattle Company.

Q. What will that be done under, what name?

A. That will be under third-party people.

Q. Has Tahoe Oil and Cattle Company made an application with the State Corporation Commission for a Certificate of Public Convenience and Necessity?

A. No, sir.

Q. At this time do you have any contracts with producers for this water, to dispose of this water?

A. No, we do not until we have the thing approved.

Q. Approximately within the immediate area, within a range of fifteen miles, let's say, have you made any estimate of the amount of water that needs to be disposed of?

A. Yes, I have.

Q. And what have you found that to be?

A. I would say six truck loads per day, hundred and thirty barrel loads.

Q. Where is the water at this time being disposed of?

A. I really don't know. Some of it is being hauled over to Pollution Control Lake, other is being put into disposal wells. I understand that they are having problems with a number of these disposal wells pressuring up and it has been indicated to me that there is a need closer by this area whereby to haul this water.

Q. Approximately how far is this disposal area which you propose from Pollution Control?

A. As the crow would fly this site would be approximately twelve miles to the west.

Q. And that is in a site, I believe, that heretofore has been approved by this Oil Conservation Commission?

A. Correct.

Q. In regard to the people you have indicated that are disposing now with Pollution Control, do you know whether or not they have contracts with Pollution Control?

A. I do not know their arrangements.

Q. So, you do not know whether or not this business that is presently going to Pollution Control would be available to you then.

MR. CAMPBELL: Mr. Examiner, I would like to get an understanding of what this line of questioning is intended to do. This is not a hearing on a Certificate of Public Convenience and Necessity. This Commission not only sure doesn't want to get into that but has no authority to get into it. If it is a competitive question we are engaged in here then I think we need to clarify that.

MR. NEAL: If the Examiner please, my position is this that I represent a rancher that has land immediately to the south of this proposed location. We also have land around, the ranch also extends over to another salt water disposal

lake which is owned by Pollution Control and if the services are not needed in this application we do not propose, we do not see why from the ranchers' standpoint this other area could not be used. We are not involved in competition or anything else we are engaged in the cattle business.

MR. CAMPBELL: In exploring this further, may I ask, did I understand it from you that the other disposal area is on the ranch?

MR. NEAL: It's around it, yes, sir.

MR. CAMPBELL: Well, is it in the interior of the periphery of the ranch?

MR. NEAL: It's not on this ranch it's on another one.

MR. CAMPBELL: The same company?

MR. NEAL: Yes.

MR. CAMPBELL: The same company, managed by the same people?

MR. NEAL: Yes, Mr. Squires will testify.

MR. CAMPBELL: May I ask one more question? Does the ranch or the management of the ranch have any ownership interest in the other case?

MR. NEAL: Mr. Squires individually, not the ranch, has a minute interest in Pollution Control.

MR. CAMPBELL: It seems to me, Mr. Examiner, and I'm not going to make a big issue of it here but I just want

to call to the attention of the Commission that it appears, at least in part, to be a question of public convenience or necessity to me and we're here before this Commission with a proposed private investment on private land and to the extent that it affects or is affected by the jurisdiction of this Commission having to do with conservation of oil and gas, prevention of waste and protection of correlative rights or to the extent that this Commission administratively has some obligations on the environmental side we are prepared to respond to those but we don't intend to if the Commission doesn't require us to to get engaged in a market survey here and decide whether somebody is going to take contracts away from someone else.

MR. STAMETS: The market factors, of course, cannot be considered in this particular hearing. The Commission would be concerned with questions of waste and the protection of fresh waters that would be relevant in this particular case. Mr. Neal, only so far as these contracts might affect those two particular questions would there be any point in pursuing it.

MR. NEAL: I was about ready to quit anyway on that particular point. That's all I have.

MR. MADDOX: I have no questions of the witness at this time.

MR. STAMETS: I have a question or two.

CROSS EXAMINATION

BY MR. STAMETS:

Q. What is the total daily amount of water that you expect to handle through this system, the maximum perhaps?

A. What we anticipate is three thousand barrels a day would be the maximum when we start off, we anticipate a thousand barrels or under but in essence the way I see it, it will increase over a period of years as the wells get in the latter stages of depletion of the Morrow gas wells and also of the various oil producing fields around that area.

Q. Is this three thousand barrels of water per day the maximum that you intend to dispose of in this area or is this just a maximum for this first stage?

A. Well, what I would say at this point is, it's the maximum first stage and if there is going to be much more water later, we would just have to come back with another application.

Q. So three thousand barrels of water per day is the limit for this application?

A. We'll settle on that.

Q. Will your other witness go into the calculations of the evaporation rate that you mentioned of eighty inches a year?

A. Yes, he can.

Q. Okay. Now, I believe you indicated that the water would come from the Carlsbad area gas wells, are there other

areas that you know about at this time?

A. Well, I've been told there are certain fields from the Abo and so forth that have a water problem, that water is currently being trucked and naturally there would be water from these areas if they wanted to dispose of it there and I feel that they will because there is a need.

Q. Do you have some particular leases in mind at the present time that would be trucked to this site if it were approved?

A. I could give you a better -- I have talked to trucking contractors like IW out of Artesia and he indicated to me that he would have two or three loads of water per day, that this would be a much more convenient place for him to dispose of the water. Now, I do not know where he is trucking the water from.

Q. By and large this would be water that is currently being trucked to some other site at the present time?

A. Yes.

Q. I believe this Pollution Control lake that has been referred to would be one of the ones that was approved by Commission Order R-3725, Laguna Plata and Laguna Gatuna?

A. Yes, sir.

MR. STAMETS: I believe that's all the questions I have at this time, I may have somemore at a later time.

MR. CAMPBELL: Yes, we may want to recall this witness

on rebuttal, I don't know, but he will be available either way.

MR. NEAL: May I ask one question in view of the Examiner's question.

MR. STAMETS: Yes, sir, Mr. Neal.

RECROSS EXAMINATION

BY MR. NEAL:

Q. In this three thousand barrels a day, will that be metered or how do you keep a record of that or do you?

A. Yes, sir, we plan on having -- well, in other words, a truck will handle a hundred and thirty barrels, a hundred and thirty to thirty-five barrels per load and they would fill out a ticket and we would keep track of the company that hauls it in.

Q. And would those records be available to the Oil Conservation Commission for inspection?

A. Yes, sir, they would.

Q. Or do you know, is there any requirement that you furnish this information to the Oil Conservation Commission?

A. It's my understanding that we have to keep track of the number of barrels that are hauled in every month.

MR. NEAL: Thank you.

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

(THEREUPON, the witness was excused.)

MR. CAMPBELL: Mr. Skrabacz.

CHESTER SKRABACZ

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

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q. Would you please state and spell your name?

