NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

Hearing Date APRIL 16, 1986 Time: 8:15 A.M.

NAME	REPRESENTING	LOCATION
Karen Aubrey	Kellahin + Kellahin	Santa Fe
Paul W. Burchell	El Paso Natural Gas Co	El Paso, TX
Bob Hubbell	Byram	Santa Fe
Harold Stamm	OCD	S.F.
Jim Bruce	Hinkle Law Firm	Santa Fe
Dan Nutter	Conoco Engr	Santa Fe
Michael Stogner	OCC	Santa Fe
Eddie Seay	OCD	Hobbs
Evelyn Downs	OCD	Hobbs

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

16 April 1986

DIVISION HEARING

IN THE MATTER OF:

Application of Chaveroo Operating Company for the amendment of Division Order No. R-8163, Lea County, New Mexico.	CASE 8876

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

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MR. CATANACH: Call next Case 8876.

MR. TAYLOR: Application of Chaveroo Operating Company for the amendment of Division Order No. R-8163, Lea County, New Mexico.

MR. CATANACH: Are there appearances in this case?

MS. AUBREY: Karen Aubrey, with the law firm of Kellahin and Kellahin, representing the Applicant.

MR. BRUCE: Jim Bruce from the Hinkle Law Firm, representing Southwestern, Incorporated.

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

MR. BRUCE: I have a little statement to make, Mr. Examiner.

MR. CATANACH: All right.

MR. BRUCE: The salt water disposal well which is the subject of Case 8876, was approved in Case 8761.

Southwestern, Incorporated, asked that Case 8761 be re-opened and consolidated for hearing with Case 8876.

If this request is granted,

Southwestern will present evidence supporting the position that the approval for the salt water disposal well should be withdrawn.

MR. CATANACH: Ms. Aubrey, do you have any objection to that?

MS. AUBREY: Yes, I do, Mr. Examiner.

The case is not docketed as a re-opening of the original salt water disposal case. That matter has been heard. The order was entered in March. It is a final order and any re-opening of it now could be nothing but a collateral attack on the matters that were heard by the examiner and the order that was entered initially.

This case is called for hearing today on behalf of Chaveroo Operating Company to seek amendment of that order for one reason only and that reason is the requirement in the order that the Cities Service BJ Well be plugged.

We are prepared today to present testimony to you to justify the exclusion of that requirement from the original salt water disposal order.

Southwestern, Inc., received notice of the original application. One of the exhibits in that matter is the certified return receipt notice from the post office that they received a copy of the application.

They received notice, also, by virtue of the publication in the newspaper and the presence of the case on the docket.

Southwest has shown no reason why they did not come forward in November when this case was presented and present whatever information they think they have on this well to the examiner.

I would ask that you allow us simply to proceed today with the matters that we are prepared to discuss, which relate solely to the condition of the Cities Service BJ Well and that you not entertain an oral motion to re-open the original case without a written application.

MR. BRUCE: If I may make further statement, Mr. Examiner.

MR. CATANACH: Go ahead, Mr. Bruce.

MR. BRUCE: In Case 8761 the primary reason Southwestern, Incorporated, seeks to re-open that case is the fact that incorrect testimony was given regarding the status of Soutwestern's VC Well No. 1, which is located approximately 100 feet from the salt water disposal well.

At page 50 in the hearing transcript, Chaveroo's witness stated that Southwestern's well

was cemented throughout the injection interval; however, Southwestern is ready to present evidence to the contrary.

I am not trying to impugn the integrity of Chaveroo's witness; rather Southwestern has re-checked the logs to determine top of the cement, and I do not believe these logs were available to Chaveroo's witness for the original hearing.

The OCD is charged with preventing the drowning by water of any formation which is capable of producing oil and gas in order to prevent waste.

If Case 8761 is not re-opened to receive new testimony regarding the status of Southwestern's well, these duties may well be violated.

Regarding notification, the original application in 8761 was ambiquous, to say the least. It gave an incorrect footage location for the proposed salt water disposal well. While the well was located in the northwest quarter of the soutwest quarter of the section, the footage location given in the original application stated it was in the -- stated that the well was 660 feet from the east line rather than 660 feet from the west line, therefore putting it in the northeast of the southeast.

This led Southwestern to believe that the well was about 3/4 of a mile from Southwestern's well. This error was never corrected on the record

and there is no evidence in the record that offset operators were re-notified of the correct location. Due to the this factor and the others just mentioned, Southwestern's request to re-open Case 8761 should be granted at this time.

Finally, allowing the cases to be heard together at this time will be in the interests of economy. If Southwestern is not allowed to present its case today, it will file an application to re-open Case 8761 and request that it be set for hearing.

In the interim Southwestern would request that Chaveroo not be permitted to inject fluids into the proposed injection interval until Southwestern's request for re-opening Case 8761 is decided.

MR. CATANACH: Mr. Bruce, do you have the notification letter sent to you by Chaveroo?

MS. AUBREY: Notification that was sent out was a copy of the application with the attached C-108.

I have a copy of that here if you'd like a copy of that.

MR. CATANACH: Did you (not clearly audible.)

MR. BRUCE: Yeah, we had the same thing that Ms. Aubrey has.

MS. AUBREY: The return re-

ceipts are already an exhibit in that case.

They'd be in the original case file.

Mr. Catanach, if I may, before you make your decision, I'd like to point out to the Examiner that the C-108 which was sent to Southwest -- Southwestern, contains two area maps, both of which show the location of the well.

In addition, we all know that Unit letter L could not be 660 feet from the east line. It would have to be 660 feet from the west line.

The C-108, which is attached to the application, makes it clear what the well location is. Southwest received it. There is a certified mail return receipt in your file in Case 8761, and Southwest has shown no reason to you why it should be allowed today without filing a written application, to move to re-open a case in which it had notice, which was adequate under the notice rules we had in November of 1985.

MR. BRUCE: At the very least, Mr. Examiner, the ambiguity in tbe notice and the Unit letter L, which I do not believe is an official designation, could just as well have been mistyped and that could have been Unit I.

MR. CATANACH: Ms. Aubrey, I'm

going to let Southwestern testify at this hearing. I think that they have sufficient reason. They may have misunderstood where the well was, going by this I have right here.

Also, their testimony may affect the order that you are here today for, so I'm going to let -- going to allow it.

You may proceed, Ms. Aubrey. Do you have any witnesses?

MR. BRUCE: Yes, one witness.

(Witnesses sworn.)

DARRELL McBRIDE,

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

DIRECT EXAMINATION

BY MS. AUBREY:

Q Would you state your name and by whom you are employed?

A I'm Darrell McBride. I'm employed by Chaveroo Operating.

Q And, Mr. McBride, in what capacity do you work for Chaveroo Operating Company?

A I'm Operations Engineer.

Q Have you testified previously before the Oil Conservation Division as an engineer and had your qualifications accepted?

A Yes.

MS. AUBREY: Mr. Examiner, I tender Mr. McBride as an expert petroleum engineer.

MR. CATANACH: Mr. McBride is considered qualified.

Q Mr. McBride, would you explain the purpose of Chaveroo's application to the Oil Conservation Division today?

A Yes, ma'am. We have a -- Mr. Examiner, we have a producing Abo well in Section 30, and we're producing approximately 300 to 325 barrels of produced water a day, and we need a means of disposing of the water.

