BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
January 27, 1972

SPECIAL HEARING

IN THE MATTER OF:

Application of Continental Oil Company for an order to ensure ratable taking of gas and an exception to Order No. R-1670, Rio Arriba County, New Mexico

Case No. 4628

BEFORE:

State Geologist A. L. Porter, Jr.,
Secretary-Director.

TRANSCRIPT OF HEARING
Volume II

January 27 9:00 A.M.

MR. PORTER: The hearing will come to order, please. Mr. Haseltine, I believe you were on the stand, even though your attorney would agree to waive cross-examination, somebody would like to ask you a few questions.

CROSS-EXAMINATION

BY MR. KELLAHIN

Q Mr. Haseltine, in connection with your Exhibit No. 1, do you--I believe you testified you omitted one of the lines coming in from the north that designated the Taylor Company

line; is that correct?

A That is correct.

Q This is a high pressure line?

A Yes.

Q What is the pressure in that line?

A I am not sure what the pressure runs all of the time.

Q Approximately?

A Basically it is a 500 pound system.

Q 500 pounds, and it could be higher or lower?

A Yes.

Q Generally in that vicinity?

A Yes.

Q Is that line connected to any Pictured Cliffs wells?

A I think there is one Pictured Cliffs well in that system.

Q Actually, aren't there two?

A Well, I only think there is one. There may be two. We made some special trade offs when we divided that system and hooked some Dakota wells to the low pressure, and hooked some P. C.'s to the high pressures, as a trade off in renegotiation.

Q I call your attention to the Breach F12 and the Breach F8, which are in Section 34 and Section 35, and 27 North, 6 West. Would you agree they are connected to your high pressure line?

A Would you give me those again?

Q Breach F27, Breach F8 location? 35-4 and 34 in 27 North Range 6.

A Yes, I believe that is correct.

Q Do you know anything about the ability of those wells to produce?

A Oh, in specific terms, no. They are about like the other South Blanco-P. C. wells in that Caulkins area. They are marginal wells.

I would have to look at the schedule to see if the schedule shows they are marginal.

Q You would agree to that, I assume, the official records of the Oil Conservation Commission?

A That is what determines the marginal wells, the official records of the Oil Conservation Commission.

Q And also the pressure in the pipeline, is it not?

A Not to my knowledge.

Q Not to your knowledge, but they are bucking 500 pounds more or less of pressure?

A They are bucking whatever is in the high pressure system, that is correct.

Q You don't know exactly what it is?

A It is around 500.

Q Now, turning to your Exhibit No. 2, Mr. Haseltine, that is a diagrammatic sketch of the compression installation at Dogie Canyon.

What, specifically, are the pressures on the intake and discharge side of those compressors; is that design pressure or actually working pressures?

A Those pressures that I have designated on that Exhibit No. 2, as I testified, I believe are approximately current operating pressures.

They represent a typical pressure. If you would go out there today, that is about what you would find.

Q Do you have then a pressure of 320 pounds coming off of the reciprocals and the two Solar compressors and an intake of 320 on the 300 hp Solar. Is that what you are--

A There are no 300 hp.

Q What is that 300 number for?

A 3,000. What was the question?

Q You have the same outlet pressure on your other compressor as you have on the intake side of the 3,000 hp compressor?

A Yes.

Q You have no pressure drop across there at all?

A There is some minor drop. We are talking about the typical normal pressure that you would find, sure, you have some drop through 15 or 20 feet of the line in through it. There is cooling equipment in between the discharge of the first three compressors and the suction on the fourth compressor, too.

Q You would have quite a little bit of drop then? When that

gas is cooled, the pressure drops, does it not?

A No.

Q It doesn't?

A No.

Q You mean the cooler gas has a higher pressure than the heated gas coming out of the first stage?

A Temperatures of gas is totaled independent of pressures of gas.

Q You have a pressure drop of at least five pounds across there?

A I will give you five pounds.

Q Thank you.

Now, you show the Largo line coming into the station.

You haven't given us the pressure on the intake side of that line. What is it?

A 320. That is what we showed in on there, through that manifold.

Q At the point you connect to your Solar compressor is 320 pounds?

A Yes.

Q This is your 500 pound line?

A 500 pound system.

Q 500 pound system. How do you get a pressure drop of 300 pounds from 500 on your upper end to 320 down here?

A That is not a 300 pound drop.

Q I didn't say a 300 pound drop. I think I said how do you account for the pressure drop of that magnitude in that system?

A Pressure drop is a function of flow and the size of the facility.

Q Well, what is the size of the facility?

A I think that is another 10-inch trunk that runs out there, but I am not sure.

Q So, you have considerably more of a pressure drop on that line than you do on your other ten lines connected to the Pictured Cliffs; is that correct?

A I suspect that is right.

Q Where is that line actually physically connected; is it connected at the compressor station or is it connected to a portion of your pipeline system as shown on Exhibit 1?

A Well, now, I don't understand that question.

Q Where does your Largo line come into this compressor system? Are you connected at the compressor facility at Dogie Canyon or are you connected to some portion of the Pictured Cliffs pipeline shown on your Exhibit 1?

A No, the Largo system comes in separately, the Dogie Canyon Compressor Station facility.

Q It is an entirely separate pipeline? There is a lot of inner-connecting, manifolding to provide flexibility in this Dogie Canyon Station?

A At the station, yes.

Q Now, Mr. Haseltine, how long have you been associated with and known about the problems that existed at this Dogie Canyon Station?

A Well, I have associated with the total operation, including the Dogie Canyon Compressor Station and all facilities in that area, why, for ten or 12 years.

Q And did you have anything to do then with the redesigning of the facilities there?

A Of the Caulkins area system?

Q Well, the Caulkins area system, the Continental area system, the entire system?

A Well, insofar as the gas supply functions that have been previously described, in the decision making process that leads to the purchase of facilities, yes, sir, I have some impact on that. Now, I did not design the equipment, nor did I place the order.

Q Now, how long have you known about Continental Oil Company's problems as they have been related to you in this respect?

A Continental first contacted us, I think, about last April or May. Now, I could stand some correction on that, but it was early in '71.

Q You don't recall a letter written in 1970, December?

A They wrote in 1970, December, asking about operations down in Belen, which is not part of this case. They may have

written something else in that letter, but possibly that was the earliest contact they made on this.

Q If we assume that it was, you would have known about their situation in 1970. When was this facility designed, as shown on Exhibit 2?

A When was it designed?

Q Yes.

A I don't know when it was completed. The concept was approved in the fall of 1970.

Q The fall of '70?

A Yes.

Q When was the system arrangement installed?

A We are still talking about the work that culminated--

Q Is that what you have got there today?

A Well, we have got to be precise about this. The work that is there today, some of it began many, many years ago.

Q Yes.

A Now, if you are talking about the construction that went on in the summer of '71, why then we can talk about that. I have to know what precise thing you are talking about.

Q Let's talk about the most recent construction, which I assume is the summer of '71. When was that installed?

A In the summer of '71.

Q What period, June, July, August?

A Construction work was under way generally in the months of,

I think July, August, September.

Q Now, did you or did you not know of the complaints Continental Oil Company had at the time this installation was proposed?

A At the time the installation was first proposed? And conceived?

Q Yes.

A No.

Q Did you ever look at the production situation on those two segments of your line?

A Certainly.

Q Before you designed this?

A Certainly.

Q You didn't know that Continental had a problem, although you looked at it?

A We don't recognize that as a problem today.

Q You don't? I see.

You did recognize the pressure differential that exists between the two segments of the line at the time this installation was made?

A We recognized that pressure differentials existed going back to the time Conoco acquired the property.

Q And it still exists today?

A Yes.

Q As far as you are concerned, you hope it will continue to

exist; is this your testimony?

A No, I don't hope the pressure differential does or does not continue to exist.

Q Now, referring again to your Exhibit 2, I think you have already answered that question. I'm sorry. I will go to my next one.

You say these are actually working pressures that are shown on here and not design pressures?

A These are the typical pressures operating there today.

Q You testified that there would be a great deal of difffi-culty in revising the Dogie Station using the existing com-pressors?

A I testified there would be a great deal of difference in equalizing the suction pressure by simple manifolding across the three small compressors with the existing Dogie Caynon facilities.

Q Is there any other alternative than manifolding, as you describe?

A To equalize pressure?

Q Yes, sir.

A Not without substantial expenditures of money.

Q You testified you knew about the gathering system disparity as related by Continental before this system was installed?

A Yes.

Q But you didn't do anything about the curing of that

situation at the time you installed it?

A You didn't ask me a question.

Q Yes, I did. You didn't, did you?

A Well, I understood you just to make a statement that I did.

Q You didn't?

A If you are asking.

Q I am asking, did you?

A Certainly we knew the disparity between the systems. That is why we installed the facility.

Q I said you didn't do anything about curing the situation, did you?

A Well, I think we have testified that the equipment we put in.

Q Now, could you have not designed the system so that substantially equal pressures could have been established on these two segments of the line?

A We could have. In fact, we could have gone farther in design for a lower pressure on the east system.

Q You could have bought a larger compressor, could you?

A Sure.

Q Had you bought a larger compressor, it would have reduced the amount of work the other compressors are doing, would it not?

A Not necessarily.

Q Not necessarily?

A No.
Q Now, you just chose to ignore the pressure variation in the two segments; isn't that the fact?
A No.
Q You considered this, but you didn't cure it?
A Didn't cure the pressure?
Q Is this your testimony--I beg your pardon--you say you didn't ignore the pressure differential?
A No. We knew that the pressure differential existed.
Q Yes, but you did not cure that pressure differential, did you?
A In total?
Q Yes.
A No, we have never represented that we did.
Q I believe you testified yesterday that the maximum ratio of the centrifugal compressor is 1.75; is that the maximum design ratio as recommended by the manufacturer for the wheels that are in it?
A For the wheels that are in it.
Q Now, the Solar could have been installed on there, the Saturn compressor AC-16 casing that will accommodate this ratio?
A I don't know. I don't buy those compressors.
Q If the Solar could furnish such equipment with a compression range of 1.1 to 2.3, it would have considerably improved the

situation, would it not?

A Improved what situation?

Q You would have had a higher compression ratio and it could have reduced the line pressures in this system?

A You are talking about a lot of things besides design ratio. You are talking about hp, response of a system to lower line pressure. You are talking about cost. You are talking about a lot of factors. Now, to say that it would have alleviated some problems, you have got to kind of define the problem.

Q I think we have defined the problem. I think you have already testified you do not choose to recognize it as a problem, so we won't pursue that question.

Now, turning to Exhibit No. 3, that shows the average pressures. Did you come up with the average pressure for Continental oil well company's wells?

A This was prepared under my supervision, yes.

Q Now, did you make a computation of the total average?

A This is the average per well, as I understand it. Of the total average?

Q Yes, sir. You testified yesterday, I believe, just to refresh your recollection, that Continental wells averaged during the month of November 282 pounds?

A Yes.

Q And in December, 273 pounds?

A Yes.

Q What is the average for Caulkins for that same period?

A I don't have that number.

Q What is the average for Southern Union Production for that same period?

A I don't have that number.

Q You didn't choose to compare the pressures in the system?

A No. Be glad to make that computation. It is not tough. You add them up and divide by the number of wells.

Q You agree that just changing the pressures shown on your exhibit, the average would be somewhat lower for both Caulkins and Southern Union?

A Average?

Q Average.

A Yes, we have testified to that fact.

Let me back up here. If we are talking about Production Company wells on the top end of the Ballard System, yes; if you are talking about Production Company wells in the Tapacito area or Jicarilla area, why the Continental wells are--no, I'm not ready to agree that the Continental wells are particularly facing a higher pressure than those same group of Production Company wells are. They are all feeding the same system.

Q When you are talking about the same group, are you talking about the Pictured Cliffs or the Tapacito?

A I am talking about the South Blanco-Pictured Cliffs wells. This system is still called the Tapacito or Jicarilla system.

Q The Navajo Indian wells are in the Ballard system and have lower pressure; is that correct?

A Yes. Let's look at that exhibit to see we get this matter straight here.

Q O.K.

A Exhibit 3, the Caulkins wells, feed the Jicarilla system--pardon me--the Continental wells feed the Jicarilla system, and they do exhibit pressures in the range of 282 and 273 for the months of November and December.

The Southern Union Production Company wells that are all named Jicarilla wells, there are probably 20 of them or 25 of those, are in the same Jicarilla system with Continental wells, and their average pressure for the months of November and December would be at least as high, possibly higher, than the pressures at which the Continental wells are flowing.

Q Tell me, Mr. Haseltine,--

A If I may, we haven't finished what you brought up here on this exhibit, the Navajo Indian wells belonging to Southern Union Production Company produced to the low pressure systems as to the Caulkins wells and the average producing pressure on those wells, both Caulkins and the Southern

Union Production Company Navajo wells would be a lower pressure for the months of November and December than the comparable pressure for Continental and Southern Union Production Company Jicarilla wells.

Q It is your testimony you are furnishing different facilities for Continental and Southern Union than you are furnishing to Caulkins and the Navajo wells operated by Southern Union.

A Different facilities?

Q Yes.

A Yes, we are furnishing different facilities.

Q Now, if you were required or if you did reduce the pressures available to Continental Oil Company to the 200 pound area you would pay no more for the gas, would you?

A No more than the price paid?

Q Now?

A As long as they are in the 200 to 300 pound bracket they get a price.

Q If you got 290 pounds, you are paying the same price as if you had 210 pounds?

A That is right.

Q A 90 pound reduction in pressure wouldn't make a difference in price of the gas?

A Only if you are dropping from 200 to 210. If you are dropping 350 to 240--

Q It makes a difference?

A I think probably Continental has still one or two in the 300 pound bracket. I see a November reading of 300 on several of their wells.

Q Now, referring to your next exhibit, Exhibit No. 4, did you average those pressures?

A They were done under my supervision.

Q But you didn't make an average for each of the operators involved here, did you?

A No.

Q Wouldn't that be a significant factor in dealing with different operators as you were doing in this field?

A The reason I developed some averages for Continental was not to compare at that point the difference between their pressures and some other operators. The purpose was to show the continued decline in pressure and volume that is occurring in production from their wells.

Q We will come to volumes later, but we showed from, on your two months, two reading pressure drops of about ten pounds on Continental wells; isn't that correct?

A Yes.

Q At the same time, would you agree, that Caulkins shows a drop from 201 pounds to 194?

A Well, that is possible. I would just have to add those two columns, divide them out, and see.

Q If we had averaged that, would you say that sounds reasonable?

A It sounds reasonable. I am not going to argue that it is wrong or right.

Q So we still have a pressure differential between the two operators?

A Yes.

Q Now, on Exhibit No. 5, which is the production for 1971, could you estimate what Continental Oil Company's production would have been if the pressures had been the same as those afforded to Caulkins?

A No, because we have dropped the pressure substantially on Continental wells and production is still falling.

As I testified yesterday, I don't know whether it is going to bottom out.

Q Would you agree that with reduced pressures Continental would have produced more gas?

A That is precisely just what I just got through testifying to. We have reduced the pressure itself.

Q They have produced more gas, have they not?

A More than what?

Q More than they were producing before you reduced the pressures?

A No. November was more than they produced, let's say last January or February, but December, with a still lower line

pressure, was less than they produced in November.

Q Now, let's skip over to Exhibit No. 7, Mr. Haseltine. Just what do these figures reflect? I don't quite understand your exhibit here.

A These are the days that we provided a market for the wells indicated in the tabulation.

Q Now, if you say a well was on the line thirty days, whether it produced any gas or not, you considered it on the line, fed to your facility, and the well was exposed to your line?

A If it was on the market it got logged in with thirty producing days.

Q If it was bucking a 400 pound pressure and it had 450-pound well-head pressure of its own, it was producing?

A Well, if the chart was marked, it was producing.

Q If the chart weren't marked, did you consider it producing?

A If it was open to our line.

Q That was a producing day?

A That is right.

Q Without one iota of gas going through the line?

A That is right.

Q I see. Let's take your two exhibits, 6 and 7.

Now does that actually show there was a reduction in production from Conoco's wells?

A Six and seven, yes.

Q Did you take into consideration in your conclusion that

Continental production went down the number of producing days allocated to Continental?

A Which exhibit are we talking about here?

Q You have your producing days on Exhibit 7, and you have got your production on Exhibit 6.

A Well, no, not for the same time period.

MR. PORTER: I believe Exhibit 6 shows the first two weeks in January, perhaps.

Q (By Mr. Kellahin) Let's go back to Exhibit 5 then. Now, have you computed the number of producing days? You haven't made any comparison of production days against production, have you?

A You are going to have to tell me which exhibit. I have on some. I have not on some.

Q You show me an exhibit you have done that on.

A Let's take Exhibit 6.

Q All right, sir.