A. My name is Chester Skrabacz, spelled S-k-r-a-b-a-c-z and I reside at 2407 Stanolind, Midland, Texas.

Q. By whom are you employed and in what capacity?

A. I have been employed in the capacity of geologist with Ed L. Reed and Associates since 1962.

Q. Would you give us a brief description of the corporate activities of Ed L. Reed and Associates, please?

A. E. L. Reed and Associates are primarily hydrologists that serve the southwest, including New Mexico. We have worked for the cities of Jal, Lovington, Carlsbad and we have done some work in this area for Mr. Larry Squires, which is Pollution Control now and for Barlow Pipeline Company which is a surface disposal put in northwest Lea County so we have been exposed to that work but we deal mainly with ground water or surface water problems in this whole southwest area.

Q. Would you give a brief background of your own educational and professional career?

A. I got out of school in 1947 with a B.S. in Geology and I have worked with major and minor oil companies in West Texas and Southwest New Mexico from '47 to '62 as an exploration geologist and development geologist and since '62 I have done some consulting work in the oil field and have gone into association with Ed L. Reed.

Q. In your association with Ed L. Reed are you called upon to conduct hydrological studies as well as geological ones?

A. Yes, sir, they go hand in hand.

Q. Has your company been employed by Tahoe Oil and Cattle Company in this matter?

A. Yes, sir.

Q. Have you for Ed L. Reed and Associates done the work?

A. Yes, personally.

Q. All right, I'm going to hand you a set of a series of exhibits and ask you to identify each of these. You have before you what has been identified as Exhibit Number Six, will you state what that is and what it reflects in general?

A. Exhibit Number Six is what I call the basic data map. It encompasses about six square miles or seven square miles centered around the hundred-and-sixty acres of Tahoe

Oil and Cattle Company. It's located in Section 2, 20 South, 30 East and the little symbols you see in the various sections are abandoned water wells, lake sites, it is an area that I have personally visited and sampled water or have measured the water level, plus the fact that I have incorporated information from published report, Eddy County Report Number Three, published 1952 and some information from the State Engineer Office of Inventory in 1971.

This map will again tell you the location of these test holes or water wells or sites of examination. It will give you a chemical analysis on these locations, total depth of the water wells or abandoned holes and elevations of the area and whatever published information or information I gathered.

I will go through some of these. Seep No. 1 in the southeast quarter of Section 4 is a seep or I should say a pretty good little flow. I would estimate five to eight hundred gallons per minute heading from the tailing ponds in Sections 4 and 9 flowing toward a lake in the northeast quarter of Section 3. The seep had a total solids of three hundred and sixty-one thousand, four hundred and sixty parts miligrams per liter.

Well No. 2 located in the southeast quarter of Section 3 is an old stock well owned by Mr. Bates at a total depth of sixty feet, the static water level was one point four

feet below ground level, the total solids is twelve thousand, one forty-eight milligrams per liter.

Immediately above location two is a dug water site and its total solids was twenty thousand, one fifty milligrams per liter.

Location Number Four is part of a lake body that encompasses the northwest quarter of Section 3 and its total solids are fifty thousand milligrams per liter. There is an abandoned dug well in the northeast quarter of Section 3, labeled Number Five. It is interesting to note that in 1948 the water level below land surface was minus six feet. Presently that lake level, I would say from judgment by observation is about a plus five feet above ground level.

I also visited Location Number Seven in Section 16 and got a water level. The well is broken down, there is nothing but corrosion in the tanks. They are evidently not used for stock anymore and in Section 8 was another well that the State measured and got a water level of fifty-two feet and the one in 7 was fifteen feet.

I have not sampled the well but in 1950 one of these wells was sampled by the State and I believe the analysis called for about -- in 1950 the total solids were thirty-three, seventy. I do not know what the total solids are today.

Q. Is that on Number Eight?

A. No, Number Seven in Section 16.

Now, generally in measuring thehydrologic gradient from Seven and Eight towards this lake in Section 3, the water movement locally could be going toward the north and from the base of Well No. 9 in Section 25, Hackberry Lake windmill, a water measurement made in 1971 by the State of nineteen point five feet showed a hydrologic gradient to the south and a well in Section 10, 19, 31, measured by the State in 1950 showed a water level of a hundred and one feet and probably typical Triassic water of thirty-three, forty total solids.

That's all the information we could gather in this immediate area other than an industrial well used by the Potash Company in the southwest quarter of Section 4. The water level was eighty-two feet static level in 1960. It is probably a Rustler well with a capacity of a thousand gallons per minute and an estimated total solids of minimum twenty thousand milligrams per liter.

We have some test holes, No. 21, No. 166 and 97 in Section 2 which I will present in a subsequent cross section. However, there is a Well No. 6 in the yellow painted area. It was a well drilled by Mr. Bates back in the early forties to a total depth of a hundred and thirty feet and he was looking for some irrigation water and all he found was ten gallons per minute and he said it was very gyppy water and he

could not use it and he plugged it. This is only verbal information.

Q. You have made reference, I believe, to the lake, dug well in lake, in the north part of Section 3. Can you orient to that where the potash operation is and the tailing commences there?

A. Yes, the tailing pond is immediately west one-and-a-half miles from the Section 2. It is actually in the south half of 4 and the north half of 9, which I can show you better on the next exhibit.

Q. And you did test the solids in that pond?

A. Yes, sir.

Q. Did you give us those?

A. Well, I got it from the seep. It is a seep that is coming possibly from the tailing ponds and from the lakes in the area and the total solids were three hundred and sixty-one thousand, four hundred and sixty milligrams per liter.

Q. All right, I now hand you what has been identified as Exhibit Number Seven which you have before you and I ask you to state what that is.

A. Exhibit Number Seven is a topographic map slightly enlarged from the standard government map. Again the one-hundred-and-sixty acres is marked in yellow in Section 2 and the contour interval on this map is ten feet. The proposed

pit or disposal is in the northwest of that yellow marking at an elevation of approximately thirty-two hundred plus feet. The lake below it is fifteen to twenty feet lower. In my opinion the water would go in that direction.

Q. In other words, if there happened to be an overflow in this dug pit, your opinion is that it would move toward the existing lake?

A. Yes, sir.

Q. You have heard, I believe, since you have been present in the room, questions concerning the risks of an overflow moving down through Sections 10 and 11 to Sections 15 and 16, have you not?

A. Yes, sir.

Q. What is your opinion with regard to that possibility?

A. Well, I feel certain that the water would move downdip and that would be in the direction of the lake to the west that's located in the east half of Section 3.

I would also like to point out the location of the tailing pond again, it's the circular hachured-type insignia, it's in the south half of 4 and north half of 9 and the stippled area west in Section 8 is a lake probably formed from the tailing operation and also there is another little lake in the northeast of 9 and the northwest of 10, which I believe is kind of dammed up from the surface operation.