We have tried to get it in every disposal well in that part of the country out there and we can't find any place to dispose of produced water. We're paying 84 cents a barrel at this point to have it trucked off.

We located the Apollo well as being a good prospect because they've tried to make a producing well out of it and I understand it will produce as much salt water as you want or it will take as much as you want to give it, and we've approached Apollo in regards to buying it

and at this point we're trying to find out if it's feasible if the State of New Mexico is going to let us to go into it.

Q Mr. McBride, in November of 1985 a case was presented for Chaveroo Operating Company seeking approval of the Oil Conservation Division for the disposal of produced salt water in the Apollo well, is that correct?

A Yes, ma'am.

Q And you testified for Chaveroo at that hearing, didn't you?

A Yes, ma'am, I did.

Q And an order has been entered, Order 6183, granting you the permission to dispose of produced salt water into that wellbore with the condition that you check with the Division and coordinate with them with regard to two of the wells in the area, the Phillips Petroleum Mack Jones Well and the Texas Petroleum Oil Company State AB Well No. 1?

A Yes, ma'am.

Q Have you done that? Have you come to an agreement with the district about the condition of cement in both of those wells?

A Yes, ma'am.

Q And what is the district's direction to you with regard to the two wells?

A Those two wells are no problem but the BJ

Well is a problem.

Q There's a third well in the area which is the Cities Service State BJ Well No. 1.

A Yes, ma'am.

Q The Examiner order which was entered in March required you prior to injection to either show that that well has adequate cement above, across, and below the proposed injection interval, or to re-cement that well, is that correct?

A Yes, ma'am.

Q Is the Cities Service BJ Well on your lease?

A No, ma'am.

Q Whose lease is it?

A It's Cities Service's well and they're producing it at this time.

Q So that is presently a producing well?

A Yes, ma'am.

Q In order to re-enter that wellbore and re-cement the well, what would you have to do?

A Well, we'd have to obtain permission from Cities and it would be an extensive workover. We'd have to set a bridge plug, perforate, go in and squeeze it and hopefully try to circulate, and then after we squeeze it off, we'd have to go in and drill it out; try to run a bond log

on it. We're probably looking at about a $30-to-40,000 workover. We don't know that we -- you know, we could damage the well.

Q Do you believe that there is a possibility that re-entering that wellbore could cause damage either to the wellbore or to the formation, which would make you liable to Cities Service for the unproduced hydrocarbons?

A Yes, ma'am. And there's no chance we could even get a good squeeze on it. There's no -- there's really no positive indication that we could get a good cement bond on it.

Q Let me have you look at what we've marked as Exhibit Number One, which is an area map. Can you locate for the examiner the Apollo well which is the proposed injection well, the Cities Service well, and also the Rice Engineering Well No. 1?

A Yes. Mr. Examiner, if you'll look on the map there, I've got it colored in red, Section 36, you'll see our -- the Apollo Well G-35, proposed injection well.

The BJ Well is approximately 1980 feet to the west, a little bit to the north.

Q And where is the Rice Engineering Well No. 1?

A Okay, Rice Engineering well, we're proposing injecting 300 to 350 barrels a day down this well.

To the north of it -- now, understand that BJ is a well that cement integrity -- well, the cement, according to a temperature survey has not protected all the pipe in the formations above, but to the north approximately 660 feet, Rice Engineering is injecting 6000 barrels a day down their well.

Q And they are three times closer to the Cities BJ Well than --

A Yes.

Q -- your proposed injection well.

A Yes, ma'am.

The Cities well is presently producing, is that correct?

A Yes, it is.

Q Has there been any effect on the Cities BJ No. 1 --

A No.

Q -- by the Rice Well?

A No, there hasn't been, but, you know, none that Cities noticed. I understand that they've been injecting in the Cities well, I mean in the Rice Engineering well, since 1960, 1960, I believe.

Q For a number of years they've been injecting large volumes of produced water into that wellbore and the Cities well is still producing.

Let me have you go through your exhibits here, Mr. McBride.

I believe you have photocopied some well files from the Hobbs District. We've marked those as Exhibits Four, Five, and Six. Those are the well files for the Cities well, the Rice No. 1, and also a well file for the Southwestern, Inc. well.

A I've taken these from files in the Oil and Gas Division in Hobbs. These are complete well files on Cities BJ Well.

According to calculations that I had initially done on cement, the BJ Well didn't seem to be a problem but Mr. Sexton found a -- I think it was a temperature survey of cement, you know. That's where we found out the top of cement.

I also have a well file here of the State VC Well, which is the Southwest, Inc. well at this time. The injection interval that we're injecting into is from 4804 to 5212. If you'll notice, the State VC ran six DST's and the Lower San Andres, San Andres was DST'ed. The Grayburg series, in which we will be injecting into, was never DST'ed, so that tells me there's a possibility that it may have not showed any porosity and that's why it was never DST'ed.

Q Can you tell from the well file, Mr.

McBride, when the Southwestern well was completed?

A Yes. Just one second and I'll -- according to the records here it looks like January of '61.

Q Now how far is this well from your proposed injection well?

A 120 feet.

Q And do you know from what formation the Southwestern well is producing?

A It's producing from the Abo.

Q And what footage depth?

A I don't have any perforation information available. There are none in the Hobbs office, but I would guess the perforated interval was probably, they may have perforated as high as 8800.

Q And your proposed injection interval is 4804 to 5212.

A Yes.

Q Have you prepared a wellbore schematic of the Southwestern State VC No. 1?

A Yes, I have. All my calculations were due to cement volumes. They -- the surface pipe -- they drilled a 17-1/4 inch hole at 305 feet. They ran 13-3/8ths; they circulated cement with 300 sacks.

After that they drilled an 11 inch hole to 4583; ran 8 and 5; they set it at 4583; cemented with

1400 sacks 50/50 POZ, and according to records, the cement top was at 2235.

Okay. After that they drilled a 7-7/8ths hole to TD; ran a 5-1/2 liner and they hung the liner up in the 8-58ths at 4410.

They cemented the liner with 560 sacks of cement. According to my calculations the cement should have come up to 4455, which is above 4510, which is the top of the liner, so the cement should have circulated.

At that time they moved up the hole, went in with a HOWCO squeeze tool, and they squeezed off the top of the liner with 200 sacks.

So I, you know, according to all the indications that we have at this time, I don't have any bond logs or temperature surveys, I would say the cement integrity of the liner is -- is sufficient.

Q What do you calculate from what you know about the well as the top of the cement?

A Well, provided that the liner is cemented properly, and they didn't lose returns while they were cementing the liner, the top of our cement on the 8-5/8ths is 2235.

Q And you've derived the information you have from the well file, is that correct?

A Yes, ma'am.

Q And that would be the information that the company that drilled the well submitted to the Oil Conservation --

A Yes.

Q -- Division. Has Southwest given you any logs to look at in connnection with this?

A No, they haven't.

Q Have they given you any temperature survey information?

A No, they haven't.

Q Have you talked to the folks over at Southwestern about this -- about this case?

A I talked to Mr. Nutter last week but I don't think that he had the information at the time. He was doing calculations.