A They had 1,957 Mcf per day. That takes into account days, for the chart of January 1, and on January 9, they had 1,954 Mcf's per day.

That takes into account the days.

Q This is an average of the production; isn't that correct, is that what you are talking about?

A That is a per well--pardon me--that is a per day total for Continental's leases.

Q How do you arrive at a per day total?
A Per day average, pardon me.
Q Per day average.
A Right.
Q And if Continental wells produced 29 days, you would have the average for the 29 days; is that what you are saying?
A We are talking about Exhibit 6, we are talking about seven producing days in one column and eight in the other.
Q You averaged that seven days and the eight days?
A Right.
Q Now, you didn't use this average for all of the wells; isn't that correct?
A For all of the Continental wells, yes.
Q And all of those on Exhibit 6, you show only Continental, you show all of the other wells, too?
A I show all of the other wells.
Q You would have to take your average per well day and divide that by the number of wells, would you not?
A All right. You could do that.
Q Yes, sir.
A I did not do that, but you could.
Q You did not do that?
A No.
Q If you did that, would you agree it would not reflect a reduction in Continental production?

A On a per well basis?
Q On a per well per day basis, that is right.
A There would be a small increase, but let me point further here, because we testified on exhibit--is it nine?--that has got the pressures on it. No, Exhibit 4, that the line pressure from that first chart period of Exhibit 6 dropped 11 pounds, so what I testified to on an average day showed a very small, from a 1,957 Mcf per day to total, the 1,957 Mcf total, very small decline.
Q What you are saying if you divided by the number of wells, it would have shown a slight increase in those two chart periods?
A That is right. There was an 11 point drop in pressure to which these wells were producing.

The significant thing is the size of the pressure drop as compared to essentially no change in flow rate from the Continental wells, whereas there should have been an increase.

Q You should have made such a computation for the month of December to compare it to these two 7 and 8 day periods?
A Divided all of the way down to per well day?
Q Yes, sir.
A No.
Q You don't know whether actually on a per well basis there were reductions on the increase, do you?
A Well, I think I do, but I'm not going to say that I do.

Q You think you do?
A I think I do.
Q You don't want to testify to it?
A No, sir.
Q Now, turning to Exhibit 9, that shows only Continental wells; isn't that correct, that is Continental wells, and that is all; is that correct, Mr. Haseltine?
A Yes, that is correct.
Q Now, the last one on the list, Lease-0, that is only a one well lease, is it not?
A Yes.
Q It shows an increase in production from 47 to 48, from January 1 reading to January 9th reading?
A Yes.
Q Let's go back up to other leases, the J lease, for example. Didn't that show an increase in production?
A Yes.
Q An increase of two Mcf's per day?
A Yes, sir, 26¢ worth of gas.
Q Yes, at your rates. On the L lease, the is 38 Mcf increased to 46 Mcf per day?
A Yes.
Q That is a few cents more?
A That is $1.35 more.
Q Over a period of time, though, that could amount to a

considerable amount of money?

A Yes, if it had held up.

Q There was an increase on in-weeks?

A Yes.

Q But your testimony is your production declined. That was the purpose of your exhibit, was it not?

A Wait a minute. Did you give me the exhibit on the M Lease?

Q The M?

A The M Lease.

Q The N-Lease, I should have said, shows an increase.

A The N-Lease went up two Mcf's.

Q Yes, sir.

A So, we could show a total increase of 12 Mcf's per day on those three wells on 10-20-31, 12 Mcf's per day.

Q But your testimony is production declined during this period?

A Again, I pointed out that with an 11 pound drop in pressure there was no substantial increase or response of the wells to an 11 pound drop in pressure.

Q Would you expect a substantial increase on an 11 pound drop anywhere else in the Pictured Cliffs Formation?

A There will be some response. If there is going to be any for 111 pounds, there should be some for 11.

Q On a ratio of 11 to 111, is that what you are talking about?

A Well, over a relatively small range, it is a directly

proportional thing, that is right.

Q Do you know whether or not this is proportionate to the major drop you made in your line pressure; have you checked that?

A Pardon? Is this proportionate to the 11 pound drop? We showed an increase in that proportion as to the 111 pound drop you referred to.

We don't know what increase is going to come out of 111 or 150 pound drop, because, as the exhibits have shown, from the time of October, November, and December on these volumes are generally falling off.

Q Mr. Haseltine, you will admit that your Exhibit 9, while it doesn't show any substantial increase, does note an increase in Continental's production; does it not?

A Yes, and there is another thing we need to point out here. The production is up and down on a given well, not only as a function of line pressure, but a function of how the operator is cleaning that well during that particular chart period.

Q You don't know anything about that either, do you?

A We have a witness who will testify to that.

Q Now, referring to Exhibit No. 10, are these pressures taken at the chart meter point on the Compression Station?

A Yes.

Q Well, now, in January of 1971 your pressures at that point

exceeded 600 pounds, did they not?

A You mean on those two peaks?

Q Yes, sir.

A Yes.

Q Yes.

A That was what was reported on our pressure information from the field that was plotted here. I don't understand that at all, and I really questioned the accuracy of that, but that is the information that we had to base it on, so we plotted it.

Q Did it--again over in May, it went to 500 pounds?

A It shows 500 on that one day. I don't know what happened. Maybe the compressors were down, or something else.

Q In general you show ranges during August and September from 350 to 400 pounds. That is when your compressor was being repaired; is that correct?

A That is when the construction work was underway, right.

Q But if we come back over into the months of July and June, you were still operating at pressures between 300 and 400 pounds a substantial part of the time?

A Right.

Q Now, what were the pressures in the Ballard line during this same period?

A I don't have the Ballard check meter plotted.

Q You don't?

A No.

Q What were the pressures in, I believe you call the Lowerie line, going to the north?

A Lowerie.

Q That is Exhibit No. 11?

A Yes. Well, in the early part of the year, they were running about 170, 175.

In mid-year they got up to 250, with peaks up to 400.

I believe those are the same time periods you were talking about earlier.

Q But in general during the months of January, February, March they were in the range of 175--

A Yes.

Q --pounds, as compared to a range of 300 pounds on the east line?

A Right.

Q That is a substantial difference in pressures, is it not?

A Yes, that is a substantial difference in pressure.

Q Mr. Haseltine, I want to talk with you some about Exhibit No. 12.

I am not sure I understand exactly how you constructed this, but it is my understanding of your testimony that you take your market requirements and you allocate them to the producer connected to your system; is this your testimony?

A That is about correct. At the first of the year we

estimate our market, and then allocate that down on a pool basis.

Then when you get to a pool level with that estimated market, you spread that out on the Commission formula of ASAD's to each well.

Now then as the year progresses and our market, which has been estimated on the monthly basis for the year, proves to be either high or low, we continually correct that so that our market requirements continually correct back to the actual production to the end that at the end of a year our market requirements, with minor exception of adjustments, that haven't come in yet, turns out to be with the field in total produced.

Q That becomes the allocation from this Commission to the pool; isn't that correct?

A From the Commission to the pool?

Q Eventually it becomes the allowable for the pool, does it not?

A Well, the Commission--

Q I mean, assuming you are the only operator in the Pool, I am saying--which you aren't, of course--but let's assume for the moment you are?

A Well, there is the theory of the proration system they use that continually corrects from the nominations or markets system back to actual take, that is correct.

Q Are you testifying that you make the allocation to individual operators; is this your testimony?

A For the purpose of our dispatching the various wells we have to make some sort of an allocation of our market to the individual wells because, contrary to the assumption we just made, we are not the only taker in the field.

Q Yes, sir. Now, on that basis, do you operate the wells on your allocation, or do you operate your wells on the allocation that has been made by the Oil Conservation Commission?

A We consider both. We know that none of the operators like to have allowables cancelled, and we try to operate in such a way that they don't.

We try to keep the total allocation in a given Pool spread out on what we have taken out of the Pool because it is our obligation to take ratably as to our own needs, not as to some other taker in the Pool, but we do consider and use every month the proration formula and allowable established by the Commission.

Of course, particularly the amount of allowable may be subject to cancellation.

Q Do you have a take or pay provision in your contracts?

A There is a take or pay provision in most of our contracts.

Q There is one in Continental Oil's contract, is there not?

A Yes.

Q Now, you do recognize the Commission proration system, which is based on 25 percent acreage plus 75 percent acreage times deliverability?

A Yes.

Q On that basis, how do you arrive at the allocation to marginal wells in this Exhibit No. 12?

A We allocate for the purpose of marketing, using the D's that are also on file. If a well has been marginal and normal, there is still a D on file. Now, if it becomes exempt, we use the last D and I's, of course, this accrues to the benefit of the producer who has the exempt marginal well.

Q Did you do that on the Continental wells on Exhibit No. 12?

A Yes.

Q You say that Continental is entitled to, I believe, 13 percent of the market?

A You are talking about which particular year?

Q Well, I don't recall what your testimony was. You said that Continental was entitled to 13 percent of the market and they got more than that. I don't know which year you were testifying on.

A I don't believe I said that they got--they were entitled to 13 percent and got more, because the only year in which their number is 13, they got less.

Q And how did you arrive at that 13?

A As I have just said, with taking into account the A & I's of all of the wells in the Pool, and are continued, corrected estimate of the market.

Q Now, Mr. Haseltine, didn't you in fact on Continental's wells look at the proration schedule and see what their allowable was?

A I have testified we used the allowable on all of these wells.

Q I am talking about on this computation, did you not use the allowable as reported by the Oil Conservation Commission?

A No.

Q Rather than compute a theoretical allowable fuel on the basis of deliverability?

A No, we spread it ourselves.

Q You spread it on the basis of the Commission formula?

A On the basis of their formula, right.

Q If the Continental wells were unable to produce any gas at all would their fair share of the market be zero; would they still have their fair share on your computation?

A Well, if their wells were unable to produce at all, I would hate to try to serve any part of the market from their wells, wouldn't you?

Q Yes, sir, I would.

A So their fair share of the market would be zero.

Q So, if they are only able to produce as marginal wells, is

their fair share of the market what they produce or what you compute they should produce? I am trying to find out what you used in this exhibit.

A It comes back to this for a well that will not make either its allowable or its allocated share of our market. It ends up staying on the line all of the time.

Q That is the figure then you have used on Exhibit 12, that is what I want to know, when you say what their share of the market is.

A As to the market requirement percentage.

Q Yes, sir.

A We are not talking about actual production percentage.

Q No, sir.

A We are talking about market requirement percentage.

Q Right.

A What they have computed in the original allocation as to their share.

Q Yes.

A Is based on their AS & AD.

Q You are saying they are entitled to 10.83 in 1969.

A Yes.

Q And they actually produced 13.1 for 75 in 1969?

A Yes.

Q Do you know what proportion of acreage Continental has in this Pool?

A Proportion of acreage?
Q Yes, sir.
A Not offhand.
Q Would you agree they have 26 percent of acreage?
A In this Pool?
Q Yes.
A No.
Q You wouldn't agree to that?
A No, because this Pool is very, very large, and Southern Union Gas Company only takes gas from a small part of it.
Q Now, on their deliverability, what percentage of the deliverability do they have?
A Of the total Pool?
Q Yes.
A I don't know, very small portion.
Q You didn't compute that either?
A You are talking about Pool gas? I think I have just got a little fraction of it.
Q I am talking about Southern Union's system only.
A I didn't understand it that way.
Q What percentage of acreage do they have that is connected to your system?
A Probably about 26, sounds like a good number, it would be 30-120ths.
Q They have 25. percent of the AD factor in the Pool?

A I do not know. I would have to tally that up and see.

Q You didn't make that computation in arriving at this 10.83 figure?

A I didn't specifically make that computation myself, but this allocation which is made under my supervision, I am sure somebody in the office did make that calculation.

Q What figure did you use in arriving at 10.83, Mr. Haseltine?

A The A & AD, as applied to their wells, applied against our estimated market. Our estimated market corrected to production entitled them to that 10.83 percent of the market.

Q Did you consider their A & AD's?

A Yes.

Q You did consider, if I am correct, the fact that they had 225. percent of AD's in the Pool, if that figure is correct?

A Yes.

Q You did take it into consideration?

A Yes.

Q You arrived at kind of a figure?

A That is right.

Q Now, what constitutes a marginal well in this Pool?

A One so classified by the Commission.

Q How did it get classified by the Commission?

A It wouldn't make its allowable.

Q Why do wells not make their allowables?

A Many reasons.
Q Name a few.
A One of them, the one you like, is high line pressure.
Q Yes.
A Wells that are watered out, they are not kept clean. They log off. Wells that are just very poor producers to start with, such that for some reason they got an allowable that they couldn't make, we have got wells like that in every pool in the San Juan Basin connected to everybody's system in the San Juan Basin.
Q You have got wells that water out?
A Some of them water out, but will never make their deliverable high pressure system, low pressure system.
Q You mean the high pressure is a factor; who controls the line pressure?
A The purchaser.
Q The purchaser does. Now, you say that can make a well marginal?
A No, I said "could make a well." Not "make its allowable," yes.
Q If it does not make its allowable, it is a marginal well?
A That is right.
Q So high line pressures can make a well marginal?
A They can make a well be changed in status.
Q Yes, sir.

A To a marginal well, but, you know, when the next team comes around and a deliverability is calculated, if I am not mistaken, the Commission takes that new deliverability test into account again, and they may choose to reclassify the well.

Certainly the operator under Commission rules has a right to come and ask that a well be reclassified if he thinks it is improperly classified.

This is what we are talking about here, we are asking wells be reclassified.

Q When you have a marginal well, how do you produce it?

A It stays on the line all of the time, essentially all of the time.

Q Regardless of line pressure?

A Yes.

Q If you let your line pressure go up to 500 pounds and we didn't produce anything, by your definition, you would still be taking care of that marginal well?

A If we let our line pressure go up to 500 pounds, I am sure that Continental would come to us and read the contract to us.

Q Yes, sir, and they have not done so?

A We haven't let the pressure go up to 500 pounds.

Q I am talking about have they not talked to you about the contract?

A No, they have talked about their complaints and wanted relief outside of the contract.

Q Well now, our contract says you can go up to 600 pounds?

A Yes.

Q We can still talk about 500 pounds and be within the contract, can't we?

A We have got to be careful that we don't find ourselves talking about one part of the contract and ignoring something else such as a provision we have got to provide a line pressure that will allow 80 percent of the wells in any given pool to produce.

Q Your operation when you have a marginal well on the line, do you in fact consider that well as being taken care of?

A If it is on the line?

Q Yes.

A It is essentially all of the time, yes.

Q You feel no obligation to reduce your pressure in any area to get the well back on a one marginal status?

A We feel no obligation to run out into the field area where there may be a particularly weak well that won't produce, and at substantial expense do things that are not required under our contract agreement with producers to install a producer to serve that one well.

Q Continental has 31 marginal wells; isn't that correct?

A I think that is right.

Q All classified marginal. Are those wells in fact marginal?
A If they are so classified, they are.
Q They are marginal, so all you have got to do is leave them on the line regardless of pressure and you have done your duty?
A No, we have to leave them off the line, and compression has to be that in accordance with the agreement between ourselves and Continental.
Q Now, Mr. Haseltine, are you familiar with the Common Purchaser Act, State of New Mexico; have you ever read it?
A Yes, I have read it.
Q It requires you to take ratably from all of the connections to which you are connected, does it not?
A That is right, and I will have to say that anything I say in regard to the Common Purchaser Act, you are asking an engineer to testify in matters of law, and I consistently get guidance on these matters from our legal staff. I will be glad to tell you what I think it says.
Q Let's say what the contract says. You testified on the contract?
A Yes.
Q It says you will take ratably with the other producers to which you are connected?
A That is right.
Q If you consistently maintain high pressures so that the

Continental wells cannot accumulate underproduction for which you would have to pay, have you taken ratably from Continental, as opposed to other operators who are in a more favorable situation?

A Again, you have got to read the contract in its entirety. The ratability clause does not stand alone nor does the pricing clause stand alone; nor does the pressure clause stand alone. They all have to be read and understood together.

The contract is one instrument, and this is the way we read and understand the thing, and in the light of my understanding, we have taken ratably with Continental.

Q Now, Mr. Haseltine, you heard the testimony yesterday to the effect that when you reduced your line pressures, 12 of Continental wells were able to produce an allowable that would have been assigned to a non-marginal well?

A Yes, I heard that testimony.

Q Do you disagree with that testimony?

A No, on a short-term basis they have produced as was testified.

Q But your line pressures for those wells were prior to that date marginal wells?

A They were prior to that date, they were marginal wells, that is right.

Q Mr. Haseltine, the Commission has adopted its Order No.

1670 under the terms of which it allocates production of this Pool.

Under the statues it is directed to, allocated on the basis that will enable each operator to recover his fair share of the market.