Q. But the area to which you think water if it over-

flows would move, you are referring to the lake in Section 3, are you not?

A. Yes, sir. I'm talking about surface water at this time.

Q. Yes, I understand that.

Now, I refer you to what has been identified as Exhibit Number Eight and ask you please to state what that is and what it reflects?

A. These drillers' logs, test hole logs, are of public record and the copies are stapled on here and it shows the geology of the area down to five hundred and seventy feet.

Particularly P 21 is located immediately northwest of the proposed disposal site. Now, it has about twenty feet of what we call quaternary alluvium which is some sandy formation with a lot of clay, a little caliche lime. The next hundred-and-eighty feet is of Triassic age, shale with calcareous material in it and a very limited amount of sand carrying a very limited amount of water and from two hundred feet to five hundred and roughly forty feet is the Rustler formation which has mainly Red Bed, some sand zones, approximately a hundred feet of Dolomite with stringers of Anhydrite, which is an aquifer for the area of highly mineralized water.

There is no information on the water in these holes

but I'll refresh your memory in Section 2 where the location 166 is spotted. Mr. Bates drilled Well No. 6, labeled Well No. 6, a test hole and he had ten gallons per minute not deeper than one-hundred-and-thirty feet which would probably check that alluvium section that's pictured here.

So the area has lots of clay awful near the surface except for pockets of alluvium in low depressions and it would be normally mineralized water. The presence of fresh water is very limited to the east of here, probably in the Ogallala formation which does not exist here.

Q. I now refer you to what has been identified as Exhibit Number Nine and ask you to state what that is and what it reflects.

A. Number Nine is a copy from the Ground Water Report Three, Eddy County, New Mexico, 1952. The disposal site is labeled in there north of Highway 180 and east of Highway 31 in the north central part of this map and it is located geologically in the Triassic Dockum formation and the other formation on this plat is the Permian Rustler and Castile which is located west. There is no Ogallala in this area which is Tertiary.

Q. What does that mean in terms of the possibilities of the existence of any fresh water?

A. Well, this is a very general area but the area

around the disposal site, I found no fresh water or potable water or even cattle water, which I will go into a little later on.

Q. Now, I refer you to what has been identified as Exhibit Nine-A and ask you to state what that is and what it reflects.

A. Exhibit Nine-A contoured on top of the salt beds, it is a sub-surface contour map covering the area in question again and it is a reproduction from Report Number Three, Eddy County, New Mexico, 1952 publication. The salt formation in this area in Section 2 is approximately five hundred feet and immediately north there is a deep depression of approximately a two hundred foot drop showing the area having the salt slumps and the possibility exists that very little or no water will be getting out of this slump area.

Q. Now, I refer you to what has been identified as Exhibit Ten and ask you to state what this is?

A. Number Ten is a Historical Chemical Quality listing of the Clayton Well No. 2 which is located in the northeast quarter of the southeast quarter of Section 3, Township 20, 30 East, Eddy County.

We have the dates, specific conductance and a breakdown of all various chemical qualities in milligrams per liter.

The two columns I want particularly to pay attention

to are the chlorides and the total dissolved solids. Now this is ground water. On May 1st, 1950, Well No. 2, which I talked about earlier, the water level right now is one point four feet below ground level. The chlorides were two, fifty-five milligrams per liter and the total dissolved solids were twenty-nine, thirty, which is slightly above human consumptive recommendation but probably adequate for animals, stock.

Now, the subsequent times and chemical analysis were furnished to us by the Potash Company of America who have come to this particular well and sampled this periodically and this is their findings, this is their chemical analysis.

As you have noticed, the chlorides are progressively increasing in time and total dissolved solids.

Then turning to the next page, in June 23, '76, I personally sampled that well and examined the chlorides at the laboratory where the analysis showed fifty-four hundred and thirty-six milligrams per liter of chlorides and total dissolved solids of twelve thousand, one hundred and forty-eight milligrams per liter.

The following pages are the analysis made by Southwestern Lab and the Potash Company of America.

In my opinion, twelve thousand, one hundred and forty-eight ground water is above the accepted water for cattle, animal life.

Q. Now, I refer you to Exhibit Eleven and ask you to state what that is, please?

A. Exhibit Number Eleven is a hydrograph which measures the static water level in a particular well over a period of time. This gives you an idea of what is happening to the water level. Normally it goes down because of use in the area. This Well No. 2 is the one I just read the chemical analysis of and it is very close to this lake and located in Section 3.

A water level recorded in 1950 by the State showed the depth of the water to be eight-and-a-half feet below ground level. In 1960 Mr. Bates who had installed equipment in the hole told me that he knew the water level to be nine feet below ground level and in 1968, a few months after that, the State measured that and came up with a water level of three point six feet below ground level and the State measured it in 1971 and again came up with a water level of about one point nine feet below ground level. I measured the same well in June of '76 and the water level was one point four feet below ground level, which in my opinion, shows that the influx of water from the area had increased the ground water roughly eight to nine feet in the last twenty-six to twenty-seven years.

Q. Where do you think that water is coming from and what would the quality be?

A. Well, I believe most of this water could be coming from the potash operation, possibly some rainfall and, well, we know the quality of this particular well. Presently the total solids are twelve thousand, one forty-eight.

Q. I refer you now to Exhibit Twelve, the last exhibit, and ask you to state what that is and briefly what it reflects?

A. Exhibit Number Twelve is a Composite Chemical Analysis of Produced Water in the General Area of Section 2, 20 South, 30 East. This information was obtained from "The Oil and Gas Fields of Southeastern New Mexico", a publication by the Roswell Geological Society, Volume 1956 and 1960, plus other reputable sources.

The first column shows the formation which is of the different horizons of produced oil and water in the area and this is primarily dealing with the water: Yates, Seven Rivers, Queens, Premier, Grayburg-San Andres, the Delaware Sand, Bone Spring, Abo, Wolfcamp, Strawn, Atoka, Morrow and Devonian.

The column next to it is the Total Dissolved Solids, again it is the factor we are dealing with primarily and they range from roughly thirty thousand parts per million to in some cases as much as three hundred thousand parts per million.

Q. How are those relevant to potable and non-potable

water?

A. Well, all of this is above. Potable water, in most instances, five hundred to a thousand total solids is accepted for human consumption and up to ten thousand total solids for animal life.

Q. Are there any other particular references?

A. Well, the Morrow sand I believe is the target of Tahoe Oil and its total solids is sixty-one thousand. The lake presently shows fifty thousand, the lake sample.

Q. Now, were all of these exhibits prepared by you or under your supervision?

A. Yes, they were all prepared by me.

MR. CAMPBELL: I would like to offer these exhibits in evidence.

MR. NEAL: No objection.

MR. MADDOX: No objection.

MR. STAMETS: These exhibits will be admitted.