Q At the time the original case was presented did Southwestern appear and give the Oil Conservation Division the benefit of their information about their well?

A No, they didn't.

Q Now with regard to the Cities Service BJ No. 1 Well, is it your opinion, Mr. McBride, that regardless of the condition of the cement in that well, that your disposal well will not affect that producing well?

A According to all -- to the information I have, the cement is sufficient. The water I'm putting down

the well at this time is treated and I would think the water I'm putting in the environment is -- is probably better than the environment that's down there at this time.

We're treating our well on a weekly basis, monitoring residuals for scale and corrosion. We also have a coupon in the line. It's a sample of metal that monitors metal corrosion over a certain period of time and the rate of corrosion has been .06 mils. I think API specs is anything in .1 is sufficient. So it's under -- as far as my -- my opinion goes, I would think that we gave Southwest, Inc., a copy of the residuals every week to let them know that we are putting good water down the hole, I don't know why they should bother with this.

Q Would you expect to see, if there were a problem with the casing of the Cities Service well, would you expect to see that problem arise as a result of Rice Engineering's years of disposal putting water into the adjoining wellbore?

A Yes, ma'am, I would think so. Since they're 660 feet away from the wellbore, I would think they would -- if there was any problem that would arise in the BJ Well, it would probably come from there.

Q In terms of Cities BJ Well, then, is your request of the Examiner to amend the terms of Order 6183 to delete the requirement that Cities BJ No. 1 be re-cemented?

A Yes.

Q Mr. McBride, with respect to this hearing I have marked as your Exhibit Two photocopies of the certified mail return receipts showing service of your application on all offset operators, including Southwestern, is that correct?

A Yes.

Q We've also marked as an exhibit in this case, Exhibit Number Three, a copy of the application which was filed in the original case and a copy of your C-108, which was filed with that application, is that correct?

A Yes.

Q In the intervening six months have you learned anything in addition to what you presented at the original hearing, which would affect the Examiner's decision as to whether or not the Apollo Energy well should be used as a disposal well?

A No, I haven't.

Q We've also marked as an exhibit the photocopy of the order which was entered in Case 8761 and that is the order which you are asking the Division to amend.

Mr. McBride, were these exhibits prepared under your direction and supervision?

A Yes.

MS. AUBREY: Mr. Examiner, I offer Exhibits One through Eight.

MR. CATANACH: Exhibits One through Eight will be admitted as evidence.

Mr. Bruce, do you have any questions?

MR. BRUCE: Several.

CROSS EXAMINATION

BY MR. BRUCE:

Q Mr. McBride, by what authority is Rice Engineering injecting into the San Andres formation in -- I forget the well number -- in the northeast of Section 35?

A I'm sorry, I can't answer that. I really don't know.

Q Referring --

A I know they were granted authority in (not clearly understood).

Q For what formation?

A Their injection interval is approximately the same as ours.

Q Referring to Exhibit Number Seven, Mr McBride, in making your calculations, did you have the caliper log from the well?

A No. Which well are you asking about?

Q The State VC No. 1 Well?

A No, no, I didn't.

Q Prior to the hearing in November on Case 8761, did you request any bonds, temperature surveys, any bonding logs from Southwestern?

A No.

Q In your calculations did you use the same yield for all the cement?

A No, I didn't.

Q What did you use?

A I used 1.43 for the yield on the long string for the liner.

Q Are you aware that on the long string there were two different kinds of cement with different yields used?

A Yes.

Q And you still used one yield.

A Yes, that's correct, I used one yield.

Q At this time do you know the condition of the pipe in the Cities Service well in Section 35?

A No, I can't say that I really do. I know that the casing was tested.

Q When?

A I'm sorry, I can't answer that. I really don't know when it was tested.

Q But there's no way of testing it on the outside.

A Yes, there's a way of testing it. I'm sorry, maybe you can be more specific on your question.

MR. BRUCE: I have no further questions.

REDIRECT EXAMINATION

BY MS. AUBREY:

Q Mr. McBride, from what you -- the information that you have, do you have any doubt that your calculation at the top of the cementis correct?

A Well, they've brought out a point that I didn't consider. There is 100 sacks latex cement as part of the 560 sacks that would have a different yield.

I'm not sure that would change the volume (unclear). The top of lining was still squeezed off with 200 sacks of cement, which is more than adequate.

Q Mr. McBride, do you have anything you want to add?

A Yes. We're planning to dispose of 350 barrels of water a day and I understand that Rice is sort of operating under a grandfather clause. We're asking for a gravity type situation instead of pressure. We just -- we want to dispose of the water. I don't see where we would

impose any pressure other than pressures that are already on the State DC.

The water is treated so if they have pipe exposed, we would -- we would probably -- it would be better than the environment it's in at this time. It's probably better for their well, their casing, and we're just trying to get rid of the 350 barrels of water a day, and Rice is in a closer proximity than we are and they're disposing 600 barrels a day.

Q With regard to the Southwestern well, the State VC, do you have an opinion as to whether or not the disposal of produced water in the Apollo Well is going to have any effect on the ability of the State VC to produce?

A I would say if they had any problems, if they have any casing problems, I don't think it would be caused by us.

We're not injecting any abnormal pressured other than what's already there, since it will be on vacuum, and since the water is treated, I -- I don't think that we could be the cause.

MS. AUBREY: That's all I have of Mr. McBride.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. McBride, you said that the Rice Engineering well was injecting in approximately the same zone that you will be injecting in?

A According to -- I have no logs to prove that, but looks like they're injecting in the San Andres, Lower.

Q Approximately the same formation?

A Yes, sir, some of our -- some of it overlaps. We overlap some of their producing -- their injection zone.

We also, we're perforated higher. I don't know, the geology in this area changes quite drastically. I'd have to -- I'd have to do some cross sections on some logs to say for sure.

Q Okay, Mr. McBride, you said that they were -- Rice Engineering was injecting approximately 6000 --

A Yes. That's what Mr. Goodheart informed. That was at the last hearing.

Q I didn't see a schematic of the Cities Service well. Do you have one?

A I think there's a schematic but understand it was calculated tops and a bond log, or it was either a bond log or temperature survey that Cities has on

file. Well, it pretty well throws these calculations all out. I don't think we have one submitted as an exhibit.

I do have one, though.

MS. AUBREY: Mr. Examiner, we don't seem to be able to locate our schematic on the Cities BJ Well right now. We will be happy to prepare one and submit it to you after the hearing.

MR. CATANACH: Thank you, Ms. Aubrey.

Q Mr. McBride, did you -- you said you contacted the District personnel and talked to them about the Cities Service well. What did they tell you?

A Well Jerry had -- Jerry submitted a letter to my office in Houston saying that if we would -- that the cement, according to a temperature, a bond log, I'm not sure, did not effectively cover the injection zone, and that if we wanted to inject in the well we would have to, of course, either P&A the well or go in and squeeze it off. I don't think he specified how we should do it, but he just specified we needed to cover it with cement.

MS. AUBREY: Mr. Examiner, I've located the wellbore schematic. I have only one copy of it. We'd be happy to offer it as our Exhibit Nine.

MR. CATANACH: Thank you, Ms. Aubrey.

Q Mr. McBride, do you know, do you have any idea of what the producing rate is from the Cities Service well?