Now, pursuant to that they have made an allocation to the South Blanco-Pictured Cliffs Pool. If Continental wells are in fact, and at least twelve of them have been shown to be non-marginal wells at reasonable line pressures, then they must be reasonable or you wouldn't have put them in.

Haven't you usurped the Commission's authority in controlling the production from those wells in the past?

A You are going to have to give me that again. I didn't understand that.

Q Can you admit that the Commission allocates on the basis of correlative rights? You understand the term, do you not?

A Yes.

Q You have by your pressures made Continental wells marginal wells in the past?

A No, I haven't testified that we have done that at all.

Q But your line pressures did in fact keep them in marginal status?

A I wouldn't agree to that necessarily at all, either.

Q Well, do you disagree with the conclusion made by Mr. Mattes

yesterday that the reduction in line pressures enabled 12 of their wells to become non-marginal?

A They are not non-marginal until the Commission classifies them as such. They may not remain non-marginal if they fall off after that short-term compression test.

Q What did the compression test have to do with this?

A Well, if I understood his testimony, the compression test was the type that was used to develop this high rate of flow that resulted in wells possibly being classified non-marginal. That is not correct.

Q That is not correct. Mr. Haseltine, do you not recall a series of six exhibits? We have had three points on them, the mid-point being the production after you reduce your line pressure?

A I remember those.

Q And in twelve instances Mr. Mattes testified that point would be above the allowable in this Pool?

A In twelve instances?

Q Yes.

A He only had six charts.

Q I understand, but his testimony was twelve wells were capable of doing this.

Do you not recall that testimony?

A He kind of lost me in there.

Q Yes, sir.

A There may be twelve that have flowed at rates that if the rates are sustained would be non-marginal wells.

Q This had nothing to do with the well tests we are talking about?

A If they were not under this compression test, then, no, they would be tied to the fact that we lowered line pressure.

Q By lowering the line pressure you gave us twelve non-marginal wells?

A I keep trying to get this point across. I am not satisfied they are non-marginal after they are on the line three or four months.

Q Three or four months would create some underage?

A That is right, depending on if the Commission reclassifies it, how they keep books.

Q How long does a well have to produce to remain on a non-marginal status; how is it classified?

A If it makes its allowable once, I believe, during the balancing period it is subject to being reclassified.

Q One month?

A I believe that is right.

Q It remains in a non-marginal status until the next balancing period; is that correct?

A Right.

Q There again, if it makes it one month, it remains on a

non-marginal status through that period?

A That is about right.

Q Now, Mr. Haseltine, let's look at Exhibits 13 and 14. Those are your pressure gradients?

I believe you have made these on a different scale, haven't you?

A Yes.

Q Why did you do that? They are the same, purport to show the same thing, don't they?

A Yes, they do.

Q By putting them to the same scale to make them look as though the pressures were about the same on the two systems, don't you?

A No.

Q No?

A I don't believe anybody looks at the graph without looking at the numbers along the edge.

Q Let's look at the numbers along the edge. You show on Exhibit 13 that you start with a pressure of 200 pounds. Actually, that should have been 215, shouldn't it?

A On that particular day the pressure that was reported in to us was 200.

I would be glad to change it to 215. This makes this thing a little more favorable to me.

Q You show a very high pressure gradient to distance of--are

these miles?

A Yes.

Q Six miles, six and a quarter miles, roughly. The pressure gradient moves up pretty rapidly, does it not?

A That is right.

Q Is that the two 12-inch lines you have?

A That segment in there between mile post zero and mile post section .5, or whatever it is, includes the two parallel-- twelve goes a little bit beyond the, presently goes a little bit beyond the point of tie-in of the new--

Q How do you account for the high pressure gradient on that segment of the line as compared with the remainder of the line, which is a smaller line, is it not?

A Yes. If you refer back to Exhibit 1, you will find that six and a quarter miles puts you back out to about the middle of the Continental J-lease.

Now, beyond that point you have got several branches that begin to come into that system.

You have got one from Township 26-5 to the north, and you have got a complex from 26-4 that feeds into the system that turns south into 25-4, and that system in 25-4 is one that is plotted here on this graph, so what you actually have in this segment there, that last six miles leading into the Dogie Canyon Station, you have got a merging of a member of the gathering branches, and so the

gradient the last few miles of line is higher.

Q Do you mean those marginal wells, Continental wells in the J-lease are accounting for a good portion of that; is that what you are saying?

A No. Those Pan-Am wells in there are accounting for a good portion that have--

Q The Pan-Am wells are where?

A In the northwest quarter of 25-5.

Q And they are another five or six miles up the line, aren't they?

A No, they are right in there in the segment we are talking about.

Q In the northwest quarter of 25-5?

A Yes. Continental also has some pretty good

Q They are going in the same line?

A Well, yes.

Q Do you have any connections between the Continental J lease and your Compressor Station to any other source of supply?

A No. I will have to answer that question, again.

Q Do you have any connections to any other source of supply in that segment between the Continental J lease and the Compressor Station?

A Not between the Continental J lease, but in the same area with the J lease.

Q And to other operators as well as Continental?

A Yes.
Q That would also help cut that pressure gradient?
A Yes, all of the gas that goes into that system has its effect on the gradient.
Q Now, did you make a similar study of the pressures on the Ballard line?
A No.
Q You did not? Did you make, did you make a similar study of the pressures on the Lowerie line?
A Yes.
Q It did not have the same pressure gradient?
A No, it does not.
Q I believe you testified yesterday that the per mile gradient was about four pounds on the east line of the Jicarilla system?
A Yes, on my data, if we change that left number there to 215 instead of 200, it would be about three pounds.
Q You testified, I believe, that anything less, the gas wouldn't flow?
A You can get it down to zero and the gas won't flow.
Q But you have to have some differential?
A You have to have some differential.
Q You have about two and a half pounds on the Lowerie line?
A Yes.
Q You could operate this line on two and a half pounds, too,

could you not?

A Given proper expenditures of money, you could operate it on two and a half, maybe two.

Q Now, wouldn't this indicate that you should lower the discharge pressure at the Dogie Canyon Station where it enters your compressor?

A Lower it?

Q Yes, sir, to get a lower pressure gradient here.

A Lower the discharge pressure?

Q Well, the intake pressure at your compressor.

A Suction pressure?

Q Your suction pressure, on the first stage there?

A Yes, that wouldn't change the gradient.

Q It would not change the gradient?

A No.

Q It has the same gradient all of the way through?

A If the wells respond with more gas, you would have a steeper grade.

Q Now, does this, these two exhibits, indicate you are furnishing the same facilities to all of your producers connected to your system?

A We haven't testified that we are furnishing the same facilities to all producers.

Q You are not?

A No.

Q Now, the Largo line pressure line does not in any way connect with this East system, does it?

A Not until the East system has been discharged.

Q Into the compressor?

A At Dogie, right.

Q Now, you introduced, over objection, I might add, the contract yesterday which was with Humble Oil & Refining Company. That is the contract under which you are taking Continental Oil Company's gas, is it not?

A That is correct.

Q You have a provision in this contract governing the price which has a sliding scale on it related to line pressure furnished?

A Yes.

Q Do you have a similar provision in your other contracts?

A In all of this in the Jicarilla system.

Q All of them in the Jicarilla system?

A I am making one exception there. The Aztec contract predated that, but their contract is tied to the prices paid to the other producers there to see they get the effect of it.

Q O.K. Now, your exhibit shows that you are paying Exhibit 16--I am referring to at the moment that you are paying Aztec 13.3¢ in December of 1971, with the exception of one well, you are paying 13.8?

A Yes.

Q Actually, that is probably 13.25; is it not?

A It is 13.25 plus some tax reimbursement.

Q Now, you are paying Continental Oil Company 13.3¢ in December with the exception of a couple that you are paying 13.8?

A There are about four that we are paying 13.8 on.

Q So you are paying Aztec and Continental substantially the same price?

A Yes.

Q You are paying Caulkins Production Company thirteen cents?

A Yes.

Q What is their reimbursement; what are you charging them for compression facilities?

A Nothing.

Q Nothing. You are furnishing that to them for free?

A Well, not for free.

It is reflected right there in the price.

Q So you are saying then that the difference between 13¢ and 13.25 justifies you in treating Continental's wells as you have treated them?

A Well, apparently both parties to the contract thought so when it was written. They all signed it.

Q I am talking about today.

A Nothing confusing about it. I think that it is still

justified.

Q You think it is justified?

A Certainly.

Q Actually, you are paying now on most of those wells 13.25 and not 13.3?

A 13.25 plus tax reimbursements, which gets you up toward 13.3. I am not sure what the decimal is.

Q Your contract says 15¢ less the compression charge. Now, the tax reimbursement is something else again.

A The contract does speak to tax reimbursement.

Q You are paying tax reimbursement on all of your connections are you not?

A No.

Q You are not?

A No.

Q You are not making a reimbursement to the Caulkins?

A To Caulkins?

Q That is the only one?

A No, it is not the only one.

Q What others are you not paying tax reimbursements to on your Exhibit No. 16?

A I don't believe that McDonald is getting it on their four wells.

If they are getting it at all, it is so small it doesn't reflect when rounded off to a tenth, and the

Navajo Indian well of Production Company--I don't think they are getting the reimbursement because their reimbursement on a 13¢ price run is just a little over half a tenth, so it would always round up to 13.1, and I am just not real positive about whether we are paying tax reimbursements to McDonald Production Company on those Navajo wells or not.

Now, your question, of course, as asked is whether or not we were paying prices without tax reimbursement to the other operators.

We are paying prices without tax reimbursement to many operators, but I can only speak as to the South Blanco-Pictured Cliffs Pool as precisely as to Caulkins' system, I am just not real sure about the McDonald or the SUP Navajo wells.

Q Is this the price you are paying in the San Juan Basin for Continental wells?

A For what kind of gas?

Q For gas?

A No.

Q No?

A No.

Q Are you purchasing--is it your testimony you are purchasing from wells in the San Juan and Rio Arriba County at

higher prices?

A Yes.

Q Now, under the terms of your contract at page 10, you have a provision on minimum purchases. I think you said you have to take 80 percent of the well's capability; is that correct?

A No, that is not correct. That is not correct. What is correct, in our opinion, is the take provision.

Q Yes, sir. Turn to page 10, and I would ask you to read the first portion of sub-paragraph A under Section 1 or Section 2 of the Minimum Purchaser Provisions.

A Sub-paragraph A of Section 2?

Q Yes, sir.

A That is not the take or pay clause, you realize.

Q No, sir.

Article 12, Section 2, sub-paragraph 3. We will start there with Section 2.

"Buyer agrees that he will take gas from each well now or hereafter located on the subject lands and connect it to gathering lines at least ratably with its taking from all other wells producing from the same horizon on the subject lands or in the gas field in which said well is located, as such well may hereafter from time to time be enlarged and extended, which may from time to time be connected to buyer's gathering lines, it being understood and agreed,

however, that in complying with this ratable purchase undertaking may by prorating its withdrawals between wells on any basis which gives reasonable effect to the factors, among others of open flow capacity, bottomhole pressure, and the size and shape of the drilling unit, so long as the method of proration employed is uniformly applied by buyer with respect to all of the wells on the subject lands and all wells in the gas field in which seller's wells are located from which buyer is purchasing and/or producing gas from time to time, adjustments to effect such ratable purchases [illegible] to be made between wells at intervals of not longer than six months."

Q Does that section give any weight to the price you are paying for gas?

A Where?

Q Continental Oil Company.

A Yes. That section gives consideration to the price you are paying to take ratably with all other producers.

Q Where does it say that?

A Oh, all right. Let me back up a minute. What was your question again?

Q My question was, you have said that differences in facilities you are affording is related to price.

Where in this contract does it say you can take that into consideration when you agree to take ratably from

Continental Oil Company?

A Well, the whole contract reads together, including our right to operate our Gathering System at pressures up to 600 pounds.

Q I am talking about ratable take provision, Mr. Haseltine?

A I understand that you are, but you can't separate that out and make it stand on its own.

Q In other words, you cannot contract to take ratably without modifying it?

A As long as the ratable take provision is there in a contract, that includes provisions, other provisions that have all got to be read together.

Q What provision would you like to read with this?

A We would have to start with where it says "Natural Gas Purchase Contract," and end where it says "signed," by some vice president.

Q You haven't put your finger on anything that modifies this section; can you do so?

A I don't mean to be flippant, but the entire contract itself, pressure, pricing, provisions, all reads together, including we have a provision as to disconnection, this sort of thing. This has to be read together.

Q Can you point to anything in the contract specifically which modifies your agreement to take ratably from Continental oil wells?

A Let me just point this out: that the contract itself has to do with the provision we have just read, speaking in terms of taking ratably, and it says we can give reasonble effect to many factors, among others--

Q Does it say price?

A Well, "other factors" includes price, does it not?

Q Does it say price?

A Not specifically.

Q Now, this sub-section B provides that if you do not take gas from the seller's wells and drainage occurs, you will disconnect or release from the contract acreage; isn't that correct?

A Well, the sub-section B does pertain to that, that is right.

Q Has such a demand been made on you?

A Yes.

Q Now, the contract does provide that if we have under production, allowable under production, which you fail to take, you will pay for it, does it not?

A Yes, Mr. Kellahin. I would like to answer that question a little while that you were talking about, anything modifying that ratability take.

That sentence didn't end where I stopped reading, merely the sub-section ended.

Q Yes, sir.

A If you go on down that sentence doesn't end two-thirds down

the page. It says, "Price--" however, there are some phrases in there that modify that ratability taking.

Q Did any of them mention price?

A No, they mention compliance with the New Mexico Oil Conservation Commission jurisdiction.

Q This is exactly what we want you to do, Mr. Haseltine.

A Be glad to.

Q You have to either take or pay the allowable assigned to these wells.

A The take or pay clause--

Q Yes?

A --says that we will take or pay for the extent, not in fact taken, but six times the average amount of gas taken monthly from said wells. It is on a per well basis during the month of December, calendar year preceding January and February of the current year. It does not say that we have to pay for cancelled allowance.

Q You have to take six times the December production?

A Six times the average of December, January, February.

Q Now, there is a force in reserve clause which is common to the contract which makes them subject to all of the lawful statutes and rules and regulations of the Governmental Force?

A There is a clause, but there is probably a clause more specific than that that says this agreement is subject to

the land laws of the land.

Q Well, it would have to be in any event, would it not?

A I would think so.

Q Now, on Exhibit 17 I believe you showed some contract provisions, did you not, those are the contracts under which you operated this Pool?

A Those are the base contracts, yes, sir.

Q And all of them are an indefinite term, with the exception of the McDonald Oil Company, I think you show hereon, and Continental's oil?

A That is right.

Q Had you considered the possibility of renewing Continental Oil Company's contract at its expiration date?

A Well, we have had it pointed out to us that, by Continental, that gas may well be withdrawn from us at the end of this summer, and, of course, we considered it, because this is my own personal obligation to the company.

Q So you did consider the factor that Continental may not renew their contract with you?

A Oh, they have pointed that out.

Q You testified at some length yesterday, I believe, that the compressor installation would be extensive; that is correct, isn't it?

A Yes.

Q Had you considered any other alternative than installing

additional compressor equipment?

A For what purpose?

Q To reduce the line pressures on the East segment?

A Well, the normal way of reducing line pressure in any area are either with pipeline or compressors, and the engineers do, who do the specific design consider both, and usually, as is in the case in construction work we have been talking about in this case, they use both, they use compressors, hp, and they use pipeline to lower pressure in the area.

Q I believe you testified you couldn't afford for the remaining term of Continental Oil Company's contract to install any additional equipment to lower this line pressures?

A Not to specifically alleviate a problem that deals with gas that is going to disappear in three or four years.

Q Such equipment would not be confined to Continental Oil Company, though, would it?

A No.

Q It wouldn't be for their sole benefit?

A It would if we went in now and did some additional work.

Q You don't feel that you are penalizing even your own Jicarilla wells?

A We haven't had any complaint raised, anyone except Continental.

Q Yes, sir.

A Aztec is checkerboarded with them.

Q You have interlocking directors of Aztec, do you not, speaking of Aztec?

A Yes, we do.

Q You control Southern Union Production Company, do you not?

A The management of Southern Union gas is under Southern Union Production Company.

Q You aren't apt to have a complaint from yourself?

A I wouldn't know why not. Those people have not ever held back from fussing yet.

Q If you did install additional compressor facilities, over what period of time would you depreciate that?

A Those things are normally installed and set up on depreciation of about, I think, 10 to 12 or 15 years. I am just not real positive as to that number. We are talking about the gathering system?

Q Yes, the gathering system.

A Right.

Q This compressor equipment can be moved from place to place as needed, can it not?

A Well, at major expense, you are talking about not skid mounted units. You are talking about permanent installations, one with a lot of permanent piping and valving that goes into these things.