(THEREUPON, Applicant's Exhibits Six through Twelve were admitted into evidence.)

MR. CAMPBELL: I have only about two or three more questions, short ones, for this witness and he will be ready for cross examination. I don't know what the intention of the Examiner is, shall I go ahead and finish with him?

MR. STAMETS: Go ahead and finish with him and then we will break for lunch.

Q. (Mr. Campbell continuing.) Now, based upon the studies that you have referred to here and the data that you have collected and the analyses that you have made, do you feel that you have adequate information upon which to base a professional opinion as to the water situation in the area that you have described here in which the proposed facility would be operated?

A. In this immediate area I have adequate information.

Q. Would you express that opinion with regard to the fresh water versus non-fresh water, humans and animals and so forth?

A. The lake located in the northeast quarter of Section 3 had a minimum total solids of fifty thousand, which is unfit for animal or human and the ground water as found in Well No. 2 has total solids of twelve thousand, one forty-eight which again is unfit for human or animal life.

Q. Do you believe that with your knowledge of the situation in the area that this installation would significantly affect either the water supply or the quality of water in the immediate area we have been talking about?

A. I don't think it will affect anything.

MR. CAMPBELL: That's all of the questions.

MR. STAMETS: At this time we will take a recess until one-fifteen.

(THEREUPON, the hearing was in recess.)

AFTERNOON SESSION

MR. STAMETS: The hearing will come to order.

Do you have anything further from this witness, Mr. Campbell?

MR. CAMPBELL: Not at this time.

MR. STAMETS: Any questions of the witness.

MR. NEAL: Yes, sir, I have a few questions.

MR. STAMETS: Mr. Neal.

CROSS EXAMINATION

BY MR. NEAL:

Q. Would you direct your attention to Exhibit Six in which you have testified as to the various wells that you have inspected and the total water levels, is that correct?

A. Yes, sir.

Q. Now, comparing that with Exhibit Seven, the Potash Mine Company of America lake lies over immediately west in a portion of Section 8 and Section 9, does it not?

A. Yes, sir.

Q. And it also has another lake that is up in Section 3, I believe, isn't that correct?

A. Yes, sir.

Q. Now, isn't it true or did you observe, I understand that you were on the premises, did you observe up in 3 that the Potash Company had constructed a barrier or dike in

regard to water flowing to the southeast down this draw.

A. No, sir, I haven't investigated all of that.

Q. You didn't look at it that close and you don't know?

A. No, sir, I just went down this road to the water well.

Q. You didn't go over and look at their facilities then as to what they had constructed there?

A. No.

Q. Now, directing your attention to Exhibit Seven, in Section 15, did you drive down in that area?

A. In 16 only.

Q. You did not go over into 15?

A. No, sir.

Q. Isn't it a fact, if you know, that in 15 there is a draw that comes through there that is quite marshy?

A. From the topographic map I am observing that.

Q. And that would indicate that on the map, wouldn't it?

A. Yes, sir.

Q. Now, I'm directing your attention directly west to a round circle of the marshy area in the northeast of 16, did you go to that spot there?

A. No, sir.

Q. Do you know that that is a watering for cattle?

A. No, sir, I haven't been to that location.
Q. So, therefore, you couldn't take any samples there?
A. No, I didn't.
Q. Were you aware that there was any water there?
A. No, sir.
Q. You have done work for Mr. Squires before, your company?
A. My company, yes, sir.
Q. And in connection with further to the east?
A. Yes, sir.
Q. And you also knew that this ranch is being operated by Mr. Squires?
A. No, sir.
Q. You did not know the owner?
A. No, sir.
Q. Did you make any investigation as to who owned it?
A. No, sir.
Q. Did you observe the headquarters of this ranch approximately a mile to the west of the road there, down in a draw?
A. Yes.
Q. Did you go over and contact the ranch foreman?
A. No.
Q. Did you contact anybody on that ranch concerning the various cattle waterings in this immediate area?

A. No, sir. I talked to Mr. Bates and he told me where they got the cattle water from.

Q. Mr. Bates' ranch lies to the north, does it not?

A. Yes, sir.

Q. Now, in regard to these elevations or water levels that you have testified to, where is the source of that water coming from; why are those water levels coming up?

A. They seem to be coming up because of the influx of water into Section 3.

Q That would be from the lake of the Potash Company of America?

A. Yes.

Q. And that would be underground seepage, would it not, underground movement?

A. Yes, sir.

Q. And that underground movement running from the northeast of 3 in a southeasterly direction or a south direction?

A. In that location it is going southeast, it's rising.

Q. And that would materially affect, would it not, the Sections 10 and 15 and Section 16?

A. Possibly.

Q. Probably?

A. Yes, I haven't checked anything on those sections.

Q. But the water is coming and moving to the south or southwest?

A. The water is just rising underground in all directions.

Q. All right and the principal source of that water, is it not, is from Section 3 or the lake over in Section 8?

A. Yes, sir.

Q. Now, did you inquire into the past history of these ranches as to the Clayton well which is shown on your Exhibit Seven?

A. No. 2 or 3?

Q. I believe it's up in No. 3, it's number 5, I believe.

A. 2 and 5 are called Clayton wells by the State.

Q. Right and isn't it true that at one time that was the principal watering place for the Bates ranch?

A. Yes, sir.

Q. Do you know whether or not that's on the Bates ranch or the Snyder ranch?

A. Well, we did not survey that location and Mr. Bates said it belonged to him so I assumed that was his.

Q. And the cattle used to water there all of the time?

A. Yes, sir.

Q. But there is a definite relationship between the lake in Section 3 and in Section 8 as to the water table that is existing down in Section 15 and Section 16, there is a

definite relationship, is there not?

A. I believe there is.

Q. Now, what is there in Section 2 that will stop water that is being placed into a proposed pit also from migrating to the south and southeast?

A. Nothing.

Q. In other words, it's going to seep, it's not going to be a straight evaporation pit, is it?

A. Mostly it is evaporation but there could be some downward migration, true.

Q. There will be a substantial part of it, will there not?

A. Not necessarily.

Q. Have you made any figures as to the amount of acres or gallons that can evaporate daily, assuming that you had three hundred and sixty-five days a year that would be the same?

A. Yes, sir.

Q. And what does that figure out?

A. I believe it is about two-and-a-half inches a day evaporation.

MR. STAMETS: Excuse me a second, I would like to clarify that. I believe the first witness said eighty inches a year and for three hundred and sixty-five days, I don't believe that's going to work out to two-and-a-half inches.

THE WITNESS: It won't? One point nine or something.

MR. STAMETS: Eighty inches a year, if you divide eighty by three, sixty-five I don't think you would get one.

THE WITNESS: Point two four, I'm sorry, point two four. He did the figuring and I just repeated what he told me.