A No, I don't. I know it's a marginal well.

Q It is marginal?

A Yes. It has -- most of the wells in this area have cumed anywhere from 250 to 400,000 barrels and I think they're probably -- they're probably producing 6-to-8 barrels a day. I'm -- I don't know for sure.

Q Was Cities Service aware of your requirement? Did you contact Cities Service at all?

A Yes. We submitted the -- when we had our first hearing we submitted the (not clearly understood) C-108.

Q Was Cities Service aware that were -- had to comply with the requirement to cement their well?

A No, not at that time. They, later they had Jerry, I guess Jerry, or somebody in the District Office had called to find out if they had a log or anything in their well files, and, of course, a temperature survey to produce, or a bond log, whatever it was, and it showed a calculated top.

Q So you haven't talked to them.

A I talked to them after that. I was call-

ing to verify, make sure, and I talked to an engineer. He pulled it. I never looked at it personally but he said that -- he gave me the top off the cement, which I don't have that number with me at this time.

Q Mr. McBride, did they have any objection to you doing work to their well, that you know of?

A I never approached them but I would say at this point that the feasibility of us doing that would be -- wouldn't be cost effective.

MR. CATANACH: I have no further questions of the witness.

Any other questions?

If not, he may be excused.

DANIEL S. NUTTER,

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

DIRECT EXAMINATION

BY MR. BRUCE:

Q Mr. Nutter, would you please state your full name and address?

A Dan Nutter, Santa Fe, New Mexico.

Q And what is your occupation and your relationship to Southwestern, Incorporated?

A I'm a consulting petroleum engineer and I've been retained by Southwestern, Inc., in this particular case.

Q Have you previously testified before the New Mexico OCD as an engineer?

A I have.

Q And have you reviewed the OCD file on the State VC Well and also well logs owned by Southwestern regarding the same well in preparation for this case?

A I have.

MR. BRUCE: Mr. Examiner, I tender Mr. Nutter as an expert witness.

MR. CATANACH: Mr. Nutter is considered qualified.

Q Mr. Nutter, would you please refer to Southwestern Exhibit Number One and briefly describe it?

A Southwestern Exhibit Number One is a hand drawn plat. It's a two page exhibit, first of all.

The first page is a hand drawn plat showing Section 36 of Township 17 South, Range 35 East, and the wells located in that section.

The previous exhibit by the -- by Mr. McBride was a smaller scale and it looked almost as though the two wells were on dot on that, but at least on this scale I'm able to make two dots, although they do overlap

for these two particular wells.

Mr. McBride also stated that the wells are 120 feet apart but I think if you'll -- if the Examiner will calculate the distance between the two wells based on the surface locations, he'll find that they're less than 100 feet apart.

The second page of the exhibit is a copy of a photograph that was recently taken showing the two wells.

Q Would you now please move on to Exhibit Two and describe its contents?

A Exhibit Two is a well data sheet showing the surface, intermediate, and production casing in the well.

I'll go through this because some of it's going to be very pertinent in the later stages of this testimony.

Surface casing was set as follows: A 17-1/4 inch hole was drilled to 305 feet. 13-3/8ths inch 30-pound casing was set at 296 feet and cemented with 300 sacks of regular cement. The cement circulated to the surface.

After cementing the surface pipe they drilled a 11-inch hole to 4583 feet and 8-5/8ths inch OD casing weighing 24 pounds and 32 pounds per foot was set at 4583; cemented with 1400 sacks of 50/50 POZ mix with 2 per-

cent gel and 100 sacks of regular cement.

The top of the cement by temperature survey was 2348 feet.

After this a 7-7/8ths inch hole was drilled to 9075 feet. A 5-1/2 inch 15.5 pound and 17 pound liner was set at 9072 and cemented with 8-5/8ths by 5-1/2 inch brown Type C liner hanger set at 4510 feet.

The liner was cemented at the bottom with 460 sacks of 50/50 POZ mix with 4 percent gel and 100 sacks of latex cement. It was squeeze cemented at the top of the liner with 200 sacks of regular cement. 50 feet of cement was left inside the 8-5/8ths inch casing. No casing top was reported. No cement top was reported.

For completion of the well it was perforated in the Abo formation between 8890 and 8910. I also found later that there were some additional perforations from 8917 to 8930 feet, all in the Abo formation.

Q Mr. Nutter, you mentioned that the top of the cement in the intermediate casing by temperature survey was 2348 feet. Is there any significance to that fact?

A Yes, there is. If we go to the next exhibit we'll find an Amerada bottom hole pressure temperature report on that 8-5/8ths inch casing when it was run.

They cemented the casing with 1400 sacks of 50/50 POZ mix with 22 percent gel and 100 sacks of regu-

lar cement. Now, they didn't know -- they had a suspicion it did not go to the top, I presume, because they cemented it with enough cement which should have circulated and it didn't circulate, so they ran a temperature survey.

Now you'll notice down here at the lower lefthand portion of this calculation by Amerada that the top of the cement was found by temperature survey to be at 2348. The actual fill was 2235 feet. The calculated fill had been 6948 feet. They only got a 32.2 percent fill on their calculation.

Now I thought, well, maybe when they made the original calculation that they hadn't taken into consideration washout of the hole; that they had just assumed an 11 inch hole all the way down to run this 8-5/8ths inch casing.

So I went back and made a calculation using this volume of cement and it's obvious that they must have run a caliper log on it before because with this volume of cement 8-5/9ths inch casing in a straight 11-inch hole, they would have gotten 6,849 feet of linear feet of cement and it would have been sticking up in the air 2,266 feet, which I don't think Amerada intended.

So they must have obviously thought there had been a washout or expansion of the hole, but shrinkage and filtrate loss caused this cement to only get a 32 per-

cent fill fo what they had originally calculated on, and shrinkage and filtrate loss is a very important factor in cementing these wells.

Q Thank you. Would you now discuss the cementing data and move on to Exhibit Number Four?

A Okay. Exhibit Number Four is the cementing data on the production liner. They mixed 460 sacks the following cement blend: Class H 50/50 POZ mix A containing 4 percent gel. Slurry weight was 13.6 pounds per gallon. Slurry volume was 1.43 cubic feet per sack. The water ratio was about 6.95 gallons per sack.

They tailed that in with 100 sacks of latex cement. Halliburton recommends this latex cement mixed with 6 gallons of water per sack and you'd have a slurry volume of 1.4 cubic feet per sack and slurry weight of 14-1/2 pounds per gallon.

The top liner squeeze was not specified, but as I said, regular cement, it undoubtedly was 100 sacks of Class H cement. The recommended Halliburton mix for that would be 5.2 gallons per sack, would give you a weight of 15.6 pounds per gallon and a 1.18 cubic foot per sack volume.

Q Would you please now discuss the microlog submitted to the OCD as Exhibit Number Five?

A Okay, I only have one copy of that log

and the Examiner has the log.

It's a Schlumberger microlog. It was run on January 13th, 1961. Shown on this log is a micro-caliper hole size, a gamma ray and resistivity. The casing point on the log is shown to be at 4584 feet, although the previous testimony and the well files reflect the casing was set at 4583; however, the first good reading you get on that after -- when they logged it after casing had been run, is 4585 feet, so we're going to use 4585 feet as being the casing point from here on in this discussion.