Q Do you anticipate you will continue to operate in the South Blanco-Pictured Cliffs Pool?

A Yes, as long as gases are producible therefrom.
Q Your company today is making connections to other sources of supply in the same area?
A Yes.
Q Compressor facilities would be available for those connections as well, would they not?
A If they were installed now, and they became--a time arrives when they were needed for something else, they could be put back into service to use for the sources you are talking about.
Q Tell me, does Southern Union need this little bit of gas that Continental is producing?
A Any kind of a need for gas is whether it is used or any other company has a dollar value on it, as I think everyone can well appreciate.

Given a limit on the cost of gas to our line, yes, we can use additional gas into that system coming out of that area, but everything has got a dollar top on it.
Q You are not meeting your present requirements, are you?
A Where?
Q Well, for example, Kerr-McGee, or at the Public Service Company of New Mexico?
A Kerr-McGee is certified to **buy the gas we purchase from El Paso Natural Gas Company.**

Public Service, yes, we are meeting our contract

requirements with them.

Q You made a trade with El Paso for natural gas, didn't you?

A We have some trades, but not for the purpose of serving Kerr-McGee.

Q Now, you recently made a contract to sell gas to El Paso in the area involved in this Application, did you not?

A Yes, we made a contract to sell them some gas out of this area. That account is subject to Federal Power Commission approval, and right at this moment, that looks like it is not going to come.

Q What kind of pricing did you apply for?

A For a half cent above our cost of the gas.

Q Nineteen and a half cents?

A Given a 15¢ cost, it was four and a half, about, above the cost. That is what the price was.

Q I believe yesterday you testified that Continental Oil Company shouldn't be permitted to take a portable compressor out to the field and thereby increase their D-factor, or deliverability for the purpose of allowable; did you not testify to that?

A I don't recall exactly how my testimony went, but it was to the effect that no one should be allowed just to run around the field with a portable compressor and get a high test run off down the road with that compressor.

If they are willing to increase and sustain a

deliverability out of that well, that is fine and wonderful. I would be glad for Continental to do that on all of their connections.

Q Can you point to any single bit of testimony or any exhibit we offered here which indicated we increased our D's by these tests?

A That you increased your D's?

Q Yes.

A By the test?

Q Yes, sir.

A I think that the other witness testified to that.

Q Didn't you testify that some went up and some went down?

A Well, I thought the thrust of his testimony was that generally they went up.

Q Mr. Haseltine, just to refresh your recollection, wasn't he talking about the cost or production, the flow rate from these wells?

A He was talking about that, but I think he is talking about the D's, also.

Q But, you are not positive, are you?

A Well, I am not positive as to his testimony, but as a matter of fact, I think that the D's did go up as a result of those tests, did they not?

Q As a matter of fact, Mr. Haseltine, they did not, and we will be happy to put another witness back on to testify to

that.

A Fine.

Q I believe you will recall, will you not, that the test data the witness testified that the test data was not filed with the Oil Conservation Commission until this hearing?

A Yes, I remember that.

Q So, it couldn't be used for allowable purposes?

A So far.

Q So far?

A Right.

Q Mr. Haseltine, I would like, if I may, to return to the exhibits on the gradients on the two lines which are Exhibit 13 and 14 for a moment.

A All right.

Q Now, on Exhibit 13, the Jicarilla line, would you estimate the gradient on the first six miles of that line?

A Oh, it looks like it would be fifty pounds in about seven miles. That is seven pounds per mile, maybe seven and a half.

Q Now, are you using the starting point of 215?

A No, I am using 200, which is my data.

Q Can you estimate the gradient on the first six miles of the Lowerie line going to the north?

A It would be about--oh, it is probably between one and two pounds per mile on that plotted one.

Q The pressure gradient on the Jicarilla line, the first six miles, is really closer to ten than it is seven; isn't it, or maybe I can't read your graph?

A No, I was using seven miles there, it is six and a half plus, and at seven miles you are at about the 250 pound level, so you have got a Delta-T of 50 pounds in seven miles. I said seven or seven and a half, give you half a pound on it.

Q You say seven and a half as against one and a half on the other?

A Yes.

Q That makes the hydraulic gradient on the first six miles of the Jicarilla line how much?

A Whatever seven and a half is, about five.

Q The Lowerie and the Jicarilla, isn't this the same Jicarilla line you said you just finished looping with another well line?

A That is right.

Q What size loop would you have had to install to give the same pressure gradient as the Lowerie line?

A I don't have a Panhandle Flow Line Formula with me.

Q You don't?

A No.

Q You don't know it offhand?

It would have to be substantially larger than what you

installed, would it not?

A I would imagine so, yes.

MR. KELLAHIN: I believe that is all I have. Thank you.

MR. PORTER: I think you had the witness longer than Mr. Jameson. Maybe we can call him your witness.

MR. JAMESON: I have one or two re-direct questions, Mr. Porter.

RE-DIRECT EXAMINATION

BY MR. JAMESON

Q Mr. Haseltine, Mr. Kellahin referred to the system of designing the pressure differential in his questions on cross-examination.

I will just ask you if this was, if any considerations are given to the contractual pressure requirement in initial design of gathering systems?

A The two factors that go into initial design of gathering facilities are contract pressures and expected volumes available. These are the two perameters used. Contract pressure is just absolutely essential. That is what you design on to start with.

Q When you design on contract pressure you presumably designed on a pressure basis that was acceptable to the seller or you wouldn't have signed the contract?

A That is right. After the contract is signed, everybody

goes forth having made a satisfactory agreement.

Q Reference was made on Exhibit 10 to some kickers in the graph showing abnormally high pressures for a day or two on the line represented by that graph.

I will just ask you this question:

Is it possible for wells that are making hydrates to cause pressures in the line that will cause a pressure build-up for short periods of time, until a freeze is remedied?

A That is right. Now, of course, this pressure is taken down there at the check meter point, so hydrates would have to be between there and the station.

I don't really know what this was.

It may have been improperly imported or it may have been the compressor, or down-time, or something. In answer to your question, yes, hydrates will form in a line where three factors are present: natural gas, water, and turbulence, and given the right conditions of pressure and temperature hydrates will form and plug a line, cause high pressures at a well, and cause a well to lose production.

Q Now, Mr. Kellahin asked you a question as to whether line pressures other than those paid to Continental were paid by Southern Union for other gas in the San Juan Basin.

Could you briefly outline the differences on which those price differentials are found?

A They are precisely the same as reflected in the Continental contract, a right to gather gas at pressures up to 600 pounds.

In most of our high pressure, high price contracts in the Basin we do not have the provision for lowering pressures and lowering price simultaneously.

That feature is characteristic only of this whole Jicarilla area, and, of course, all of the contracts in that Jicarilla area carry that same pressure price reduction pattern, and the contemplation originally, and as it has been since implemented, was that the system would operate at high pressures to begin with, with a gradual lowering as contemplated by the contract.

Q Now, the higher prices paid generally are applicable to the Mesaverde and the Dakota formation in recognition of the higher pressures of those formations?

A That is right.

MR. JAMESON: I believe that is all.

MR. PORTER: Anyone else have a question or two?

MR. UTZ: I would like to clear up one column of figures, possibly two columns of figures on Exhibit 12.

CROSS-EXAMINATION

BY MR. UTZ

Q The first column is an Mcf and the second column is, of course, in percentage in regards to your market requirements.

Now, my question is, in the first column do those figures represent the Oil Conservation Commission--in the first column, do those figures represent the Oil Conservation Commission allowable?

A No, not entirely and not exclusively.

They reflect our consideration of the allowables, but that number is the ultimate division of our market.

Q In other words, they reflect a portion of your purchases or your market demands on your system and do not reflect the allowable figures for the whole Pool?

A Well, they do reflect that to the extent that I have tried to explain, the allowable for the whole Pool, because the allowable for the whole Pool, as we both know, is divided down into individual wells, the allowable that falls on the given well is reflective of our market plus the market of another purchaser.

Now, then at that point a well accrues underage or accrues allowable subject to cancellation, or it becomes over produced, depending on the allowable assigned to that well by the Commission.

Now, that then bears on our allocation of gas to that well, too, but the ultimate allocation after that is on our market, because that is really all we have to allocate.

Q In other words, on a per AD unit or for a well it is pretty hard to guess what a unit is in our proration formula up

there, but let's say that a well with a hundred deliverability, an acreage factor of one, these figures would be lower because your overall market demand is lower than the Pool allowable?

A I don't know whether our overall market demands in the South Blanco currently or in recent time has run under our allocated share of the market, either. If what you are saying is right, if it is not, what you are saying would be the opposite.

Q Would you use these figures in column 1 to determine this?

A Yes, that is right. I just have to check back. I don't know whether that has been the case or not.

Q You don't know whether they represent our allowable assigned by us or whether they represent your market demands?

A They ultimately represent our market demands, since that is all we have got to allocate.

Q Now, a question came up in my mind when I looked at Exhibit 2, your plat of compression. Do you know whether or not, of course, I am sure you know why I am asking this question --you have an inlet pressure of 165 pounds on your reciprocal compressor. On your two Solars you have intake pressure of 215 pounds. Do you know whether or not the system that goes into the Solar compressors on the basis of allowable is ratable with allowable taken on your reciprocating

compressor on the Ballard and Lowerie systems?

A Yes, I believe that it is ratable with the allowable assigned by the Commission.

Q In other words, you think the 215 pounds is giving you ratable takes in accordance with the allowable the Commission assigned as your 165 pound pressure?

A Yes. This goes back to the question you asked a minute ago. I didn't--I think I mentioned this--but I may not have made it clear. When we take our total market and divide it down to a Pool

Q Yes?

A We are dividing our market to a Pool, and we consider many things, what kind of an allowable that pool will get from the Commission. So our original market allocation to a pool tried to take into account about what our allowable is going to be. If we didn't do that, we might end up allocating a piece of our market to a pool where we are not going to get allowable to cover it.

On the other hand, the allocating to a given pool, and end up with a lot of cancellations to the original and to allocation, includes our consideration of what we think that allowable is going to be, of course, this is an in-house thing. We can shift our market from pool to pool with some flexibility, not a great deal, but some. As the year progresses, if the allowables are all accumulating

here and not accumulating, that sort of thing.

Q Your policy is you try to take the Commission allowable?

A That is right. We try to accommodate those, and in years gone by we had substantial cancellations. We try to get a cancellation ratable, too. That has not been the case in recent time.

Q So, in order to take ratably, if this involved putting in some more compressors, it would be your policy to do this in order to take the Commission allowable?

A No, Mr. Utz, we have not heretofore installed facilities on the basis of what allowables might be needed to be in the future.

We have installed facilities based on what the gas is going to be in total out of a given area, and what kind of pressure we can get it at, or we have to do to get it. This is what determines our installation facilities.

Q Well, perhaps you misunderstood my question. Specifically, let's look at the well, let's look at the Ballard and the Lowerie system over here. If you were not on that system, if you were not taking Commission allowables or you were taking much less of the Commission allowables, would it be your policy to increase your compression there so that you could take the higher percentage of the Commission allowable?

A Not just for that purpose. It would have to dovetail with all other factors that go into it.

Q Your contracts?

A Our contracts, our market, the whole thing.

Q I think that answers my questions.

MR. PORTER: Any other questions?

MR. STAMETS: Yes.

CROSS-EXAMINATION

BY MR. STAMETS

Q Mr. Haseltine, assuming that you were assured of Continental gas for as long as you would like, do you think Southern Union would have any objection to installing the additional facilities on the Jicarilla line to reduce the inlet pressure at the Dogie Station?

A This is a tough one to answer because when you assume that Continental is willing to extend a contract, that is a big assumption. It is not just for Continental, either, but we are all familiar with this total price picture in the San Juan is squirming around, and no one knows today what that price picture is going to be five years from now, and neither Continental nor any other prudent operator, if they can avoid it, is going to lock themselves to a long-term price here in the spring of 1972 when they can get this picture out for two or three years, hope they see which way that price thing is going to go. It is not just Continental in that respect. It is all producers, so to ask me to assume that Continental would extend that contract, that is

a real tough assumption to make, because that assumes you have agreed as to the price provision and many other things.

I just can't conceive that they would be willing simply to extend this Commission contract life of the lease because they are in the same position most operators are. They think that there is going to be a substantial price change in that area. They are probably right.

Q That wasn't exactly the answer I was hoping for. What percent of the Jicarilla line through-put comes from Continental wells?

A Well, they are shown here on Exhibit 2.

Q I am not just speaking about the South Blanco-Pictured Cliffs. I am talking about the total Jicarilla line.

A That Jicarilla line carries about 48 million per day, and Continental wells put out about a million and a half a day, I believe is the number, say three percent of the through-put.

Q Are there other leases connected to this Jicarilla line which could ultimately justify expense of installing all these additional facilities that have been discussed?

A Well, that is a guess. Either one of two things is going to happen, either volume available out of that area will decline, which will result in a decline in the Gathering System pressures to the end that no further hp is needed; or in order for us to get the reserves out we would have to

put in a horn, one or the other.

We don't know which today. No one can guess today which is going to occur, but the field has got a real long, protracted life such that if the volumes are going to dwindle down to a very minor amount we may have more hp than we will need five years down the road.

In other words, it may be that the wells will prove to be responsive enough, and with substantial reserves to the extent that it will behoove us to put in additional compression to get the gas at a higher rate.

In either event, regardless of if we knew which way to guess today, you are talking about installing of facilities that wouldn't be needed for some years down the road.

MR. STAMETS: That is all.

MR. PORTER: Any further questions?

The witness may be excused. We will take a ten minute recess.

(After recess.)

MR. PORTER: The hearing will come to order, please.

MR. JAMESON: The next witness will be Mr. Alvin Dean.

MR. PORTER: Come up and take the witness stand. I believe the record will show he has already been sworn.

ALVIN DEAN

a witness, having been first duly sworn according to law, upon his oath, testified as follows:

DIRECT EXAMINATION

BY MR. JAMESON

Q State your name for the record, please.

A Alvin Dean.

Q And are you employed by Southern Union Gas Company?

A Yes, sir.

Q And in what capacity?

A Field Superintendent.

Q In what area?

A In the Jicarilla area.

Q How long have you been employed in that position?

A In the superintendent's capacity five years; prior to that field foreman for three years.

Q Could you describe generally what your responsibilities and duties and work is with Southern Union in the capacity of Field Superintendent?

A Generally it is supervising installation, operation and the maintenance of gas gathering facilities in the Jicarilla area.

Q When you speak of the Jicarilla area, does that area include the South Blanco-Pictured Cliffs Pool?

A Yes, part of it.

Q When you say "part of it," now what part are you referring to?

A The portion of the line that we have been describing as

going west over to it. On the Ballard system I have no control on it.

Q Have you had the occasion to become familiar with the Continental wells connected to the Gathering System under your supervision?

A Yes, sir.

Q I will ask you this question: Has liquid in the Continental wells affected delivery of gas from those wells into the Southern Union Gathering System?

A Yes.

Q In what way?

A The liquid accumulating in the well bore itself, if it is not relieved, will definitely hinder the flow of gas, and it can naturally cause measurement problems and line freezes or hydrates, if you will.

Q Can that liquid actually accumulate to the extent, and has it done it in the past to the extent that the entire flow of gas from the well into the Gathering System is cut off?

A I wouldn't necessarily say cut completely off as a result of liquid in the well itself, but the flow has definitely been hindered, I will put it this way.

Q Does that liquid in the well often cause a freezing up of the well?

A Yes.

Q When a well freezes, does it deliver into the line?

A No.

Q Has liquid in the Continental wells caused any freezing up of the lateral line of Southern Union connecting the wells?

A Yes, sir.

Q There has been some flow of liquid from the Continental well that ties into the Southern Union gathering line connected to the well?

A That is right.

Q And when that happens, what happens to the flow of gas from the well?

A It can block off an individual well line or gathering line and possibly enter the Gathering System.

Q Now, what action do you and the people under your supervision take when those line freezes occur?

A Depending on the circumstances of it, generally it is easier just to shut a well in or all of the wells on the Gathering System, and relieve the pressure, allow it to be atmospheric pressure. Your hydrates will come unfrozen if it is a hydrate freeze.

If it is an actual water freeze, this is about the only way you can do it, leave it down until the freeze comes out, or you can inject methanol to help alleviate the problem.

Q Would you say that these lines freeze because of the hydrates produced from the Continental wells occur

frequently or seldom, or with what frequency?

A Oh, I suppose you could classify it frequently, yes, sir.

Q Now, what has Continental done with reference to alleviating the liquid problem in their wells?

A They have installed on a number of wells over the past years intermitters to automatically relieve the well bore of the accumulated liquids, and on two or three occasions they have went in and reworked the well. I think possibly they installed a smaller tuck, but I am not certain.