Q. (Mr. Neal continuing.) You haven't made the calculations yourself then?

A. No, I observed it and I must not have observed the decimal.

MR. NEAL: In other words --

MR. CAMPBELL: He'll be available.

MR. NEAL: I understand, so we will just call him back in a minute.

Q. (Mr. Neal continuing.) All right, now, there will in your opinion be seepage from this pit to the south and southwest down in, as reflected on this map, 15 and 16?

A. Yes, sir.

Q. Okay. Have you had an opportunity, as a matter of curiosity, to do any work of this nature over in Sections, about 13 or 24, in the area of the Duvall Potash Mine?

A. No, sir.

MR. NEAL: I'll pass the witness.

MR. STAMETS: Are there other questions of the witness?

MR. MADDOX: Just a few.

CROSS EXAMINATION

BY MR. MADDOX:

Q. Are you aware of the location characteristics of the Laguna Gatuna and Laguna Plata lakes?

A. I've read over the report but not in detail.

Q. But your firm studied that area?

A. Yes, sir.

Q. Do you know the approximate size of those lakes?

A. Yes, they cover more than a section. They are very large.

Q. And, therefore, in your opinion would they hold almost unlimited amounts of water under those circumstances?

A. Yes, sir.

MR. MADDOX: No other questions.

CROSS EXAMINATION

BY MR. STAMETS:

Q. I would like to get back to the evaporation rate. What is the evaporation rate in this area?

A. Well, I have not really checked on that.

MR. CAMPBELL: Could we use the other witness? I'm going to call him back if you don't have any objection to that, the engineering witness, he has the data.

MR. STAMETS: Okay, I'll tell you what --

MR. CAMPBELL: Oh, you need it to follow through?

MR. STAMETS: Yes, I need this to follow through so why don't we just go ahead and go back and ask the original witness about that and he may answer from his seat.

Where did this evaporation rate come from and what is it?

MR. FREEMAN: This is based on information from the Carlsbad weather information where they say that the annual evaporation rate is between eighty to eighty-five inches per year.

MR. STAMETS: Eighty to eighty-five inches a year. You say the Carlsbad weather service, is this the U. S. Government office there?

MR. FREEMAN: Yes.

MR. STAMETS: Okay, now, if I convert that eighty inches a year what does that come out to a day?

MR. NEAL: I got point zero one eight.

MR. STAMETS: Point zero one eight.

MR. NEAL: That's the acre foot a day.

MR. STAMETS: I did just a little bit of calculating during the lunch hour and if anybody disagrees with these figures let me know. The surface area of the pit is about one acre or forty-three thousand, six hundred and some square feet. Eighty inches a year, I divided that by

twelve, I got six point six six feet. I multiplied the surface area by six point six six and I came up with a figure of two hundred and ninety-one thousand plus cubic feet of evaporation from that pit in a year. One barrel of water is about five point six one five four cubic feet and I divided that figure into two hundred and ninety-one thousand and got an evaporation rate of a hundred and forty-two barrels a day, more or less.

Does anybody disagree with those figures?

Now, if the evaporation rate is a hundred and forty-two or a hundred and fifty barrels of water a day what is going to happen to the other eight hundred and fifty barrels of water a day?

MR. FREEMAN: We have asked for this ten-acre area and if the evaporation does not take place we were going to put up in essence a fire wall type installation and then that would be increased times a factor of ten. Either that or we have got to cut back the amount of water that will actually evaporate. I feel that more water will evaporate than that but that is the actual figure that the Weather Bureau has given us.

MR. STAMETS: I better quit asking this witness questions, I would like to get back to Mr. Skrabacz.

Q. (Mr. Stamets continuing.) Did you make any study of the amount of rainfall in this particular area?

A. In general only.

Q. In general only, what did that come out to?

A. Well, I just know generally. I thought it was about twelve to fourteen inches a year. I did not make any studies.

Q. What happens to this rainfall, where does it go?

A. Towards the Pecos River.

Q. In other words, what we are talking about right here in this area that's under consideration here today, the water that falls in this area goes to the Pecos River if there is enough of it?

A. Yes, towards the River, correct.

Q. And then the same thing would be true of the water from this PCA lake, would that go to the river as well?

A. If it's not dammed, I guess, it's a lesser elevation. I believe the river's elevation is about -- I don't have it here, I really don't have the elevation of the river but I imagine it is lower.

Q. In other words, in general the sub-surface drainage in the area is towards the Pecos River.

A. Are we talking about subsurface or surface?

Q. Let's talk about the surface first.

A. Well, generally the surface is lower at the Pecos River.

Q. Okay. Now, I see on your Exhibit Number Seven that

there are some closed drainage basins. Let's take for example in Section 11, it looks like there is a low spot right near the center of the section. Now, would the water there drain into that low spot?

A. Locally, yes.

Q. And then up in Section 3, what has been identified as the Clayton wells there is a large depression, surface water would drain into there?

A. Yes, sir.

Q. Now, let's talk about subsurface water, where does it go?

A. Well, generally overall and on a regional basis it would go towards the Pecos River to the southwest.

Q. So, it would follow in general the surface drainage as well?

A. Yes, sir, that is correct.

Q. Now, when you were in the area did you observe any surface fracturing resulting from secondary mining in the PCA mine?

A. No, sir, I just drove across this road here and picked up samples from the various wells. I did not observe any fracturing on the surface.

Q. Did you make a detailed study of this area, commonly known as the Nash Draw-Clayton Basin area?

A. No, sir.

Q. So you would not be able to testify in a general nature what the water system here, where the normal flows are from and to and what happens to the water on its way to the Pecos?

A. No, sir, not in general other than what I've read in the State Engineer's report. Locally I made this study pertaining to Section 2, 3, Section 16 and right along the highway there in Section 4. That's where I picked up the samples and measured the water levels and that was the end of my study for that area.

Q. Did you make any study to determine how impermeable a pit would be located in Section 2?

A. No, sir, no clay studies, I just observed it. It is very red clay.

Q. So you wouldn't be able to tell what type of percolation was there?

A. Percolation and permeability, no, sir.

Q. Let's just make some assumptions here for the purposes of study. Let's assume that eight hundred and fifty barrels of water a day would percolate out the bottom of this pit, where would that water go?

A. Gradually towards the Pecos River.

Q. Now, could that be mixed in with the natural rainfall in the area and cause contamination of that water to a greater degree?

A. Contaminate the natural rainfall?

Q. Yes.

A. Yes, sir.

Q. Okay, now, we have made this assumption, let's go back to the real world. Can you tell us that this will or will not happen?