Note that I've marked the bit size along the lefthand side of the log with a red lined the entire length of the log. The bit size was 7-7/8ths inches. That's merely a red line which is on top of the line that Schlumberger drew on the -- on the log as they made the log. There's places where I skipped my red line so you can see there's a little fine line that Schlumberger drew there showing the bit size, 7-7/8ths inches.

The hole size increases to the right with each vertical line representing one inch. It starts on the lefthand column at six inches and each one of those vertical lines is one more inch of diameter to the hole.

For example, from 4600 to 4650 the hole averages just about 11 inches in diameter. The heavy line coming down through there is the 11-inch hole -- is the 11-

inch marker.

And about the first or second inch marker to the right of the 11-inch line I've made a number of little, tiny x's. As you go down through that log, Mr. Examiner, you'll find some little, tiny x's made in pencil in about the first or second increment to the right of the 11-inch log -- of the 11-inch diameter marker.

Those little x-s mark the increments in which I measured the hole volume. By the way, the top of the various formations are marked in red. The top of the San Andres occurs there at 4798 feet, you'll notice.

Q Would you now please move on to Exhibit Number Six and discuss that for the Examiner?

A Exhibit Number Six is taken from the information that derived from the caliper log. Now, where I have those x's, are the increments that I measured the diameter of the hole.

Those -- the marks of the x's are indicated in the first two columns on Exhibit Number Six. For instance, the first one is from 4585 feet to 4600 feet. The length of the interval there is 15 feet and the average hole size I estimated to be 10-1/2 inches.

Then the next column is the cubic fill, the cement fill factor of cubic feet per foot. That would be the number of cubic feet of cement it takes to fill one

foot of linear length of that annulus between the 8-5/8ths inch casing and a hole that is 10-1/2 inched in diameter for that first increment.

The volume that would be required to fill that 15 feet interval would be 6.54 cubic feet. Now, this exhibit calculates fill coming from the bottom of the hole up, because this cement -- this casing was cemented in two stages. It was first cemented from the bottom and Exhibit Number Six shows the amount of fill when you cemented it from the bottom.

Later it was squeeze cemented from the top and Exhibit Number Seven is the same calculations but here we're calculating the -- the cumulative fill as coming down the hole from the liner hanger, squeeze cementing down from 4510 into the annulus between the 8-5/8ths -- between the 5-1/2 inch pipe and the 7-7/8ths or whatever diameter the hole might be.

Q Will you please now move on to Exhibit Number Eight?

A Okay. Having made the caliper survey analysis and made the volume analysis, then I proceeded on Exhibit Number Eight ot make top of cement and height of cement determinations.

Now the primary cement job on the bottom of the liner, we have -- remember, we had 460 sacks of 50/50

POZ mix with 4. -- 4 percent gel. That had a slurry volume of 1.43 cubic feet per sack. The factor times the 460 sacks of cement gives us 658 cubic feet of cement.

The 100 sacks of latex cement with a 1.4 cubic feet per sack, gives us 140 cubic feet of cement. So the total slurry volume was 798 cubic feet.

Now, if you'll refer back to Exhibit Number Six, Mr. Examiner, which is the calculation of the cement fill calculations from the bottom of the hole up, now we had 798 feet that we had -- that we have available to us to cement from the bottom of the pipe. We start out from the bottom. As we come up we get to the depth of from 6020 -- from 6100 to 6380 consumed 798 -- 782.93 cubic feet of cement.

Okay, we had 798 available to us, so of the 798 that we had, we've used 782.93 to get up to 6100, so we've got 14.87 cubic feet left. Using the factor or 6020 to 6100 feet, which is cubic feet per linear foot, the factor is .2768, we find we get from that remaining cement 53.72 linear feet.

The 53.72 plus the 6100 that we already had, shows the cement came up to a depth -- we subtract the 53 because we're coming up, we find that the cement came ot a depth of 6,046.28 feet, 6-0-4-6 rounded off.

That's on the bottom of cement job.

Mr. McBride testified the cement was circulated. There's no way this cement could have been circulated with this hole diameter as it is.

Okay. Now we go the bottom of Exhibit Number Eight and we find the liner squeeze from the top of the liner.

Here we have 200 sacks of regular Class H cement and a slurry volume taken from the previous exhibit of 1.18 cubic feet per sack. So we ahve 200 sacks times the 1.18, or 326 cubic feet of slurry.

Now, you'll note -- you'll remember I mentioned that 50 feet of cement was left in the 8-5/8ths inch casing. That calculates out with -- considering the volume of 8-5/8ths inch casing of that weight, that calculates out to be 17.1 cubic feet of cement was left inside the casing.

So we take the 17 feet off our 236 and we have available to squeeze cement the well 218.9 cubic feet, all it 219.

Now if we go to Exhibit Number Seven, which is the squeeze calculations coming from the top, we find that of our 219 feet we get down to a depth of 5050 and we've used 203.47 sacks of cement to get to 5050. 203 sacks off of the 219 that we had leaves us 15.53 sacks left. Using the factor for cubic feet per foot in the range from

5050 to 5150, that factor is 3535 and we find that the 15.53 sacks of cement will give us a total of 43.93 linear feet.

So we add that to the 5050 we've already come down with our 203 sacks of cement and we find that the cement came down from the squeeze job at the top to a depth of 5094.

So then we have those two conclusions, that under condition one, cementing from the bottom of the hole, we came up to 6046.

Coming down from the hanger we came down to 5094. That's under what I call condition one. Condition one is assuming that you have no shrinkage of the cement and you have no filtrate loss.

Now we know that cement shrinks as it sets. That's a law of cement.

We also know that in oil wells there's a filtration loss, especially on the squeeze job and normally 20 percent is an excessive amount to use for shrinkage and filtrate loss and 20 percent loss, or the way the cementing companies call it, a 20 percent excess, is set out here in condition number two to the right.

With condition number two, the bottom of the -- the top of the cement on the bottom cement job would be down at 6651 feet.

The bottom of the cement on the top ce

ment job, the squeeze job, would to come 4992 feet. So we would have the interval on condition two from 4992 to 6651 which had no cement on the -- on the 5-1/2 inch casing.

Q Thank you. Now please move on to the well schematic marked Exhibit Number Nine and discuss its contents.

A This is an illustration of what I just was talking about. The proposed disposal zone is form 4804 feet to 5212 feet. If we go to condition two our cement comes to 4992 feet on the upper cement job and it comes to 6046 feet on the lower cement job, so we don't have any cement from 4992 to 604 feet -- 6046. Therefore, their disposal, starting at 4804, would be behind our casing -- under condition number two, their disposal would be behind our cement from 4804 to 4992, but their disposal zone from 4992 down to 5212 would be against our pipe without any cement on it. This would leave 220 feet of our pipe exposed to the water.

Q Thank you.

A Under condition two.

Under condition one there would be -- assuming that we had no shrinkage of our cement whatsoever, under condition one there would be 118 feet of our pipe exposed to water; however, I don't believe that that is the -- I don't believe that is the case.

Q Mr. Nutter, Mr. McBride previously stated that the water Chaveroo was injecting or was going to inject was of higher quality than the formation water. Do you have an opinion on that?