Q Now, how many of their wells, to your knowledge, have intermitters installed on them?

A Approximately 17 or 18 of the South Blanco-Pictured Cliffs take off.

Q Right off the south?

A Possibly 17 or 18.

Q Out of 31 Continental wells?

A Right.

Q How do those intermitters work?

A They are generally a pneumatic-actuated valve controlled by a time cycling device.

Q Are they actuated by a clock?

A Yes, sir.

Q How many days are those clocks usually wound for?

A Eight days generally.

Q The people under your supervision found those clocks to

have been run out, not been rewound by Continental at times?

A Yes.

Q Would you say that occurred frequently?

A Quite frequently.

Q Have you experienced or observed any delays between the time that a Continental well is logged off on account of water and the time that Continental's personnel have blown the well down to try to alleviate that situation?

A Yes, sir, I have.

Q Let me ask you this: Have the people under your supervision when they find those intermitters wound down volunteered some assistance to Continental and rewound them for them?

A Yes, sir, they do when they have time or if a well does not have any intermitters on it, they will on occasion clean the wells themselves to prevent us from having measurement and line problems.

Q Even though we consider that those activies are duties of the operator regarding the operation of his wells?

A Yes, sir.

MR. PORTER: Isn't that in violation of union regulations?

THE WITNESS: It is also in violation of company policy.

Q (By Mr. Jameson) In your conversation with Continental personnel operating these leases, have you obtained any

information as to how many people they have got employed in this area to operate their wells?

A So far as I know, they have three field personnel in the area.

Q How many people, how many wells are those three people trying to operate?

A I really don't know.

Q But they do have other wells other than those connected to the Southern Union system?

A Yes, sir, they do.

Q The question that arose yesterday in the testimony as to the piping arrangement that Continental employed on their portable compressor when they were running compressor tests, can you describe that for us?

A On two of the wells for sure, the Continental Jicarilla or the Axi Apache J-1, and J-2, and also, I am sure, on the Continental M-1, they did have a suction line coming out of the tuck and a discharge line coming from the discharge side of the compressor back into the casing, with a pressure controlling device installed on the tuck, and the motor valve on this discharge line where the suction on the tuck failed, it would be open, it would open this motor valve and allow a discharge of gas in to circulate into the casing of the well.

Q With what effect on the arrangement, as far as keeping the

well clear of liquids during the freeze period?

A It could quite easily circulate enough gas to lift accumulated liquids of the well, and thereby keep it clean.

Q In other words, they would get the best production rate through that arrangement, unaffected by liquids, than they would get if they didn't pipe that gas back into the well casing?

A Yes, if they had enough circulation.

MR. JAMESON: I believe that concludes our direct testimony.

MR. PORTER: Mr. Kellahin, you have some questions?

MR. KELLAHIN: Yes, if I may.

CROSS-EXAMINATION

BY MR. KELLAHIN

Q Now, Mr. Dean, you referred to an instance where Continental lines froze up. When did this occur?

A It occurs at any time when the liquid comes out of the wells, or any of the Pictured Cliffs wells, with the exception of one or two. They have no dehydration facilities on these wells, just separation, which separates free liquid, and then is accumulated in our gathering line--naturally it will freeze up.

Q You testified that it did occur; when did it occur?

A It occurred quite often.

Q What do you mean by often?

A We remove on the Continental wells probably a freeze or two a day.

Q All through the year?

A No, sir. In the winter time.

Q What time of the year?

A Generally the freezing starts in October and will extend through say March or April.

Q When and where did you remove a freeze on a Continental well?

A I haven't personally removed a freeze from a Continental well.

Q Have you personally seen a freeze?

A Not for a number of years, but I have personally seen freezes--

Q Where?

A --removed from all of our Continental Axi Apache L leases, L, N, O, J

Q The O Lease was frozen in?

A No.

Q What well was frozen in and when, do you know?

A Yes, sir, on the K lease, in particular last year we had a number of gathering problems. It could have been contributed to the Continental well or Southern Union's, either one, or Aztec's.

Q You don't know whose they were?

A No, sir.
Q So you can't name a single instance where you had a freeze on a well at a given time?
A If I had the charts available, I could show you a number of wellhead freezes and freezes between the wellhead and the meter and immediately
Q You testified Continental had intermitters, I believe, on 16 or 17 wells?
A Perhaps that many.
Q Generally the Pictured Cliffs Formation is productive of water in this area, is it not?
A Correct, yes, it is.
Q Do all of the other operators also use intermitters?
A All of the other operators, most of them.
Q Not all of them?
A A few do, yes.
Q How would you compare the water problem of Continental's oil leases with the water problem say on the Caulkins leases; don't they have a water problem, too?
A Yes, they do.
Q Do they use intermitters?
A No.
Q They don't?
A No.
Q The size of the water problem is important as to the flow

rate of the gas, is it not?

A If you flow your wells at a higher rate, you are less likely to have frequent water accumulation than if you flood at a higher rate. The water well releases itself of the water and we catch it in our facilities.then.

Q So if you have a lower line pressure which permits the well to produce at a higher rate, the water problem would be less frequent, wouldn't it?

A No. At a lower line pressure a well doesn't necessarily plug at a higher rate.

Q You say it doesn't?

A At a lower line pressure the well loses its ability generally, if it isn't producing at a higher rate, to lift this water out, and thereby it has to be physically removed.

Q Is it your testimony that the Caulkins Oil Company is not producing at a higher rate than Continental?

A I couldn't say on an individual well basis.

Q Is it your testimony that Continental is not producing at a higher rate under the present line pressures than it was producing under the prior line pressure of three to four months ago? This will be testified to.

A I don't have the figures here before me, sir.

Q You don't know, but you wouldn't dispute that, would you?

A No, I wouldn't.

Q But you do persist that lowering the line pressure doesn't

necessarily increase the production, the flow rate?

A It will for a short period, but over a sustained period, it wouldn't.

Q Now, you testified in regard to this testing equipment you were invited to witness these tests?

A Yes.

Q Did you do so only on one occasion?

A On the Continental MJ-1 I happened to catch Continental's tester there, I think on two occasions. I stopped and talked to him there.

Q That is the only one you saw?

A I was by the Continental L1, I think it is one of the ones in the seven wells, and Continental M1 is the only one that I was by at the particular time.the compressor was installed.

Q You never saw the test results until this hearing?

A No.

Q Did you ask for them?

A No.

Q You said that the well that M-1 that was discharged into what, what was the casing?

A The Continental Axi Apache J1 and J2 definitely had these lines, two lines, a suction and discharge line going to the well, and I am certain the Continental M-1 did.

Q That resulted in unloading the water factor, didn't it?

A Yes, sir, it probably did that.

Q So, that would substantiate the conclusion that a higher flow rate will reduce your water?

A It would where you are circulating a discharge back into the casing and up through the tuck, you would have a higher flow rate through the tubing, not necessarily through the measurement facilities.

Q Do you know whether that gas that was being circulated was ever measured?

A It was not measured.

Q It didn't contribute to any of the problems in any sense of the word, other than the effect on the water?

A Right. It could have more or less stabilized the suction pressure.

MR. KELLAHIN: Thank you, Mr. Dean.

MR. PORTER: Anyone else have a question of the witness?

MR. JAMESON: Our next witness will be Mr. Joe Boyd. Let the record show that this witness was sworn previously.

JOE BOYD

a witness, having been first duly sworn according to law, upon his oath, testified as follows:

DIRECT EXAMINATION

BY MR. JAMESON

Q State your name, please.

A My name is H. J. Boyd.

Q By whom are you employed?

A I am employed in the Gas Supply Department of Southern Union Gas Company as a reservoir engineer.

Q Would you give us a resumé of your education and experience in that field of endeavor?

A Yes, I graduated with a professional degree of petroleum engineer from the Colorado School of Mines in 1963.

Upon graduation I accepted employment with what is now the Atlantic-Richfield Company in California, where my primary duties were as analytical engineer, basically reservoir engineering.

In September, 1966 I returned to the Colorado School of Mines for graduate study where I received a Master of Science degree in petroleum engineering.

On the completion of my Master of Science degree in 1967 I accepted a teaching and research position on the faculty in the Department of Petroleum Engineering, Mississippi State University.

Consequently, my responsibilities during that term of employment were divided between teaching and research, and in July of 1969, after two years on the faculty at the University, I engaged myself as a consultant petroleum engineer with the State of Mississippi, where a majority of work consisted of reservoir evaluation.

In May of 1971 I accepted employment as a reservoir

engineer in the Gas Supply Department of Southern Union Gas Company.

I am a registered professional engineer in the State of Mississippi.

Q Since your employment with Southern Union have you had occasion to make a study of the South Blanco-Pictured Cliffs Pool in the San Juan Basin?

A I have had occasion to make a study of certain aspects of this pool, yes.

Q Mr. Boyd, I direct your attention to an exhibit identified for the record as Southern Union Gas Company Exhibit No. 18, and ask you that you explain that exhibit.

A Yes, Exhibit 18 is a tabulation of wells that were cleaned by Southern Union Gas Company personnel.

In addition, we have a tabulation of the location of those wells, the date on which they were cleaned; the 24-hour rate immediately prior to cleaning, and the 24-hour rate immediately after cleaning.

Q Now, I see that you have one with a line drawn through it. What is the significance of that?

A Yes, that well, Axi Apache J14, is not a Pictured Cliffs producer, even though it was cleaned.

Q It is not properly in the South Blanco-Pictured Cliffs Pool?

A That is correct.

Q All right. What conclusion did you draw between the

figures and the data shown in the column 24-hour rate before cleaning and the 24-hour rate after cleaning?

A Well, the only conclusion that I can draw here is that water in the tuck is a restriction and limits the flow of gas through.

I might also point out in regard to the 24-hour rate before and the 24-hour rate after, by this exhibit, I am not saying or do not intend to infer that is in any measure a sustained rate. That is the 24-hour rate prior to and the 24-hour rate after this physical operation took place.

Q Were these figures calculated from the meter charts of Southern Union?

A Yes, they were.

Q Would it be fair to say from this data that the flow rates from the Continental wells would be substantially less if they were not diligent in keeping their wells cleaned, than it would be if they were diligent in keeping their wells clean?

A I would have to zero in on some semantic definition of "substantial."

Let me leave it this way: Any time you put a restriction in the flow path of a fluid, you are going to limit the flow.

However, to how great an extent this flow will be limited will depend on a number of factors.

Q Mr. Boyd, I refer you to an exhibit consisting of three pages identified for the record as Southern Union Gas Company Exhibit No. 19, and ask you that you explain those three graphs that are included in that exhibit?

A Yes, Exhibit 19 is a plot of the instantaneous producing rate versus time during the period that the respective Continental Axi Apache wells were on this special compressor test.

Q Is each of these graphs related to a different time?

A Yes, they are.

Q The three wells that are covered by these three graphs, are they three of the six wells that have been previously testified to as being subject to compressor tests?

A Yes, they are.

Q All right. Now, from these graphs, what conclusion can you draw with reference to the data shown on the exhibit?

A Allow me to explain that question in three parts, in that we have three graphs.

The first graph, Axi Apache M-1, the conclusions on this test, I feel, are, in my opinion, limited.

The only conclusion we can draw here is that the production rate at the end of the test was less than at the beginning of the test.

Now, on the following graph, which shows the same information on the Axi Apache L3, here again we are limited

as to the conclusions that we can draw because of the nature of the test. Now, and again, I will say that the only conclusion that I can draw from here is that the production rate at the end of the test was less than the production rate at the beginning of the test.

Now, I would like to point out one thing, and if the Commission will please note that there is a period consisting of some 28 hours here, that I have labeled as a no flow period, that is not entirely correct. There was an initial six hour flow.

The well logged off for some reason for the following 22 hours, and then the first point that I have on this graph is actually the 28th hour of the test.

On the following graph, this is of the Axi Apache 0-1, I believe this test is perhaps more definitive than those previous tests in that we, during the some seven days approximately seven days that the test was run, we did not have the interruption in the flow, and we can see from the observation of the graph that the production rate is declining, and at the end of the test is still declining.

Now, there is a comment that I wish to make relative to this test, also.

Our meter charts indicate that this well was logged off of production.

Q When you say "this well," which?

A I beg your pardon. I am referring to Axi Apache 0-1, which is represented here on the third graph.

This well was logged off of production for two full days prior to the start of the test.

The specific dates are October 29th and 30th.

The test period is November 1 through November 9, 1971.

Q All right. Now, let me ask you this. Do these graphs indicate that striking an average rate of flow for the seven day period, as did Continental, gets you to a higher Mcf per day production rate than that indicated at the end of the seven day test period?

A Well, obviously the average flow rate over the seven or eight day period would not be as high as that at the end of the period.

Q And which data--that is, the average rate versus the end of the period rate--is more reflective of what the well would do in the future?

A Well, at the end of the flow rate at the end of the test period would be more reflective of what the well can do in the future than some average, in this case.

Q Did I understand you to say that the average Mcf per day flow rate was lower than the end of the period or--

A If I said that, I was in error, or I meant that the average flow rate for this time period will be higher than the end flow rate, yes.

Q And the lower end of the period flow rate would be more representative for predicting future performance of the well?

A That is true.

Q Mr. Boyd, I call your attention to the series of 31 graphs that are identified for the record as Southern Union Gas Company Exhibit No. 20, and ask you to explain the data that has been plotted on those graphs.

A Exhibit 20 is a plot of the production rate and the meter pressure versus time for the years 1969, '70, and '71 on the wells, the Conoco wells that are connected to the Southern Union Gas Company Gathering System producing from the South Blanco-Pictured Cliffs Formation.

Q Does this exhibit contain a separate graph for each of the 31 Continental wells?

A I believe that it does.

Q Proceed with the explanation of this exhibit.

A Well, sir, I would call attention basically to the procedures used during the year 1971.

I don't think we need to go further back than that, really.

Let me be general here, if I may, generally what is reflected on these graphs is that during the month of October and partially into November most of these wells peaked out in production.

Since that time we have realized a decrease in the producing rate, even though we have continued to have, in most cases, a decrease in operating line pressure.

Q From the data available to you and represented by these graphs, what prediction could you make with reference to the production on an Mcf per day basis of the Continental wells for the future?

A Mr. Jameson, I would not make a prediction as to how much each of these wells will produce.

Q I really had reference to the trend.

A Yes, I can comment on the trend and say that in my opinion I do not believe these wells are beginning to reach a stabilized flow period.

What flow rates will be thirty days from now, two months from now, I don't know, but it is my considered opinion that the flow rates in January and February will not be as high as those in December. The December flow rates were not as high as those, for example, in November.

May I point out for the record, I said that in general this trend existed. If we wish to get into it in cross-examination, I can list those exceptions. I have them indicated here.

Q I refer you to a map identified for the record as Southern Union Gas Company Exhibit No. 21, and ask that you explain that map.

A Yes, Exhibit 21 is an Isopac map on the net pay sand in the South Blanco-Pictured Cliffs Pool.

This map was developed on the basis of SP development of IES logs.

You will observe that I have a color scheme here, that I wish to explain.

The brown color represents what I consider to be no sand development.

The yellow represents sand thicknesses in excess of zero but less than ten feet of net pay.

The green represents greater than ten feet, but less than twenty feet of net pay.

The red represents greater than twenty feet, but less than thirty feet of net pay.

The blue represents greater than thirty, but less than forty feet of net pay.

The purple represents that sand development which is greater than forty feet, and let me call your attention to what is purple, as it didn't show through very good on all of the maps.

I am referring to that section of the formation or that portion of the formation which is contained in Sections, roughly, 18 and 19 of Township 26 North, Range 5 West, and that extends over into Section 13 of Township 26 North, Range 6 West.

Q Now, have you shown the Continental leases on this map?

A Yes, the Continental leases in the South Blanco-Pictured Cliffs are outlined with a purple border.

Q I notice another forty foot contour up in the north part of the Township 26 North, Range 26 West.

Did you fail to mention that?

A I failed to mention that. There is a small area that I considered to be in excess of forty feet of net pay.

That is partially in Section 5; partially in Section 8 of 26 North, 6 West.

Q Now, what conclusion can you draw from this map with regard to the relative thickness of the pay under the Continental leases as compared to the relative pay thickness on the balance of the producing area shown on the map?

A I constructed this map. Isopac maps are simply one means of several available to differentiate the equality of a well.

Here I have simply differentiated on the basis of net pay thickness, or what I could possibly defend as net pay thickness.

The map indicates that the Continental leases are generally out on the extremities of the pool, and in the thinner portions of the Pictured Cliffs Formation.

Q Approximately how many well logs did you analyze in this South Blanco-Pictured Cliffs Pool for the purpose of

comparing this exhibit?

A Mr. Jameson, I can't answer that question. I would say a fair estimate would be 300.