A. Well, if the brine water percolates into the formation, eventually it would move toward the Pecos River.

Q. But can you tell us whether it will percolate from a pit in this area?

A. I say that a small portion of it possibly would. I have not made any detailed clay studies.

Q. Did you recommend the size of the pit?

A. No, sir, I had nothing to do with that.

Q. Referring to Exhibit Number Nine which is a map from the Ground Water Report Number Three, did you read the contents of that entire report?

A. Yes, I have, generally.

Q. Did that report indicate that water could be found in the Triassic in parts of Eddy County?

A. Yes, sir.

Q. What about this general area?

A. There are waters in the Triassic sands, definitely.

Q. So somehow or another waters have gotten into the Triassic which is shown here on your Exhibit Number Eight?

A. Yes, sir.

Q. Below the surface sands?

A. Yes, there are some waters. I said in that exhibit there was no mention of water but I'm sure there is water there.

Q. If water is added to this system that we have here where water flows to the Pecos River, subsurface or on the surface, if water is added to that system where will it go, to the Pecos River?

A. Yes, sir.

Q. Is it your opinion that we would add to the sum total of water entering the Pecos River at the Malaga Bend area?

A. Yes.

Q. And if that water is of poorer quality than the Pecos River what will that do?

A. It will make it poorer.

Q. Now, there was an exhibit somewhere here that listed a lot of different waters and the contents?

A. The brine waters?

Q. Yes, is that Exhibit Twelve?

A. Twelve, yes, sir.

Q. Okay. Do you know if this water is generally better or poorer than the Pecos River water?

A. Well, I don't think the Pecos River is of this

mineralization at all. I don't know offhand because it varies as it goes along. I don't know offhand what the Pecos River solids are.

MR. STAMETS: Any other questions of this witness?

MR. CAMPBELL: Yes, I have a couple.

REDIRECT EXAMINATION

BY MR. CAMPBELL:

Q. You have testified that the water that might be added by this installation if it flowed over the surface southward or if it flowed subsurface southward would add to the volume of water that is moving that direction toward the Pecos River underground. To what extent do you think this operation would impact the already existing situation in the area?

A. Well, if the surface would go toward a lake there would be no problem at all and the ground water in the immediate area is highly mineralized now.

Q. Haven't you testified that if it was on the surface under the present circumstances it would go to the lake in Section 3?

A. Correct.

Q. Now, what I'm trying to get at is if you have an opinion with regard to the magnitude of the impact of this facility on the general situation in that area, is it

significant, is it minimal, what is your opinion as to that?

A. I think it's minimal right now.

Q. Do you believe that there are ways in an engineering sense that the direction of the flow can be affected?

A. Correct, on the surface.

Q. On the surface.

MR. CAMPBELL: Well, I'll ask the engineer this other question. That's all I have.

MR. STAMETS: Mr. Neal.

RECROSS EXAMINATION

BY MR. NEAL:

Q. The surface work would involve lining of the pit or something of that nature, in other words, where it could not seep down?

A. Yes.

Q. That could be done?

A. Yes.

Q. And the dikes could be built around to take care of any overflow or anything of that nature?

A. Yes, sir.

Q. And that would limit the effect of any adverse effects on further downstream or down to the south?

A. On the surface, yes, sir.

Q. And if you had the pit lined to where there could not

be any seepage then it would not be compounding the problem that is already there, would it?

A. No.

MR. NEAL: Thank you, sir.

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

(THEREUPON, the witness was excused.)

MR. CAMPBELL: Do you want me to call the engineer back for your benefit?

MR. STAMETS: Yes, if you will bring him back to the stand.

MR. CAMPBELL: All right, Mr. Freeman, will you take the stand again, please?

I'll ask him a couple of questions, Mr. Examiner, on rebuttal here, I guess.

KENNETH FREEMAN

recalled as a witness, having been previously sworn, was examined and testified as follows:

REDIRECT EXAMINATION

BY MR. CAMPBELL:

Q. Mr. Freeman, you have been present here and listened to the testimony and the questions and the answers, have you not?

A. Yes, I have.

Q. And you are aware that there is a concern on the part of one of the parties to the proceeding that surface and underground movement may take place that could adversely affect the water situation in Sections 15 and 16 and that there has been a broader areal discussion of the impact farther to the south to the Pecos River, you have heard that, have you not?

A. Yes, I have.

Q. Now, from an engineering point of view, this is a legitimate and substantial concern of the Commission when weighed against the waste disposal problem and the requirement for doing something with waste somewhere. If that is a serious problem can the area be engineered in such a way that the chance of the surface -- first, movement could be minimized or could be directed more clearly and definitely toward the lake in Section 3, for example?

A. Well, the original plan was to construct a three-acre pond and it has been decreased to one acre because of the amount of water we felt that the evaporation would be higher. However, it has also been considered to put a dike or a fire wall around this ten acres that is located on the northwest corner of this hundred-and-sixty acres and if there is high rainfall and so forth, this would contain the water into this ten acres.

Q. Completely contain it or direct it somewhere else, could it be done either way?

A. Well, the thinking was we would like to have a three-foot wall pushed up on three sides and then as it dips towards the west to the lake that could be two-foot so if there is any overage it would go to the lake.

Q. Well, in answer to my question you are saying that there are engineering ways in which this matter could be addressed in terms of the construction of the facility and the general location?

A. Yes, there are.

Q. To address the question of the underground possibilities, do you as a petroleum engineer have any personal knowledge or opinion as to the possibilities of seepage, either whether or not it will occur or at what rate it will occur with the storage of this water in the pit you are proposing, do you have any opinion as to that?

A. No, I really have no opinion other than the fact that from this hydrograph the water level is supposed to be one-and-a-half foot or something like that from the surface and this was the reason for the pit not being any deeper than what it is.

Q. Well, but you are saying that you don't know what the seepage would be, if any, into the underground basins?

A. Yes, that's what I'm saying.

Q. Now, if the Commission believes that there might be or is concerned that there might be significant underground seepage that could then move inexorably, I guess, with the rest of this gluck that's in that area down toward the Pecos River and that a lining would at least alleviate some of the concerns about that, would you have objection to lining this pit?

A. No, it could be lined and I know that the Commission in previous orders has set out approved methods of lining.

Q. Do you know what the cost of those would be?

A. I do not know that. This would have to be considered.

Q. But obviously if the Commission required it you would either do it or not go ahead with the project?

A. Yes.

MR. CAMPBELL: All right, that's all of the questions that I have right now.

MR. STAMETS: Are there other questions of Mr. Freeman?

MR. NEAL: I would like to ask one question.

RECROSS EXAMINATION

BY MR. NEAL:

Q. From your earlier testimony, when this water is put into the tanks and then the water drains off into this holding tank or pond, isn't it true that in those type of

systems that you sometimes develop, depending on the quality of the water mixed with oil, that you develop a skim, oil skim across that holding pond, isn't that true?