A Yes. At his hearing in November he gave an analysis of the water in the San Andres that reported but I think it was around 54,000, if I recall, but he also had a water analysis on his disposal water and that was 130-some thousand, or something like that, so the quality of the water that he's putting into the formation is much higher in dissolved solids, particularly chlorides, than the water that's in the formation.

Q Thank you. What date, referring over to the Rice injection well, what date has the Rice well been injecting since?

A Well, Mr. McBride said they started injecting in 1960; however, the order wasn't entered for disposal in this well until June of 1967, and at that time disposal was authorized into the Paddock formation from 6955 feet to 6995 feet.

Now I have searched for any authorization in the Commission records to find any approval for disposal into any interval other than 6955 to 6995, and I've been unable to find any. I can't believe that Rice would have gone in as they indicated on a Form C-103 filed January the 21st

of 1970, and showed that they perforated the San Andres, I can't believe they would have done that without some authority, but I can find no authority for it. All I can find is that authorized disposal into the Paddock.

Now he also mentioned that they would be disposing, Apollo would be disposing to the same zone in the San Andres or an overlapping zone, I think he mentioned, that Rice Engineering is disposing into; however, if you'll look at the Form C-103 that was filed by Rice in 1970, you'll see that their uppermost perforation in the San Andres is at 5230 feet, which is below his lowermost perforation of 5212.

So there is no overlap at all. They're disposing -- I also reviewed records of other salt water disposals that have been approved in the area.

For instance, the other Rice disposal well, which is in Unit letter G, I believe it is, of -- it's in Unit letter G, that's an old Phillips well and that was authorized for disposal into the Lower San Andres 250 feet below the oil/water contact; didn't give any specific depth. But all of those disposals have always been into the Lower San Andres.

Here we've got an applicant that is asking for approval to dispose into the Upper San Andres and if you'll look a the porosity intervals on that log I gave you,

Mr. Examiner, you'll see that there are porosities in the Lower San Andres that are available.

But he's seeking to dispose in that uppermost porosity zone.

I can't find any record where that's ever been approved for disposal in any well.

Q Mr. Nutter, in your opinion should the authority of Chaveroo to inject salt water in its well be revoked?

A I believe it should because there was incorrect information given at the original hearing when it was stated that the cement was circulated on the State VC No. 1 Well, and in accordance with the Commission's practices for the last five years, approval has not been given for disposal into zones where there is open casing on wells.

Q Okay.

A So I think under the existing conditions that the Commission -- or the existing policies of the Commission at this time, that it would be contrary to those policies to allow disposal into this well.

Q Were Exhibits One through Nine prepared by you or compiled from Southwestern's company records?

A Yes, they were.

Q In your opinion will denial of Chaveroo's salt water disposal or granting of Soutwestern, Inc.'s re-

quest to rescind Chaveroo's salt water disposal authority prevent waste and protect correlative rights?

A I think it very likely might prevent waste because the State VC Well is a producing well. In the past two years from December of '83 to December of '85 it paid the State $15,945.87 in royalties and $8,733.44 in production taxes and if something should happen to this well it would just be that much income lost to the State of New Mexico, and that would be -- that would definitely be waste, and, I don't know, they've got a problem with disposal. I can't see why Rice's two wells immediately west here, putting in 6000 barrels a day, I believe, he mentioned, can't dispose of the water -- why they can't dispose of the water into the Rice well.

I know my -- my client is trucking the water out.

Q Thank you.

A That's -- that's expensive to truck out but it's part of the cost of operating and I don't know if they've approached Rice themselves, yet, to put their water in there.

Q Thank you, Mr. Nutter.

MR. BRUCE: At this time I move the admission of Exhibits One through Nine.

MR. CATANACH: Exhibits One

through Nine will be admitted.

MR. BRUCE: I have no further questions at this time.

A I meant my clients. I didn't know if my clients had approached Rice.

MS. AUBREY: Mr. Examiner, would this be a good time to take a break? I'd like to talk to my witness about some things?

MR. CATANACH: Sure, let's take about a fifteen minute break.

(Thereupon a recess was taken.)

MR. CATANACH: Ms. Aubrey, you may proceed.

MS. AUBREY: Thank you, Mr. Examiner.

CROSS EXAMINATION

BY MS. AUBREY:

Q Mr. Nutter, we only have one copy of this log, as I understand it.

A That's correct.

Q That's Southwest Exhibit Number Five.

A That is Southwest Exhibit Number Five and

I believe, if necessary, we could provide another copy of the log to you all, but not today.

Q Now as I understand it, you have used this log in preparing your Exhibits Number Six and Seven.

A That is correct.

Q And you have used the caliper line, which is the lighter line, to show which -- which is supposed to show the size of the hole.

A The caliper is the heavy dark line.

Q And the light line here?

A The light line is the gamma ray.

Q And you have placed some x's in pencil on the log at intervals which --

A Those mark the intervals on Exhibits Six and Seven, bottom of the intervals.

Q How have you chosen those intervals?

A In doing this you take what looks like a rather uniform section that you can take a straight edge and say there's a certain amount of deviation on the left side and a certain deviation on the right side, and if you get into a place where there's -- where you can't balance by going left and right, you change your interval.

I believe the first interval on Exhibit Number Six or Seven, the first interval was from 4585 to 4600. That's because this is kind of a sloping thing. So I

took -- what I do, I take an imaginary line and draw it about halfway there so that I've got the same amount on the left side as I do on the right side, and that would be the approximate hole diameter then.

Q You're just doing that by eye, is that correct?

A That's done by eye, correct. It's standard procedure to do it by eye.

And then when you -- if you get into a place where the lines are relatively straight you can take a longer interval. I think I have some intervals here, one interval goes as high as 350 feet between 7350 and 7700. That must be a very uniform section of caliper size.

Q Now, Mr. Nutter, the blocks here are -- this moves out, as I understand it, from 6 feet to 16 feet --

A Inches.

Q -- I mean 6 inches to 16 inches?

A This -- the first line on the left is 6 inches. The heavy line is 11 inches. The red line is the bit size, which is 7-7/8ths inches, so that's just under the 8-inch line.

Q So anything underneath the heavier line would be less than 11 inches, is that right?

A That is correct and anything to the -- on

this, on my side of the 11-inch line is -- for instance, right here, that would be almost 13 inches at that point. That's at, for the record, that's at 4800.

Q You have the top of the San Andres formation shown on the log. Did you write that on the log?

A I wrote that in.

Q Okay, did you write in the Lower San Andres?

A The top of the Glorieta's on there. That would be the San Andres. It's down at 66-something, as I recall. I didn't put the Abo because I didn't think it was necessary on this hearing, but the base of the San Andres or the top of the Glorieta is on there.

Q Depending on the actual size of the hole, that's going to make a difference in how much cement there is, isn't it?

A Oh, it would make a tremendous difference.

Q Let me refer you to your Exhibit Number Nine. Do you have that in front of you?

A I'll get it. Okay.

Q You have drawn this wellbore schematic to show no cement through the proposed salt water disposal zone, is that correct?

A I've shown no cement through a portion

of it. Now in the bracket on the left I show the proposed disposal zone at 4804 to 5212 and I concede that there is some cement opposite the upper portion of your disposal zone because under condition two the top -- the bottom of the cement would be at 4992, so you would have cement from 4804 to 4992.