I would suspect that was a conservative estimate. I have looked at many, many logs.

Q What conclusion would you as a petroleum engineer draw as to the effect of the relative pay thickness on the ability of a well to produce and deliver gas?

A Well, all other perameters in the flow equation being equal, with the exception of pay thickness, the thicker the section, the more production that you have, the higher their production rate.

Q Now, I notice on the map that you have some lines drawn marked A to A Prime B to B Prime and C to C Prime and D to D Prime. What do those lines represent?

A Those refer to my next exhibit, and are those lines, are the paths of cross sections that I made as a means to further differentiate sand quality.

Q Now, does this map show that there is a thick trend in the heart of the pool going from one end of it to the other that completely misses all of the Continental leases?

A If I have interpreted, my logs, properly, yes.

The thick trend does basically go down the middle of the Pool. As evidenced by the color scheme, Continental enjoys very little of this additional pay thickness.

Q You now said if you had correctly interpreted your logs. Do you have any reason to believe that you did not correctly interpret them?

A No, sir. I have, part of my responsibility as a reservoir engineer is well logging. When I was at the University I taught well logging and this sort of thing.

I believe that I am a competent, at least partially competent interpreter of logs.

I am generalizing here, because there are some relative difficulties in using logs in the South Blanco-Pictured Cliffs.

Q Mr. Boyd, directing your attention to the drawing identified for the record as Southern Union Gas Company Exhibit No. 22, I will ask that you explain that exhibit.

A Well, Exhibit 22 is a cross section on the South Blanco-Pictured Cliffs as outlined on the previous Exhibit 21, a cross section is simply a utilization of logs properly spaced out, and, as a further means of differentiating between the quality of sand.

And let me emphasize further, differentiation between the quality of sand.

If we have--let me put it this way--the Isopac map does not necessarily reflect the quality of the sand. All the Isopac map says, "Well, we think we have got 15 feet here or 30 feet here that will be productive for years."

An electrolog or a comparison of electrologs, or a comparison of logs on various wells will allow you, at least, to get a qualitative appreciation for sand development in these particular wells that are represented by the logs.

Q Now, what are the results of your study of the South Blanco-Pictured Cliffs wells with reference to the relative quality of the sand in the Continental wells to wells offsetting the Continental leases?

A I think it would have to be agreed that the quality of sand is not as good on the Continental wells as it is in some offset areas.

Q When you say quality, now what are the factors that make up that difference in qualities?

A You can get a qualitative comparison simply on the basis of SP development. You can't draw any quantative conclusion from this. I am not presenting this as a quantitative conclusion, but merely on the basis of SP development you can get a qualitative comparison of the wells.

I point that out by using, as an example, in the C-C Prime cross section, the Amoco Company Jicarilla 55-6, located in Section 31, Township 26 North, Range 5 West, has a fairly good, or is, relatively speaking, it has good SP development.

It is not--there possibly is three or two rather thin shale stringers on that well.

If we go over to the Amoco Jicarilla 147-3 and the Conoco Jicarilla J-4, both of which are on the Continental acreage, I point out that the Amoco Jicarilla 147-3 does not produce from the Pictured Cliffs. It simply penetrates the Pictured Cliffs on

You will see we do not have significant SP development there.

We have several shale strings throughout what would be classified as the pay zone.

So, simply on a comparison of logs here, I would conclude that the Continental wells probably would not be able to produce as much from the Pictured Cliffs as say the Amoco Jicarilla 155-6 if that well were producing from a Pictured Cliffs.

Q Now, is there any indication on these logs that you have shown on your cross section of layers of shale and clay in the zone that you have shown?

A I am sorry. Would you repeat that question?

Q Is there any indication that there may be shale and clay in the areas that you have shown on this cross section to be covered by the logs examined?

A If I understand the question correctly, yes, there are indications that shale and clay are, that we have what is generally called a dirty sand in here, and I point to the example of Conoco Jicarilla J-6. The SP development here

in this well is very unstable.

This is believed to be a result of the dirtiness, for example, of the sand in that well.

Q Have you drawn any--you speak now of the dirtiness of the sand. Have you drawn any conclusion with respect to the relative dirtiness of the sand between the Continental wells and other wells in the same pool?

A Well, I will refer back to this cross section C C-Prime. I don't think that it could possibly be argued that the Continental Jicarilla J-6 is "dirtier than the Amerada Jicarilla L-4 even the Amerada Jicarilla F-2."

Q All right, now--

A In short, what is inferred here is that there is more shale and clay in the Continental Jicarilla J-6 than those two other wells that I previously mentioned, that I have just now mentioned.

Q How does that effect porosity in the different areas of the Pool?

A In the inclusion of any material other than sand or inclusion of shale and clay into the pores of the sand, it will decrease the available porosity for whatever fluid may be present.

Q Now, based on the work you have just testified to, can you draw any conclusion with respect to the relative permeability of the Continental wells to other wells in the Pool?

A Well, here again, I must emphasize that this is true in a qualitative way. It is generally accepted and generally an accepted fact that shale and inclusion of shale in clays reduces the permeability of the productive formation.

Q Based upon the data, all of the data that you have just testified to, what is your opinion with reference to the ability of the Continental wells to produce and deliver gas as against the relative ability of other wells in the Pool to produce and deliver gas?

A Well, I can't totally select 31 Continental wells and say that they are going to produce less than any other wells in the field, because obviously there are a few wells that qualitatively you would have to rate.

I think an example of that is the Kelly Oil Company Roberts No. 3, which is on cross section A A Prime.

Now, if we get away from these exceptions and we look at the South Blanco-Pictured Cliffs Formation as a total entity, I would assume I would conclude that the Continental wells do not have the ability to produce, all other things being equal, at a production rate as high as the other wells.

Q Now, Continental has drawn a lot of comparisons between the Caulkins wells and the Continental wells. Would that conclusion be applicable to those two classes of wells?

A I think it would be, yes. My study of logs indicated better sand development and thicker sand development in the

Caulkins area as opposed to the Continental leases.

Q Mr. Boyd, I will ask you whether or not the presence of the water in a dirty sand compounds the production problems in excess, far in excess of the presence of the water in a much cleaner sand?

A Mr. Jameson, I can't answer that question as it is asked because there are many, many things involved.

Certainly the presence of a mobile liquid phase is going to reduce flow of a dry fluid phase.

Q I really had reference, and perhaps you misunderstood me, to the relative permeability and expansion and effect of expansion of clays due to water in the formation in a dirty sand as opposed to a clean sand?

A I am sorry. I am not reading the question properly.

Q We know from production history of these wells that there is a water problem in producing these wells.

A O.K.

Q Now, I am asking whether or not the effect of that water problem in the Continental wells with a dirtier sand and with clay that can expand with water contact, isn't compounded in its effect on production rather than the existence of that water in a much cleaner sand?

A Oh, I think generally this would be true. It reduces the cross section shale area that the gas has to flow through.

MR. JAMESON: Let's end it at that.

We will tender the witness for cross-examination.

MR. PORTER: Would you like to submit your exhibits?

MR. JAMESON: Right, that is right.

Q (By Mr. Jameson) Mr. Boyd, I will ask you whether Southern Union Gas Company Exhibit 18, 19, 20, 21, and 22 were prepared by you or under your supervision?

A Yes.

MR. JAMESON: We tender those exhibits into evidence at this time.

MR. PORTER: Any objection?

The exhibits will be made a part of the record and I believe there may be a few questions of this witness, so why don't we come up about 1:15?

The hearings will be recessed until 1:15.

(1:15 P.M.)

MR. PORTER: The hearing will come to order, please.

The witness is available for cross-examination, and Mr. Kellahin, do you have a question?

MR. KELLAHIN: Yes, I do, several, I am afraid, sir.

CROSS-EXAMINATION

BY MR. KELLAHIN

Q In giving your qualifications you said you had a professional degree. I don't recall what you said it was.

A I have a professional degree of petroleum engineer.

Q Than you have a master's?

A Master of Science in Petroleum Engineering.

Q What is your bachelor's degree?

A I don't have a bachelor of science degree. My first degree was the professional degree.

Q Then you went on and got the--

A Yes.

Q You had considerable experience in reservoir engineering work, have you not?

A Oh, that has comprised the largest portion of my responsibilities.

Q In doing reservoir engineering work you have had occasion to examine logs frequently?

A Yes.

Q That is what you did in this Pool?

A I did examine several logs in this Pool, yes.

Q I think you testified something like 300?

A That is a very arbitrary number. Let me say I examined many of them.

Q I don't mean to pin you down to the exact number, but you have examined a large number of logs?

A Yes.

Q Did you have the logs on all of the Continental wells?

A No, sir, I did not have all of the logs on the Continental wells, and to a precise number, I don't recall how many I did have.

Q Well, did you have enough you felt satisfied that they were representative of the area owned by Continental Oil Company?
A I think so, yes.
Q Yes?
A I did.
Q Now, in connection with your work, you made considerable analyses of pressure production data, have you not?
A In regard to the South Blanco-Pictured Cliffs?
Q No. I mean in your experience generally you have done this type of work?
A Yes.
Q Did you do it in this case?
A To the extent that is shown on the exhibit here.
Q To the extent that is shown here?
A In the Exhibit 20.
Q Exhibit 20?
A Yes.
Q That is the only exhibit you are referring to in connection with your pressure rates? You didn't do anything on pressure rates, actually, did you, like a pressure production decline curve?
A No, the only thing I did on the pressure rate is presented in Exhibit 20.
Q In connection with your analysis of these logs, you say you utilized the logs and the SP curve to establish net pay?

A Yes.

Q How do you read net pay from a SP curve?

A Well, the basis that I used was basically to utilize that sand development between the inflection point on the SP curve.

Q What did you consider net pay?

A Well, in some of the areas that obviously had a lot of shaleliness, ten, ten to fifteen millivolt development.

Q Ten to fifteen millivolt development?

A Yes.

Q Did you attach a porosity figure to that net pay?

A No, sir, I did not.

Q Did you consider permeability in connection with your net pay figure?

A No.

Q Did you examine any logs in arriving at your conclusion in regard to the accuracy of your examination; did you examine any core data?

A Yes, I examined some core data, and that is basically why I didn't--I examined the well core data and tried to make some sense out of that relative to the logs. In this respect, in that I tried to see if I could maybe calibrate it, get some relationship, but that proved to be not worthwhile.

Q You are saying then the logs are worthless for examining

this reservoir?

A No, I am not saying that.

Q What are you saying?

A I am saying that I will readily admit that the logs are more limited in evaluation here than they would be in a very clean hetrogeneous sand.

Q But the logs would also reflect the cores, it would reflect the character of sand, would they not?

A Yes.

Q It would be a valuable tool in determining how much productive pay was in the zone, would it not?

A Well, it would be a valuable tool if you had the complete core of the well, yes, and you had the necessary logs to correlate this to.

Q Well, you said you had logs. Did you have the logs on any Continental wells?

A Yes, I did.

Q How many?

A I have already told you. I don't recall a specific number. I had several logs on the Continental wells.

Q Did you have as many as five?

A Oh, I had perhaps twenty, perhaps even more than twenty. I am talking about the Continental. That is what I am talking about.

Q You had about twenty?

A I had several logs.

Q How many cores did you have on the Continental wells?

A I did not have any cores on the Continental wells.

Q None at all?

A No.

Q Does your company have those cores available?

A If they do, I was unable to find them.

Q Now, in your analysis of net pay what factor do you take into consideration; how do you arrive at that figure?

A Well, as I explained in direct testimony, I developed the net pay on the basis of SP development, and I have explained to you what my basic criteria was.

Q That is that you considered, as far as the development, the Isopac maps?

A That is true, which is Exhibit 21.

Q You didn't give any consideration to the permeability or porosity of the Formation in arriving at this conclusion?

A Sir, the permeability and porosity, the basic information, basic information on the formation is very sparce out here.

Q Well, did you or did you not consider it?

A Let's have that question again.

Q Did you consider permeability and porosity in arriving at your net pay Isopac map?

A In a quantitative method, no.

Q Now, referring to your Exhibit No. 18, that applies only to

Continental wells, doesn't it?

A Yes, it does.

Q Did you make the same comparison for any other wells in the Pool?

A I had no other information indicating to me that other wells in the Pool had been cleaned by our personnel.

Q You state that this did not reflect a sustained rate of production?

A I did.

Q Then why do you offer the exhibit?

A Simply to show that a restriction is in the tuck, and at least, as long as my conclusion was this, that liquid in the tuck string will lower the flow rate through that tuck string.

Q It will also show if it is not a sustained rate that they would revert back to their prior status; is that what you said?

A I don't think I said that at all.

Q Would you say that--you cleaned out the wells, they started producing. Let's take the Axi Apache J-1, produced 340 Mcf per day?

A Yes.

Q That is a top allowable well, is it not, or do you know?

A Sir, you are asking me something I am not qualified to

testify on. I have not in any regard made comment to allowables, the Commission status of the wells, the deliverability. I have testified purely as to production rate, and Exhibit 18, I think, is fairly self explanatory, and the conclusion is straightforward, as I made in direct testimony, in that liquids were removed from the well, and the production rate after that liquid removal was higher than the production rate prior to its removal. That is the sum total of my conclusions for this exhibit.

Q Now, these rates were all taken at the same line pressures, I assume?

A I do not know what line pressures these were taken at, specifically.

They are all attached, connected into the Jicarilla Gathering System.

I think that prior testimony has indicated that line pressures along that line are comparable.

Q Now, you have a 24-hour rate before cleaning. When was that rate established, for what period of time?

A In most cases, it was the immediate 24 hours preceding the cleaning.

Q But not in every case?

A Well, the ending period before cleaning ends at the time the well was cleaned, and in all cases did not go back a complete 24 hours.

Q Did you calculate the rate then?
A Beg pardon?
Q Did you calculate the rate for a 24 hour period?
A Yes, it only went back 20 hours, for example, the rate of the total production during that 20 hours was determined, and then this was made relative to a 24 hour rate.
Q And the same is true then on your 24 hours after cleaning. Was that produced for 24 hours? Is that an accurate figure?
A The beginning of the 24 hour rate after D starts immediately after the well was back on the meter, yes.
Q You ran it for 24 hours, so you didn't have to make any calculations on the allowables?
A I think in most cases that I did. I don't know that. I don't recall exactly how long those flow rates existed after cleaning.
Q Now, referring to Exhibit No. 19, this only reflects the information on these wells on the test that was performed by Continental Oil Company; is that correct?
A This Exhibit 19 is a plot of the production rate versus time during the compressor test, the special compressor test.
Q Is this source of information from the charts?
A Yes.
Q Were those furnished back to Continental Oil Company?
A Continental, it is my understanding, that Continental got a copy, a Xerox'd copy of these charts.

Q Now-

A I cannot vouch for that. I did not send them a copy.

I am told that they were sent a copy.

Q Do you make this type of computation every time a deliverability test is made?

A Let's stay away from deliverability.

Q I am asking you about a deliverability test. This was a well test. Do you make any computations on any other tests as to performance?

A My concern was instantaneous production rate at any particular time, producing rate, not to be confused with whatever deliverability might mean.

MR. PORTER: I have often wondered what it meant, myself.

Q (By Mr. Kellahin) You say that this shows that the production was declining, and yet on the Axi Apache M-1 it reached a bottom point and then started climbing again, did it not?

A Yes, sir, that is true. There are two points that have post slope.

Q And the same is true on the Axi Apache L-3?

A That is true. There at the end, nearing the end of the test the slope does increase.

Q That doesn't indicate the production was declining, does it?

A Well, if you take this from the 92d hour to the 94th hour, during that particular time period, certainly there are

going to be variations, but I am looking at the total test time from time zero to near the end of the test period.

Q The only well that showed a decline, actually, was the 0-1?

A No, sir, that is not true.

Q The only one on the exhibit, then?

A No, sir, if you will examine Exhibit 19, the first graph, you will see that the initial production rate was about 56 Mcf's per day.

If you will examine the input of that graph, that is 44 a day, that is a decline.

Now, if you will go to the second graph on Exhibit 19, you will see that the initial production rate that I have plotted here was 345; the final production rate was about 135, I believe.

That is a decline to me.

Q Now, Mr. Boyd, when you put a well on test after it has been shut-in, isn't it normal that the production rate will be high initially and it will decline until the well stabilizes?

A When you shut a well in, and then put it on the test, yes, you would expect some of what has been described here before as flushed production, whatever that is.

Q Well, in your opinion, have these wells stabilized at a rate shown on these exhibits?

A No, sir, I don't think that they have come to the point to

where--now, when we talk about stabilizing, let me apply my own definition to that. When a well is stabilized it should be able to produce at about the same rate over at least a 24-hour period, and none of these graphs indicate that this well is producing at a stabilized rate over a 24-hour period.