A. Not if you are running a good operation it isn't. They have chemicals that you can add to the water that will break the surface tension so the oil will separate from the water and if you are starting to notice this you will add chemicals so it will break out.

Q. Is it true that if a skim does occur on this holding pond that this materially affects the evaporation, does it not?

A. That would be true.

Q. In other words, whether or not a skim gets out there, you will control that by chemicals?

A. Yes, if you would notice any then a prudent operator would treat the system so that the oil would break out.

Q. And that would require, would it not, daily attention?

A. Yes.

Q. Do you intend to have someone on the premises here all of the time?

A. We are intending to employ a person, yes.

Q. That's to keep your records as to how much water is going to be going in?

A. For the trucks coming in, et cetera, to make sure the tickets are signed.

MR. NEAL: That's all.

MR. MADDOX: I have no questions.

RECROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Freeman, getting back to the evaporation rate. Now, if the eighty inches a year is correct and you can only evaporate a hundred and fifty barrels of water a day, would you be able to build a pit of sufficient size on those ten acres to handle all of that three thousand barrels?

A. If those numbers are correct, no, sir.

Q. Have you done any study on the permeability of the material there that the pit would be constructed out of?

A. You mean like the various linings?

Q. No, of the natural material.

A. All I have seen is the core analysis that says that this upper part is high in clay contents, it's a sandy clay which usually the clay will tend to swell and seal off has been my experience.

Q. But as far as this particular size is concerned there are no tests, no scientific analysis as to permeability or impermeability?

A. No, there are not.

Q. You could not state at this time as to whether this would be an impermeable pit?

A. No, sir, I could not testify to that.

Q. If a pit lining were required and was within the realm of financial possibility, I presume that would be put in in accordance with the Commission order, one of the 3221 orders, B or E. If a lining were required would you be agreeable to installing a lining in accordance with that particular order?

A. Yes. Our position on this is, if a lining is required we will have to make a cost setting, what it will be. Probably we will ask at that point, if we are going to do it, for a three-acre pit to be lined so it would increase our evaporation rate and work the costs out on that basis and if at that point it is just an economic situation whether we would do it or not.

MR. STAMETS: Any other questions of this witness? He may be excused.

(THEREUPON, the witness was excused.)

MR. CAMPBELL: I don't have any other witnesses. I would like to make a statement at the conclusion of the other statements and the other witnesses.

MR. STAMETS: Are you going to put a witness on, Mr. Neal?

MR. NEAL: Yes, I would like to put Mr. Squires

on for a few minutes.

LARRY C. SQUIRES

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

DIRECT EXAMINATION

BY MR. NEAL:

Q. State your name, please?

A. Larry C. Squires.

Q. What is your business or profession?

A. Professionally I'm a veterinarian, I'm engaged now in operating the Snyder Ranches, which has some ranches in Lea and Eddy County.

Q. And you are a licensed veterinarian in the State of New Mexico are you not?

A. Yes, sir.

Q. Now, you have been present during this hearing all morning, have you not?

A. Yes, sir.

Q. Now, directing your attention to Applicant's Exhibit Number One, the Snyder Ranches is the owner and operator of a ranch that one of the north boundary lines is across Sections 15 and 16, I believe that's Township 20, 30, Sections 15 and 16?

A. Yes, that's true.

Q. Then does the ranch proceed in a northerly direction up to Section 3?

A. Yes.

Q. The property in which this application is made is operated by Mr. Les Bates, is it not?

A. Yes.

Q. Now, directing your attention, Doctor Squires, to Exhibit Seven, will you tell the Commission, the Examiner, where the waterings are on the Snyder Ranch that are being used?

A. About the only watering we have for cattle in the immediate area is circled right -- well, it's this little sump right here in Section 16, in the northeast quarter of Section 16. Then, of course, as it has been testified earlier there is a windmill down on the road about a half-a-mile south of there. This windmill has been shut off. We are just about out of water in this area because of pollutants of, industrial pollutants. The water that we do have and is being used there, cattle do drink this water, it tastes pretty bad but cattle do drink it and that's in this area here in 16.

Q. Would you explain to the Commission on the same exhibit, there is a darker, closer contour, the surface conditions as exist there to the east of the watering?

A. Well, over in Section 15 there as indicated earlier, this water that is standing along the road and these sump areas along there in 15, cattle don't drink this water, they don't drink that water at all. It is real marshy and some days there will be a lot of water standing there and the next day it will be just wet and the next day there may be six or eight inches of water there. We do find in our areas when we get our normal rainfall, twelve to fourteen inches, that's a little above normal really, but if we do get this much rainfall, this spring we pointed out in 16 does get much better, the quality of the water does get much better.

MR. STAMETS: The spring in Section 16, where is that located?

A. It's right up there in the northeast quarter.

MR. STAMETS: That low spot up there?

A. Yes, right. This pasture is called spring trap and this mill has been called spring mill forever.

MR. STAMETS: That would be a very shallow spring rather than a deep up-welling of water?

A. Oh, yes, it's a -- well, it's a lower area that has got water in it that the cattle drink and it has been called a spring for years.

MR. STAMETS: Is it a spring or just a tank --

A. It's just a hole full of water that cattle drink. They don't do real good on it but they drink it and the reason

they do drink it is because they are forced to. If they had any good water, quote good water, in the area they would not drink this water but they are forced to it and they do survive and they do produce minimal on this water. I wish it were better water but it isn't but it's all the water we've got and we would hate to see anymore salt put in it.

Q. (Mr. Neal continuing.) Now, proceeding in a northwesterly direction from the marshy area, there is a draw that proceeds up towards the Potash Company of America lake when you are actually on the surface out there on the premises?

A. Well, yes. Actually there is a hill between there and the water seems to go underground and come up down here in 15 really.

Q. And that is also up in the area of Section 2 where this proposed location is?

A. Yes.

Q. Do you have a strong feeling, Mr. Squires, that any pit that is placed in Section 2 would cause a seepage to the south and southwest down to 15 and 16 on your ranch?

A. Yes, obviously I do because that's why I'm here. We have experienced and our ranch covers quite a bit of area between the PCA mine and Duvall mine in this immediate area and since the Commission's order, an exception to allow surface disposal of water in that area we have approximately

five water wells, including this one that the gentleman testified earlier had been shut off, that have gone bad in the last five years and we cannot use them at all. We feel like it's a combination of potash waste and oil field waste and we are in the process of trying to do something about it. If the Commission had jurisdiction of the potash mine we would have already been here but we have to seek other areas there to fight this pollution.

Q. Now, there was earlier reference and earlier testimony of your obtaining Mr. Reed and Associates for work here a few years ago. Would you explain to the Commission the circumstances under how that came about?