Q And that's based on your calculations of the hole size and the water ratio --

A And the cubic feet per sack and all that.

Q -- the slurry volume, and all that.

A Uh-huh. That's correct.

Q And you show the cement coming down from the top and stopping.

A Right.

Q Can you explain for me what's stopping the cement?

A Yeah, when they cement the well the -- the wellbore is full of mud and they squeeze it. This is put in under tremendous pressure. That's why you have more -- more loss to filtration on a squeeze job than you have on a normal cementing procedure, because that's put in under tremendous pressure.

Q Would it --

A Through the liner hanger.

Q Would it be possible to take the cement

interval, the upper cement interval which you show, which comes down into the proposed disposal zone, and move that down?

A Do what, now?

Q Simply move it down; make the bottom of the cement and the top of the cement lower?

A Make the bottom and the top lower? No, because when they cemented that, when they cemented, they were squeezing from the liner hanger and they left 50 feet of cement in the pipe so there was cement in the pipe. There was cement all the way to the top of the liner hanger. In other words, when they squeezed in here, they have a tool that comes across and they squeezed this cement through here and it come down in here, and they left 50 feet of cement in this area.

Q Uh-huh.

A So they couldn't -- you couldn't push the cement down because there wouldn't be anything to push the cement down with. They left cement in the pipe. That's where they lost about 17 feet of cement that -- they lost 17 feet of cement in the pipe that did not get squeezed into the formation.

Q Mr. Nutter, I gave you my copy of Exhibit Six. Could I have that back for a minute?

A Yeah. I though it looked strange. It

had the number marked with ink and I didn't think I had marked a number in ink, but I've already lost it, Karen. It's in this stack of stuff over here, I bet. There it is.

Q Thank you. Do you have a temperature survey which shows you the bottom of the cement that you have drawn on your -- on your Exhibit Number Nine.

A The bottom of which cement?

Q Of your upper --

A Of the squeeze job?

Q Yes, do you have a temperature --

A No temperature --

Q -- survey?

A -- no temperature -- you can find on record that any bonding log or temperature survey was ever run.

Q So this is --

A On 5-1/2 inch pipe.

Q -- based solely on your calculations of --

A This is based solely on calculations.

Q -- volumes and sacks of cement.

A Correct.

Q And the size of the hole.

A That is correct. It's unfortunate that a survey was not run.

Q I notice that you used, on your Exhibit Number Four used a slurry volume of 1.43.

A Uh-huh.

Q And 1.4.

A Uh-huh.

Q How different is that from the 1.43 that Mr. McBride used in calculating the top of the cement?

A The -- well, I don't know. If he -- if he used 143 for the entire thing, he would have expanded the lower 100 sacks by 3 cubic feet, I guess it would be. 1.43 times 100 would be 143 rather than 140. He would have got-ten 3 more sacks of cement than -- or 3 cubic feet than I got.

Q In your opinion is that a significant difference?

A Three feet might make a difference in some circumstances, you bet.

Q In this case?

A I don't know.

Q Now you testified that you had searched the Oil Commission records and Rice Engineering was author-ized to dispose of produced water in the Paddock formation in their Rice No. 1, is that correct?

A That's correct. That was Order No. R-3239. It was actually authorization to Jones Exploration

Company, and the Commission records still reflect that R-3239 is the authorizing order for disposal into the well and I haven't been able to find another order.

Q Rice Engineering's a recognized oil and gas operator, is that correct.

A Oh, yes. Well, no, they're a recognized salt water disposal company.

Q You don't believe they would be doing something without a --

A I can't --

Q -- Commission order?

A I can't understand how they would be doing this without authorization. That's why I -- that's why Mr. Bruce asked Mr. McBride if he knew the order number that authorized the disposal because we haven't been able to find it.

Q Let me show you what I've marked as Chaveroo Exhibit Number Ten, which is a letter from Rice Engineering which indicates that they are disposing of produced water into that wellbore in the Lower San Andres from 5230 to 5755.

A Right. Do they give the order number that authorized it?

Q Do you have the exhibit, Mr. Nutter?

A Yes, I have.

Q Now was your testimony that the Rice -- Rice Engineering could not be disposing of produced water in that wellbore in the same formation asd Mr. McBride's proposed disposal in the Apollo wellbore?

A I said there was -- he said there was an overlapping of the proposed disposal zone and the zone that Rice was using. He said, he used the word. He said there's an overlap; however, Chaveroo is proposing to dispose from 4804 to 5212. The uppermost perforation that Rice is using is at 5230.

Q Well, Mr. Nutter, do you have an opinion as to whether or not those are the same formations, whether or not they are the same subsea depth?

A The wells are close enough and there's not enough relief in many of these formations to -- to make that much difference. I don't know what the surface elevation is but I would doubt if there's three feet difference in the surface elevation, and I don't know, I haven't made a cross section to show the structural difference.

Q You haven't studied that subject, have you, Mr. Nutter?

A I have not, and I have not seen the log of the Rice well.

Q So it's speculation on your part that there would not be more than three feet difference between

the subsea depths of the --

A The surface --

Q Let me finish my question -- of the Lower San Andres between the Rice well --

A No, I didn't say that at all.

Q -- and the Apollo well.

A I didn't say that at all.

Q What did you say?

A I said that I doubt if there's three feet difference in the surface elevations because that's very flat country out there.

Q Now we're talking about subsea depths, correct?

A I -- that is correct, but you can't tell what it is until you've seen the logs of the two wells side by side.

Q Let me show you what I've marked as Chaveroo Exhibit Number Eleven, which is a photocopy of the well file on the Apollo Energy well from the records of the Oil Conservation Division, and you're welcome to look through all of this. I will ask you to look now, though, at the page I've turned to, which shows that the producing interval in the Apollo well is from 4881 to 5212 and shows it as the bottom or Lower San Andres.

A Where does it say -- oh, this is abso-

lutely incorrect to say bottom of the San Andres. I'd take -- I'd take exception to the remark on that form any time because it's not the bottom of the San Andres by any means.

Q You will agree with me that that's what it says on the form, is that right?

A I'd agree that it says that on the form but I'd take exception to the veracity of the statement.

Q And you're disagreeing that that footage depth would be --

A That is not --

Q Let me finish my question, Mr. Nutter, -- would be in the formation known as the Lower San Andres?

A No, that is not the lower formation of the San Andres. That's the Upper San Andres, and when they say the bottom San Andres they're in error, because the bottom of the San Andres is another 2000 feet below that, or 1000 feet below that.

Q Now, you have some dispute about the quality of the water being put into -- proposed to be put into the Apollo well, is that right?

A That's correct.

Q Have you performed any tests or are you aware of any tests --

A No, I --

Q Mr. Nutter, it would be helpful to all of

us, I think, if you would let me finish the question so you know where I'm going.

A I thought you'd made a complete question, have you performed any tests or have you made any tests.

Q Have you --

A That sounds like a complete statement to me.

Q Have you performed any tests or made any tests on the produced water proposed to be injected into the Apollo well?

A No, I haven't but I do have some exhibits that were presented by Mr. McBride at the last hearing.

Q Mr. Nutter, have you done any tests or seen any tests which have been performed on the produced water from the Southwest well?