Q Actually, it is showing an increase on two of them, isn't it?

A Well, if you look at it from about the 72nd hour of the test to about the 96th hour of the test, and then about the 120th, and about the 144th hour of the test, yes, there was a small increase there, but I fail to see how we can pick the graph apart and look at only those two segments, particularly in view of the fact that the chart indicated an interruption along the flow period.

Q How many well delivery tests have you ever witnessed? Have you witnessed any?

A No, sir, I did not.

Q How many have you examined the data from them?

A Are you talking--if you are referring to the State Oil Conservation Commission Deliverability Test, I think I should decline to comment on that because I have specifically talked about production rates as opposed to whatever the statutory deliverability is.

Q Isn't a production rate a factor in the state deliverability test?

A Sir?

Q Do you know?

A You are getting on ground that I know a little about the statutory requirements, but I am not nearly as familiar with them as some people are, and I purposely stayed away from this.

Q Well, Mr. Boyd, you may have purposely stayed away, but did you not hear Mr. Mattes testify yesterday these tests, you attempt to analyze here were conducted on the same basis as the deliverability test required by the Commission?

A Yes, I heard him testify to that. I am not disputing that. All I am simply saying is that I have plotted the instantaneous production rate versus time during that test, and in my opinion, sir, we do not have a stabilized flow rate. That is all I am saying.

Q Well, how did you happen to pick those three particular tests?

A I think that you are getting to why I did not include all six of them.

Q Yes, sir.

A Let me state, sir, that I looked at not only six, but I believe eight compressor tests, or eight wells that the compressor was on.

There were several reasons why I didn't do it. I think the best reason is explained on Exhibit 20.

The Axi J-1 was one of the wells that was on a compressor test.

You will see that in October, if you examine that graph, in October the production rate peaked out, it declined in November, and it declined some time further in December, and my having three more graphs just adds more volume to the already voluminous exhibits.

Q In connection with your Exhibit 20, Mr. Boyd, I don't want you to discuss those where we didn't show a decline. I think it is obvious that they are still producing at higher rates from your graph itself, but in general, for example, let's take the Apache J-3 lease.

A Sir, shall we take all of the exceptions?

Q No, sir. We will take the Apache J-3 lease. If your counsel wants to question you about any others, he may do so.

A The third graph. The well--

Q Yes, sir, the third graph in your Exhibit 20.

A O.K.

Q Now, that shows a slight decline from November to December, does it not?

A Yes, it does.

Q But it shows substantially more production during those two months than for any other month on your graph '69-'70, and '71?

A Yes, that is true.

Q Is that also true, for example, on the Apache J-7 lease, not so striking a difference, but production still is climbing and it is producing more than it produced at any other time?

A Yes, it is still--the December rate was higher than at any other time in 1969, '70 or '71.

Q Now, here is another one that declined, the Apache J-12 lease. That produced during November substantially more than it produced any other time during the period shown on your graph, and it was producing at the end of December more than it produced any time during 1970 or 1971; isn't that correct?

A Yes, it did produce more in December than it did through '70-'71.

Q So the result is reducing your line pressures has increased the production for at least some of Continental's wells, has it?

A I don't think that has been denied, sir.

Q Now, on Exhibit 21--we have discussed that somewhat already --but I will have a couple more questions.

Did you consider the method of allocation as reflecting your net pay as being indicative of what an operator is entitled to?

A Sir, you are getting back into an area that I have already

stated that I am not qualified to testify about.

I am not familiar with the allocation procedures that are applied to here.

I mean, in Exhibit 21, I have simply tried to in one fashion differentiate as to the relative quality of the sand, and in Exhibit 21 that aspect of quality has to do with sand development, pay thickness.

Q Are you offering this exhibit with the view to show what each operator is entitled to produce?

A No.

Q You don't say that has anything to do with it?

A Certainly sand thickness has something to do with what a well is capable of producing.

Q I am not talking about what it is capable of producing. I am talking about what it should be permitted to produce.

A That is totally outside the area of my responsibility, and I cannot testify to that.

Q Now, have you calculated the gas reserves underlying each tract here?

A No, sir, I have not. I did make a sand volume calculation, which I have not included as an exhibit.

Q That is an allocation you could make, is it not?

A The reserves?

Q Yes. I mean, you have the ability to make it and the information necessary to do so?

A I have the ability to make it. Results anyone can argue with results. All the quality of data input is a very simple process to calculate gas.

Q What you are saying is engineers don't agree any better than lawyers?

A That is basically it, yes, yes, sir.

Q Could you also calculate on the basis of the information available to you drainage from one tract to another?

A No, sir.

Q You cannot do that?

A No, sir.

Q You do not have the ability or you do not have the information?

A I have the ability. Here again, we go back to the engineer-lawyer. I don't think that we would be in agreement.

Q That is what you are saying?

A Right. We say that we may not necessarily be in agreement.

Q On your cross section you refer to an Amoco well which you said had better sand development, therefore it will produce more gas?

A I think, sir, that I was referring to the Amoco Jicarilla 155-6. Is that the one you are referring to?

Q Yes, I believe that is correct. I didn't get the number.

Now, you say that well will produce more gas, I believe was your testimony; isn't that correct?

A If all other perameters are the same.
Q If only the sand thickness--
A The sand thickness is different?
Q Yes.
A Everything else the same except the sand thickness?
Q Yes.
A The well in the thicker sand will produce more gas, more fluid.
Q Do you know what pipelines that well is connected to?
A No, sir, I don't. As a matter of fact, I don't believe that this well is a Pictured Cliffs producer.
Q So you are comparing the sand thickness in some other formation to the Pictured Cliffs?
A No.
Q What are you comparing it to then?
A This is the Pictured Cliffs Formation. The casing--if I am not mistaken--the casing simply wasn't perforated in the Pictured Cliffs.
Q So, Amoco is not producing that as a Pictured Cliffs well?
A I don't think so. I don't know, really don't know.
Q You have some other wells on there, Amerada's, are they connected to the Southern Union in the Pictured Cliffs Formation?
A The Amerada wells are not, they are not.
Q Are they producing from the Pictured Cliffs?

A Yes, sir, I believe they are.

Q Do you know what line pressure they are producing against?

A I don't know what those line pressures are right now, no, sir.

Q Now, have you made any comparison of the deliverability of the various wells you have analyzed here to determine the quality?

A Sir, you get back to deliverability.

Q You haven't done it?

A I explained to you that what I am interested in as a reservoir engineer is production rate, not deliverability.

Q Well, Mr. Boyd, you keep evading the question. Doesn't the deliverability test show then the delivery rate; is that not one of the figures shown on the test?

A Do you want me to plead complete ignorance to that?

Q If you wish.

A All right. I will have to tell you that I don't know.

Q You don't know what the deliverability test does?

A I don't know what all is involved in the deliverability test.

Q Then you don't know anything about the application of the Commission proration formula; is this your testimony?

A That is true. Well, I know very little about it.

Q You don't know enough about it to testify whether it is effective or not to give ratable take to wells in the pool?

A No.

MR. JAMESON: Mr. Porter, I think we have gone far enough on this line of questioning. The witness has qualified himself as a reservoir engineer, not as a proration expert. I believe it is time for this line of questioning to come to an end.

MR. PORTER: I think it has.

MR. KELLAHIN: That completes our cross-examination.

MR. PORTER: Anyone else have a question of Mr. Boyd? The witness may be excused.

MR. JAMESON: That completes our rebuttal case.

MR. PORTER: Do you have another witness?

MR. KELLAHIN: I would like to recall Mr. Mattes for some very brief questioning.

MR. PORTER: I see. Let the record show that Mr. Mattes is still under oath.

This is the same Mr. Mattes who testified before.

MR. KELLAHIN: I believe that will be our Exhibit 23.

RE-RE-DIRECT EXAMINATION

BY MR. KELLAHIN

Q At the hearing yesterday a series of exhibits were presented by Southern Union Gas Company, apparently purporting to show that the production from Continental wells could not be continued at a sustained rate and that they were in fact declining, and I refer particularly to their Exhibits 4, 6,

and 8.

Did you review those exhibits?

A Yes, I did.

Q And on the basis of your review, what analyses have you made?

A Well, I have made an analysis of the data that is contained in Southern Union Gas Company's Exhibits 4, 6, and 8.

Q Before you start, would you please identify those three exhibits?

A Exhibit 4 is the average producing pressure; Exhibit 6 is the production; Exhibit 8 is the producing days.

Q Did you make a composite exhibit showing the results of comparing those three exhibits?

A Yes, sir, I did. I added up all of the numbers on all three of these exhibits by operator, and then divided that total by the number of days at a point which had been included for that operator to arrive at an average for that operator for the producing pressure for the production and for the producing days, for the period, the seven-day period ending January 1 and the eight day period ending January 9.

Q Referring to Continental's Exhibit No. 23, would you discuss the information that is shown on that exhibit?

A Yes, if you will look at Exhibit 23, it shows a heading analysis of Southern Union exhibits.

The first one, the operators are tabulated under.

In the second column, the production from Exhibit 6 has been totaled for the seven-day period ending January 1.

The next column shows the producing days or well days, if you will, I believe the term was used, for the same period ending January 1.

The next column, which is the third column, headed January 1 Mcf per well day, merely, that is simple arithmetic that results in, that is the answer that results dividing the total production by the average number of well days, and if you will look at the column for Aztec, that number is 68. That says that from the information that Southern Union has provided us in the three exhibits, as far as Aztec Oil & Gas Company goes, the average well that was on production during the seven day period ending January 1, 1972, produced 68 Mcf's of gas, and then what I did is I took the same period data on Exhibit 4 for the fourth column and totaled up all of the pressures that are tabulated for all of the wells, and divided by the number of data points, which gave me an average producing pressure for all of the wells.

The next column is the same data as in the first data column, except that it reflects the production for the eight day period ending January 9, and I guess that is the sixth column, and it has got the same number in it as the second

column, and the seventh column has got the same number in it as the third column, and the eighth column has got the same number in it, or the same equivalent number in it as the fourth column.

I made these calculations in the room partly and--

Q Let's go right across these columns to clarify this a little bit.

Let's take the first one.

What is shown in column 1, key to Exhibit 6, what is that for?

A What is what, sir?

Q What is the four shown in the first column? It says Exhibit 6.

A That is the production for each operator for the period ending January 1st.

Q O.K. Now, take the second column.

A That is the number of well days the operator produced.

Q Then the third column?

A Is the result of dividing the total production by the number of well days to find the average Mcf's per well day.

Q The average Mcf's per well day?

A That is right.

Q Going across to the next column?

A That is the average of all of the pressures that are reported on Exhibit 4 divided by the number of pressures

reported for each operator.

Q Would that then give you an average pressure per well?

A Directional, that is right, yes, sir.

Q This next column, what is that based on?

A That is based on the same information as is on Column 1.

Q But you extended it for the period?

A Ending January 9?

Q Ending January 9.

A Right.

Q Then the next column?

A It is the number of well days for each operator for the period ending January 9.

Q Now, we go to the next column.

A That is the division of the well days of the eight day period ending January 9 into the total production of the eight day period ending January 9 to get an Mcf per well day for that operator for the eight day period ending January 9.

Q The next column, that is the average of the pressures?

A That is right, sir.

Q Now, we have got those all identified all of the way across. Would you show what the differences are between the different operators?

A Yes, I would. What I did was I just made the simple

arithmetic subtraction of the numbers that were included in the January 9 data; from those numbers I subtracted the comparable values for the January 1st period, and I made this subtraction for the pressure and for the average Mcf per well day, and I have tabulated the results of the simple arithmetic calculation in the last two columns over the past--you will notice the asterisks by the heading, if you will look at the bottom of the page, the first column shows the production change on a per well basis, 1972.

Q You said per well?

A Per well day, that is right. The last column, which is a double asterisk, the average producing pressure changed from 11 to 19, 1972, and this comparison brought me to a very interesting quantative conclusion, and it is a matter of just simply comparing the change in pressure with the change in production.

The interesting thing is that all of the pressures on the average for all of the wells in the South Blanco-Pictured Cliffs Pool connected to Southern Union went down.

The amount changed by varying amounts, but you will notice in the last column that all of the producing pressures for the eight day period ending January 9th were less than the producing pressures for the same seven day period ended January 1.

Now, if you will look in the next to the last column,

which shows change in production, the only guy there whose production is increased is Continental, and the increase that I have shown on this exhibit is 3 Mcf per day, and I believe that it is already been the number of comparable numbers, that I remember, is two, but I think my number is three.

Q Now, that doesn't sound like very much gas.

What is the significance of 3 Mcf's per day change during this nine day period?

A Well, if you take the 3 Mcf's per well day and then you multiply that 3 times 31, that producing 93, 93 Mcf's, if you will compare the 93 Mcf's with the 67 Mcf per well day that is the average for the Continental wells, that 3 Mcf per day difference represents nearly the addition of another well and a half to our system, a 3 well and a half, if you will.

Q Now, even at the prices Continental is getting, that is a significant amount of gas, is it?

A That is a significant amount of gas.

Q Now, are all of the figures shown on our Exhibit 23 derived from the exhibit offered by Southern Union Gas Company with the exception of the last two columns, and they are computations based on those figures?

A The data, the first column and the fifth column data were taken directly from Southern Union Exhibit 6. The second

column and the fifth column, sixth column, second column--excuse me--and the sixth column were taken directly from Southern Union's Exhibit No. 8, and the multiplication--excuse me--I mean the division represented by the number in the third column and the eighth column is mine.

And the pressures shown in the fourth column and the eighth column were the pencil averages that I made myself, and they were averages of the data that was provided by Southern Union.

Q Now, I would like to offer Exhibit 23.

MR. PORTER: Any objection?

MR. MORRIS: No objection.

MR. PORTER: Exhibit 23 will be admitted.

Q (By Mr. Kellahin) I have one further question. You heard Mr. Haseltine testify yesterday to the effect that we had made well tests for the purpose of changing our deliverability. Did you hear that testimony?

A Yes, I did.

Q Did we in fact change the deliverability on any of the wells by these tests?

A Yes, we did change them.

Q Would you outline briefly what those changes were?

A Yes, my exhibit of yesterday that summarized our special deliverability test--and I believe it was my Exhibit No. 7--shows that the special deliverability test, deliverability

for J-1 was 184 Mcf per day, while the deliverability test that was run on that well in June, 1970, was 112, and so that deliverability did change, and it went up for the J-2, the 1970 deliverability was 109.

In the special deliverability test, that delivery was 110.

That one changed, too, but it was very small, and it went up only slightly on the L-1, with 1970 deliverability test showing 70 Mcf per day, and our special deliverability test showed 87 Mcf per day. That is a small increase. The L-3, the 1970 deliverability test was 55 Mcf's a day and the special deliverability test that we ran showed 119 Mcf per day, a substantial increase. N-1 had a 76 Mcf per day deliverability test in 1970, and a 32--on our special deliverability test. That is a substantial reduction.

For the O-1 the 1970 deliverability was 51, and our special deliverability test was 56, and that difference of 5 Mcf's is pretty much the same, I guess.

Q Has Continental in any way attempted to use this test as a means of obtaining assignment of allowables to these wells?

A No, sir, we have not.

Q Was that your purpose in running the test?

A The tests were purely to gather data on our wells.

Q What was the significant data you were seeking?

A The significant data we were seeking was the quantity of

gas which the wells would produce, and I might add that in every case the quantity on these tests that I have tabulated on these exhibits, that quantity was substantially higher than that shown in the 1970 deliverability test, and I believe I have already testified to that.

MR. KELLAHIN: That is all I have.

MR. PORTER: Any questions?

MR. MORRIS: Yes, sir.

RE-CROSS-EXAMINATION

BY MR. MORRIS:

Q Mr. Mattes, as I understand your Exhibit 23, you have looked only at Southern Union's Exhibits 46 and 8, which pertain solely to the information on the two recent chart periods from January 1 to January 9.

A That is right.

All of the data that is tabulated on the chart and all of the arithmetic whose results are shown on this chart quantatively was obtained from the data in Southern Union Gas Company Exhibit 4, 6, and 8.

Q Now yesterday vou on your direct case presented an exhibit, which I believe was Exhibit 20, which showed a comparison of monthly production versus time, that went up through November of 1971; is that correct?

A That is correct.

Q It did not have the December figures on it?

A No, sir, I testified that it did not.

Q All right.

Now, let me ask you, in making this analyses, instead of just taking the period from January 1 to January 9, why didn't you go back and take the December figures that were supplied to you yesterday so that you would have a more meaningful period of comparison?

A Mr. Morris, the answer to your question is that data that is contained in Exhibits 4, 6, and 8 and the values that are tabulated thereon have never been before available to me.

Q All right. I believe you testified when I cross-examined yesterday with respect to your Exhibit 20 that you didn't know what the December production figures were, either, that those had not been available to you.