A. Well, yes, back over at the Laguna Gatuna and the other salt water disposal lakes that have been brought into this prior to this. My interest in this was purely from a landowners and ranchers point of view. Originally there were some businessmen and independent producers in the Lea County area at about that time that were on the ground looking for some lake to dispose of brine water in and I decided that if there was any water going to be disposed of on these ranches I was going to have an active part in it and to see that it was done where it would not pollute any water. This is my reason for coming before the Commission originally and seeking to get these salt lakes exempt from the order because I hired Mr. Reed and Associates to study the area. They assured

me that it was a natural basin, that there was no outward flow from the area. They will hold millions of barrels of water. Actually they are two or three sections in size and six to eight feet deep which will hold a lot of water which will give it some room to evaporate. And since I got this order I sold my interest in this to other people, I retained part of it.

Q. But the original intent of going in was to ascertain whether or not there would be any water pollution of water on the ranch?

A. That is entirely correct. We are primarily ranchers and we wanted to protect the water that was in the area.

Q. And that's your reason for appearing here today?

A. That's my reason for being here today.

MR. NEAL: Pass the witness.

MR. STAMETS: Any questions of this witness?

MR. CAMPBELL: I have a couple of questions.

CROSS EXAMINATION

BY MR. CAMPBELL:

Q. Mr. Squires, you stated that you were instrumental in arranging for the use of the disposal area, I guess now owned by Pollution Control, Inc., one of the protestants in this case?

A. Yes.

Q. Was it originally yours, was the permit issued to you?

A. The permit was issued to me personally.

Q. When was that?

A. I don't remember, it has been five or six years ago.

Q. And when did you dispose of your interest?

A. Soon after that. I don't recall offhand but it was soon after that.

Q. What did you retain, what interest do you have?

A. Twenty percent.

Q. You have twenty percent interest in the entire activity of Pollution Control, Inc.?

A. Twenty percent of the bills and profit.

Q. And the profit, is that correct?

A. That's correct, twenty percent of the liability.

MR. CAMPBELL: I think that's all.

MR. STAMETS: Any other questions of this witness? He may be excused.

(THEREUPON, the witness was excused.)

MR. NEAL: We have nothing further to offer, Mr. Stamets.

MR. CAMPBELL: I wish to make a statement but I want to follow and close, if I may.

MR. STAMETS: You may make your statement last.

MR. CAMPBELL: Thank you.

MR. MADDOX: I just have a short statement on behalf of Pollution Control, Inc. I think there is evidence in the case as to the position of Pollution Control and its operators and the two natural facilities to dispose of salt water and it is our position very simply that the obligation of the Commission under the Statutes is to conserve oil and gas in New Mexico and also to regulate the disposition of water produced or used in connection with drilling or producing of oil or gas or both on the surface and subsurface in such a manner as to afford reasonable protection against contamination of fresh water supplies as designated by the State Engineer. It is apparent from evidence presented in this case that there is a risk and there is also in the evidence in the case and in the order with the Commission that there exists a massive almost unlimited capacity facility in this immediate area that has been approved and exempt from the rules that is operated by Pollution Control that will fulfill the Commission's obligation in conserving oil and in being able to dispose of this water also consistent with the reasonable protection against contamination and for this reason and the other evidence presented in this case we would submit that the Commission reject the application tendered by Tahoe Oil and Cattle Company.

MR. STAMETS: Mr. Neal.

MR. NEAL: Well, aside from Pollution Control, I think that the critical statement made by Snyder Ranches that we are ranchers and even though Mr. Squires himself has some interest in Pollution Control, this area is our primary concern because we are ranchers.

Now, I'm not under oath but I have been out on that ranch for many years.

MR. CAMPBELL: There is nothing there, you are testifying without being under oath.

MR. NEAL: You know, I learned that from a real good teacher, Mr. Campbell.

But anyway, there is a definite, even under the testimony that has been introduced here, there is a definite situation by which there will be seepage from this proposed location down onto the Snyder Ranch. It will affect not only the surface water from the rains, it is possible that it will affect the subsurface water.

Now, if this permit is granted whereby the acreage is maintained and where there is an adequate safeguard for the surface so contamination could not occur or whereby the pits are lined where there will be no seepage, then obviously we have no concern because then it will not affect us.

The way it is proposed to be constructed directly affects us and we object thereto and if it is going to be

constructed without any restrictions we ask that it be denied.

On the other hand we are not trying to stop free enterprise or anything else. If the man will construct the facility where it will not affect us, that's fine but put the safeguards in where it will not affect us, that's what we are asking for.

MR. STAMETS: Mr. Campbell.

MR. CAMPBELL: Mr. Examiner, I'm not going to testify, I'm going to make a very short speech.

This question of the disposal of waste of all kinds and by the very nature of resource development and use we humans produce unbelievable amounts of waste at home and everywhere else and somehow or other it has to be disposed of and recently environment for disposing of waste has become a very, very difficult one, something we all wish would go away and consequently we just resist any kind of an effort to eliminate the problem or at least minimize it.

I dare say, though I don't know, but I dare say that if the hearing on the Squires' application five or six years ago were held today that, you know, the same kind of questions, maybe differently framed, would be under consideration here.

There is no way to dispose of waste without creating some kind of a problem and the question is the trade offs. The question is the cost and benefits, the question is, how

do we do it in the least harmful way and still retain some degree of economic sense about it. It was our position and it is our position that this area, this immediate area is admittedly clearly already seriously, probably irretrievably contaminated. There is no way you can restore the fresh water in the immediate area of this facility and that furthermore the experience that we are getting with underground disposal through injection wells is a terrible worry if not a disaster and that the disposal on the surface is the soundest way to do it provided whatever safeguards the Commission requires are complied with and we are prepared to comply with those.

If this Commission believes from this evidence that there is a sufficient danger to justify the economic cost we are prepared to examine that and hopefully it won't eliminate the facility. If engineering-wise we can either work with the Commission or with the ranchers to eliminate, if possible, the chance of surface migration we will do that but we filed a good faith application here, we know, although we didn't feel it appropriate here to talk about our market examination, we didn't feel that it was relevant but we wouldn't be spending the money if we didn't feel there is a market here so I think it is a matter of the Commission coming to task with this serious question of how do we dispose of the waste and what are the least harmful ways to do it because you

can't sweep it under a rug somewhere and it will go away and how can you do that in the best interest of the ultimate recovery of the oil and gas, the protection of the ranchers, the protection of the fresh water for other uses and we are conscious of that, we are prepared to cooperate with this Commission in any way we can within economic limits to bring that about and to make a contribution I hope, to the disposition of these wastes in the oil and gas areas of New Mexico.

MR. STAMETS: If there is nothing further this case will be taken under advisement.

REPORTER'S CERTIFICATE

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

Sidney F. Morrish, C.S.R.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 5709, heard by me on 8/16, 1972.

Richard L. Stamets, Examiner
New Mexico Oil Conservation Commission