A No, I haven't seen any water tests or analyses on the Southwest well, no.

Q I'm talking about the water that's coming out of the Southwest wellbore which you testified was being trucked.

A That's coming from the Abo. No, I don't have an analysis on the Abo water in that well, no.

Q So you do not know whether the proposed injection fluids are better in terms of chlorides, et cetera, than the water that's coming out of the Southwest

well.

A No. The Southwest well is not the subject here.

Q Well, I just want to know whether or not you -- you've made some statements about the quality of the water, Mr. Nutter, and I want to know what you've looked at.

Let me have you look at your Exhibit Number One, now.

A Okay.

Q Did you go out on the ground and measure the distance between the two wells?

A No, I went by the Commission records in making this exhibit. These are the actual footages that are described in the Commission records, and the distance between the wells is a simple calculation using Pythagoras' theorem.

Q Have we --

A Which is rather well recognized.

A Have we established through your testimony with regard to the well file on the Apollo well that perhaps those records aren't always accurate?

A Well, the surveyor's plat is in the well records and I was assuming that the surveyor's plat was correct.

Q Now did you take this photograph which

you've attached to --

A No, I didn't.

Q Do you know who took it?

A I do not. That is from a letter that was sent -- that was attached to a letter that was sent to Mr. Stamets by Southwestern and I presume it was taken by Southwestern or an employee of Southwestern.

Q And do you know whether or not the pumping units on what I suppose are the two wells in question are the same size pumping units?

A I don't see. I haven't seen the wells in the field. But I do know that the wells are approximately -- it's obvious from the calculation that when Amerada staked their well the old G-1 was a dry hole drilled by Continental Oil Company in 1939, and Amerada wanted to drill a well on the same 40 and they obviously told the engineer that staked the location to get 100 feet away from it and he went out there and calculated what he would have to do to get 100 feet away from it, and he did it as well as he could with 3/10ths a foot measurement and came out 99.98. I think his objective was to get 100 feet to the northwest.

Q And is someone went out on the ground and measured it at exactly 120 feet, you wouldn't have any problem with 20 feet farther, would you?

A Well, if it was 120 feet it wasn't --

there was either an error in the survey or something.

Q But would you have any problem with that? Would it change any of the opinions you've given us today, to be 120 feet away?

A It wouldn't change my opinion that it would be just as disastrous to the Southwest Well to inject at 120 feet as it would be at 100 feet.

Q And what do you think would be a safe distance?

A A mile, 3/4 of a mile, maybe. The Commission wants records on wells within a half a mile, so I'd say at the minimum a half a mile.

Q Even assuming that the Southwest well is cemented in the fashion that you have described to the Examiner today?

A You mean would I --

Q Assume there's no cement over the proposed disposal interval, how far away would you have to be?

A I've seen Commission cases that wouldn't allow injection until wells a mile or more away were recemented.

I think it depends on a lot of factors.

Q Do you have an opinion as to whether or not the Rice Engineering No. 1 Well is having any effect on the Southwest well?

A I have no idea.

Q Is Southwest concerned about the fact that there are 6000 barrels a day being injected into that wellbore?

A We're concerned about the authority that was given for that because it could be that -- I don't know. I could have an adverse effect on our well, yes.

Q Does Southwest have any position on whether or not it would permit Chaveroo to re-enter the Southwest well and re-cement it?

A You'd have to talk to Southwest management on that.

Q You're not representing them here on that issue?

A Not on that issue at all. I think what we would seek would be to have the Southwest well added -- either prohibit the disposal into the well or have the Southwest well added to that list that's in the existing order.

Q On your Exhibits Six and Seven you have a cement fill factor in cubic feet per foot?

A Uh-huh.

Q Where did you get that?

A From the Halliburton tables.

MS. AUBREY: I have no more

questions, Mr. Examiner.

MR. CATANACH: I have no questions of the witness.

MR. BRUCE: I have one question, Mr. Examiner.

REDIRECT EXAMINATION

BY MR. BRUCE:

Q Mr. Nutter, regardless of the injection interval of the Rice Engineering well, according to your calculations will water injected into the Chaveroo be injected into an interval in which Southwestern's well is uncemented?

A Yes, it will.

MR. BRUCE: No further questions.

MR. CATANACH: The witness may be excused.

MS. AUBREY: I have no more questions.

Mr. Catanach, I offered two exhibits during the testimony of Mr. -- I talked about two exhibits during Mr. Nutter's testimony. I'd like to offer them as Exhibits Ten and Eleven.

I have only one copy of each of

those. I will be happy to provide copies.

MR. CATANACH: Okay, thank you, Ms. Aubrey.

Exhibits Ten and Eleven will be admitted as evidence.

Ms. Aubrey, Mr. Bruce, do you have any closing statements?

MR. BRUCE: I have a very brief one.

I'm sure Ms. Aubrey doesn't mind if I go first.

MS. AUBREY: Not at all.

MR. BRUCE: Very briefly, Mr. Examiner, for some time now the OCD has been quite reluctant to approve a salt water disposal well if there is any chance of adversely affecting a well which is uncemented in the injection interval, especially if that well was productive of oil or gas.

Southwestern has presented evidence that its well is uncemented in most of the proposed injection interval; therefore, this OCD policy should be adhered to and the authority of Chaveroo to inject salt water into its well should be revoked.

Furthermore, until Southwestern's request in Case 8761 and Case 8876 are decided, Chav-

eroo should be forbidden from injecting any salt water into its well.

MR. CATANACH: Thank you, Mr. Bruce.

Ms. Aubrey?

MS. AUBREY: Thank you. I'd first like to repeat something that we talked about in the opening and that's that I don't believe that this Division has the authority to entertain this case as a re-opening of an order when the case is not advertised that way.

This case was advertised by Chaveroo for one purpose and one purpose only and that was to talk about the Cities Service BJ No. 1 Well and without notice to offset operators or to Chaveroo we have obtained an amendment of an existing Oil Commission order.

Southwestern, Inc., has presented testimony that based upon opinion and conjecture their well is uncemented through a portion of the proposed disposal interval; however, they have not presented any testimony that the quality of water which is going to be injected into the proposed Chaveroo well will in any way be more corrosive or more damaging than the water which is presently existing in that wellbore, or the water which is existing in the environment.

Mr. McBride testified that he

treats the well, he treats the water. In many cases the water that he -- that comes out of his well is better environmentally than the water that you find in this area and the Examiner knows what he quality of those waters are in the southeast part of the state.

We would ask that you approve Chaveroo's request to amend the existing order and find that the Cities Service BJ Well is not a problem well and does not need to be re-cemented, and that be the only change which is made in that order since that is the only change which has been docketed for hearing today.

MR. CATANACH: Thank you, Ms. Aubrey.

I would ask one more thing of Mr. McBride, if he would submit a cross section to us showing the Cities Service well and the proposed injection well.

MR. McBRIDE: Okay, bring it back across the VC.

MR. BRUCE: Would you please submit a copy to us, too, Mr. McBride?

MR. CATANACH: Is there anything further in Case 8876?

If not, it will be taken under advisement.

(Hearing concluded.)

C E R T I F I C A T E

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

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 8871 heard by me on April 16, 1986.

David Catanach, Examiner
Oil Conservation Division