A What I said was that I had the December production figures for six wells of special deliverability tests.

Q All right. Now, in our exhibits that we have introduced yesterday, and I refer specifically here to Exhibit 3, Exhibit 5, and Exhibit 7, we provided to you the December figures on average producing pressure and producing days.

Now, you have chosen to ignore that December information and instead have gone strictly to Exhibits 4, 6 and 8 to make a very short-term comparison of information with respect to Southern Union's exhibit.

My question simply is why didn't you take into account the December production figures so as to give a wider range of comparison?

A Mr. Morris, I guess the answer to your question is that the amount of time I had available was insufficient to totally analyze the chart, the exhibit that related to the twelve month production.

Q I am not talking about twelve months. I am just talking about adding in the one month of December to the first eight days of '72 to give a little a little bit broader base to your analysis.

Let me ask you, did you make an analysis of the December production on a per well day basis?

A No, sir, I did not.

Q You don't know what that would show?

A No, I do not know what that would show.

Q Do you know in a qualitative way that that would show a decline on Conoco's production on a per well day basis?

A Would you repeat the question, please?

Q If you had taken December?

A Yes, sir.

Q As well as the first eight days of '72 and made the same computation, is it not your suspicion instead of this showing an increase on Continental production it would show a decrease; in other words, if you broadened your study?

A If I broadened my study to include December, 1971?

Q Yes.

A I think I can answer your question for you if I might just be permitted to look at these exhibits.

I sure can, if I can take a minute.

I will need to do some arithmetic. If you guys have got the time, I have got the money. You want me to do, again now, Mr. Morris, to be sure I understand you, I want to answer your question. You want me to broaden the scope of this exhibit I have prepared to include December production?

Q Well, if this can be done within a reasonable time.

A It wouldn't take five minutes after I understand what you want.

Q Can this be done for all of the operators here?

A I can't do it. I don't have any--yes--no, I really can't do that, not in some reasonable time.

Q Will the figures as shown by our exhibits 3, 5, and 7 enable the Commission or the Commission staff, if they desire, to make a computation?

A I am sure they could make it, just like I have.

Q The fact remains, Mr. Mattes, you have not presented--let me just make clear what I guess is already obvious. Your study is only for this information on an eight day period.

A My study covers the change in production for all of the

wells of the South Blanco-Pictured Cliffs Pool based on data presented by Southern Union Gas Company for the seven day period ending January 1, and comparing that production to the eight day period ending January 9.

MR. MORRIS: That is all.

MR. PORTER: Anyone else have a question?

The witness may be excused.

Does anyone have a statement to make in the case, statement of position, other than Mr. Morris and Mr. Kellahin? I am sure they will have a few words.

MR. MORRIS: How would you like to proceed, Mr. Porter?

MR. KELLAHIN: I would say we have the burden here. We should have the right to close. We should probably have the right to open, but I would as soon let Mr. Morris go ahead.

MR. PORTER: Do you agree with that, Mr. Morris?

MR. MORRIS: I agree Mr. Kellahin certainly has a burden, which I see as insurmountable.

I will try to be somewhat brief, Mr. Porter.

This, I am sure the evidence here is, of course, very clearly in the minds of the Commission at this point, and I see little need to review the evidence or to try to point out its features.

I would simply ask the Commission in considering the evidence that has been presented to consider the nature of the case that has been presented here by Continental, the quality of

the case, the quality of the evidence presented.

The case that has been presented by Southern Union, frankly, Southern Union, I am sure any purchaser considers it quite an important case, quite a serious matter to be charged as we have been charged by this Application on a violation of a Common Purchaser Act, and unreasonable discrimination.

The only thing unreasonable, we believe, in this matter is the fact that we are being charged with the violation of this Act.

Now, Mr. Kellahin, Continental, I don't mean Mr. Kellahin, but Continental has attempted by this proceeding to put blinders on the Commission, to say to the Commission, "You can only look at one aspect of what is going on in the South Blanco-Pictured Cliffs Pool. That is simply a difference in facilities afforded."

We admitted in our opening statement to the Commission that there were differences in the facilities afforded.

Mr. Haseltine on the stand freely admitted that there are differences in the facilities afforded in this Pool.

The question before the Commission is whether the differences in facilities afforded are unreasonable in view of the other factors that by Statute the Commission is charged to consider in considering whether there has been ratable taking in the field.

You consider the question of whether there is unreasonable discrimination, as has been, I think, hammered at time and again

throughout this proceeding, not only is the question of equivalent facilities a factor to be considered by the Commission, but of course, the questions for consideration are pressure price, length of time the gas is available to the gas purchaser, quantity and quality of the gas available.

Now, we believe that the evidence here has shown that the differences in price, the differences in the quality of the wells, of course, affects the quantity and, if you will, the quality of the gas as well as the difference in the length of time that the gas is available to Southern Union.

All of these things are factors which heavily offset the differences in facilities afforded to Continental in this case. It was not Continental that came forward in its own case, as we believe it should have, as we believe it had the burden to do, that came forward and made the comparisons that the Commission is charged by statute to make in a case of this sort.

It was Southern Union that came forward with the evidence on which the comparisons could be made.

We produced evidence relating to all of these factors, not only on the Continental wells, but on the wells of other producers connected to Southern Union's Gathering System, so that the comparisons could be made by the Commission.

We believe it has been pointed out to the Commission here that price considerations are an integral consideration in not only this pool but in the gas business general in the San Juan

Basin, to be considered along with the facilities afforded.

As Mr. Haseltine testified this morning, that after these gas purchase agreements are entered into and negotiated, signed, then the purchasing company proceeds on the basis of these purchase contracts that have been freely entered into, arms length contracts, to design their gas gathering systems, to design the pressures at which they will operate, and not only does the purchaser know but the producer knows that in his negotiation of these gas purchase agreements the price that he is willing to accept will have a bearing upon the pressures that he has a right to expect in the gathering system to which he will be connected.

Now, part of the Common Purchaser Statute relates to what constitutes unreasonable discrimination, and as we have pointed out, the reasonable differences in prices paid, facilities afforded, will not be considered if they bear a fair relationship to the other various factors to which we have referred.

We believe the testimony here shows that they do bear, that the differences that are shown here between all of these factors do bear a reasonable relationship to each other, so that there is no discrimination against Continental, just as there was no discrimination against its predecessor, the Humble Oil & Refining Company at the time they entered into this contract.

We would like to call the Commission's attention to Sub-section F of the Common Purchaser Statute, which we mentioned at

the beginning of this proceeding, which in effect says to the Commission that the Common Purchaser Act shall not be applied to require the purchaser to take gas under a pressure that would be uneconomic or unsatisfactory to the gas purchaser as to its gas transportation facilities then in service.

In other words, the Act cannot be applied so as to require Southern Union, in this case, to make an expenditure of funds to place new gas transportation facilities in service.

This, I believe, is in keeping with the general rule of law that the Conservation Commission, and perhaps other types of administrative agencies, should not construe their statutes to require as an affirmative act the expenditures of funds, in this case on the part of the gas producer--excuse me--the gas purchaser.

Now, throughout this hearing, Continental has referred to its correlative rights being violated.

We believe the Common Purchaser--well, let me back up--we believe that the definition of correlative rights as set forth in our statutes should be examined.

This starts off saying it is the opportunity afforded to the producer to produce his just and equitable share of gas, which is then defined, further defined.

We believe in a prorated gas pool that opportunity is afforded the producer through the Commission proration formulas and procedures.

Now, in order to avail itself of that opportunity, Continental here has several alternatives, several avenues open to them.

In the first place, a producer can alter his own correlative rights by waiving, by abandoning the correlative rights that he would otherwise be entitled to.

For instance, let's say for some reason Continental wishes to make an agreement under which it would not produce a well for a given period of time, for some consideration, certainly it would have the authority to do that.

Could it then come to the Commission and say that its correlative rights were being violated because under that agreement it wasn't producing any gas? That is an extreme situation, but it is not too extreme, because in essence that is really what we have here.

Continental is the successor to Humble in this contract. If they made, if Humble made a bad agreement or if Continental made a bad agreement when it took over and purchased this system from Humble, or from Humble's successor, Southern Union should not be made its whipping boy, and certainly the Commission should not be placed in a position of doing the whipping for Continental.

If they made a bad deal, we submit that they have to live with it.

By contract, we submit, that Continental or any other producer can alter its correlative rights.

It can waive its correlative rights, because the proration formula that this Commission administers affords the opportunity required by the statute to the producer to produce his share of gas in the pool.

From that point on, if the producer wishes to abandon or alter that right by contract, it certainly can do so, and we submit Continental and its predecessors have done so in this case.

We are not saying they have abandoned their correlative rights.

We say that they have modified them somewhat by contract.

Now, there was some suggestion made. It was very--I think it came up only once in the hearing--that there was some aspect of waste involved here.

I believe Continental suggested that premature abandonment might result if it did not obtain relief.

First, let me say what is, I am sure, obvious, that at some point in the life of a pool, some point in the life of a well it will be abandoned.

If the economics were not a factor, that well, whatever well it is we are talking about, could continue to be produced until the very last Mcf was dragged out of the well, but obviously there is some economic cut-off point at which the well will be abandoned.

Now, I think it has been shown in this case that the

economics of gas production and gas gathering are related to this pressure relationship.

It is very significant that Continental has the opportunity reserved to it in the contract of installing its own compression facilities to raise the pressure of gas in order to produce that gas into Southern Union's line.

If it wishes to avail itself of that right, then certainly it has the opportunity afforded to it to not only protect its correlative rights but to prevent premature abandonment.

We believe the Common Purchaser Act itself is a very specific provision of the application of protection of correlative rights.

We do think that the Commission has to go back to the general definition of correlative rights to answer the question that is provided in this case.

We think the single issue in this case is whether there has been unreasonable discrimination, and we believe we have answered that question in the negative, that there has not been unreasonable discrimination, that the differences in facilities afforded do bear a reasonable relationship to the other factors that the Commission is charged to consider, and we respectfully ask that the Commission deny the application of Continental Oil Company in this case.

MR. KELLAHIN: I believe Mr. Morris actually put his finger on the controversy. It is just a difference in

interpretation that we are talking about.

Their witnesses and ours have both shown there are differences in the facilities afforded Continental Oil Company, and I might add, other operators on the eastern leg of this section which has been referred to as the Jicarilla Section, as compared to the facilities afforded on the western leg of it and the northern segment.

The contention seems to be that because of the differences paid Continental for its gas, the difference in gas facilities is justified and reasonable.

Now, in the first place, I feel Mr. Morris, or as I should say, Southern Union Gas Company, is misinterpreting the Statute.

The Common Purchaser Act does not in any way connect price and facility afforded.

It doesn't say "The transportation facilities afforded shall be modified by the price of gas."

At no point in this entire section.

All it says is that purchases shall be made without unreasonable discrimination in favor of one producer against another in, one, the price paid; two, the quantities purchased; three, the basis of measurement; four, the gas transportation facility.

In other words, there are those four different items on which there can be no discrimination, and you don't couple them and say one modifies the other.

Now, you go on down in the section, and that is what they appear to be relying on, the statute says for the purpose of this Act reasonable differences in prices paid or facilities afforded, or both, shall not constitute unreasonable discrimination if such differences bear a fair relationship, and this is the only thing you can consider on the prices paid or the facilities afforded, if they bear a fair relationship to differences in quality, quantity, or pressure of the gas available or the relative length of time during which the gas will be available to the purchaser, and the only point they could make in that entire section is the relative time the gas will be available to purchase.

That is four more years as far as Continental is concerned, and if they afford us proper facilities, they could probably have it longer.

The difference in the prices paid and the facilities afforded have no relationship to each other.

The statute says you have got to furnish substantially equal facilities, and you have got to pay substantially equal prices, and that reasonable differences in prices paid or reasonable differences in facilities afforded would be permitted, and that is only natural.

Now, when we consider the enforcement of the Common Purchaser Act, we do have to consider correlative rights, because the purpose of the Common Purchaser Act, and the

Commission--and I won't burden you with reading all of the provisions of the gas proration statutes with which you are thoroughly familiar. I will only say that the Commission well knows correlative rights mean the opportunity afforded to the owner of each property in a pool to produce without waste his just and equitable share of the oil and gas in that pool.

That is what we are asking for.

I think it is highly significant that that statute was adopted in 1935, and the Legislature in its wisdom seemed to feel that it was deficient, so in 1949 it adopted that portion of the Common Purchaser Act applying to gas transportation facilities.

Now, when we get into this question as to whether the Commission's proration formula protects our correlative rights, as Southern Union contends, and gives us our opportunity to produce our just and equitable share, we will be forced to agree with him, if all of the wells were proratable wells, but as we pointed out in our opening statement, and as we pointed out throughout our testimony, the very fact that the pipeline company, by manipulation of its pressures for whatever purpose it may be done, can change a well from marginal status to non-marginal and change a non-marginal well back to a marginal status certainly indicates that the Commission must consider the facilities afforded if its proration orders are to serve the purpose and function for which they were designed.

Now, we contend that the proration formula in the past has not afforded Continental Oil Company the opportunity to produce its just and equitable share of gas underlying its lands in this pool.

I think this is amply demonstrated by the fact that Southern Union when it reduced its line pressures changed the status of twelve of our wells from marginal to non-marginal, which fact has not yet been recognized in the Commission schedule, I admit, but on the basis of production properly should, they should be classified now as non-marginal because they have shown an ability to produce the proratable allowable, or we contend, and I think our evidence shows, that if we are afforded substantially the same pressures that are afforded other operators in the pool, including Caulkins Oil Company and Southern Union Production Company, we will be able to produce substantially more gas, which is our just and equitable share under the Commission formula, because when those wells become proratable wells the operation of the formula does give us our share of the gas.

This is, unfortunately, one of the deficiencies in our proration system which we just must recognize. A marginal well in the past has been operated at the will of the pipeline company and the operator has had no remedy other than to come to the Commission, as we have done here.

Now, I think a little quotation from our friend Ben Hall in

this regard might be appropo, in an address he made at the Southwestern Legal Foundation in their Fourth Annual Institute.

Mr. Hall pointed out that either purchasers under natural gas contracts have succeeded by and large in satisfying the producers or the producers have not objected to the drainage of gas reservoirs, for there are few cases on the subject of the ratable take of gas.

We are not satisfied. We feel we have been harmed, and we are here asking for relief at the proper forum, the one which can give us relief.

One other point here. That Southern Union's position has been that there is a fair relationship between the pressures afforded us and the price paid for gas.

Very well. When we started looking at this situation in 1968, the pressures in this north segment already were 322 pounds, and in the Continental lease down here they were 490 pounds on the L, M, N, O leases over here they ran from 474 to 511 pounds.

In 1969 we had pressures to 287 pounds at this point.

Down here we had 470 pounds, and over here, 485 to 498 on the L, M, N, O leases.

Now, in 1970, just prior to the reduction in the line pressures which was made by Southern Union Gas Company, and while perhaps our complaints didn't cause them to put in these facilities, certainly we had been complaining, and we get reduced line pressures.

The pressures on the Caulkins area, the Lowerie line, I am talking about the wellhead pressures, were up to 459 pounds.

Down here we were--I mean--no, I am sorry, 267 pounds on the leases here.

They were on the order of 459 pounds, and over here they ran from 457 to 494.

Our present most recent data, which I think is substantiated by all of the evidence here, the present pressures up here are on the order of 189 pounds.

Over here we have 250 pounds, and down here 285 pounds, so in spite of the fact that there have been reductions in line pressures, there still is a substantial pressure differential, depending on which well you may look at, from 60 to 50 pounds between the facilities afforded here on the northern segment and the facilities afforded here on the mid-portion of the eastern segment.

By no stretch of the imagination can those be said to be related to point to 5¢ per Mcf, which is what we are getting in addition over and above the 13¢ that Caulkins Oil Company is getting.

We would gladly trade our .25 cents for the same line pressures, because we would make that, make that up in additional production, as Mr. Mattes' testimony has shown.

Now, basically what we are talking about here is summed up by Summers on his oil and gas treatise, section 77--54, commenting

on the Common Purchaser Act, Summers has this to say:

If all of our producers in a common source of supply have equal opportunity to sell or to transport oil and gas from their wells and they are not afforded the opportunity to produce their just and equitable share of the oil or gas or to utilize their just and equitable of the reservoir energy, viewed in this light, there is no doubt of the constitutionality of the Common Purchaser Act.

All we are asking for, really, is our opportunity to produce our just and equitable share, which we contend has been denied to us by the high line pressures maintained by Southern Union Gas Company.

Now, we are not asking for ratable take for Continental Oil Company. What we are asking for is ratable take from the South Blanco-Pictured Cliffs base pool that affects every operator in the Pool, all of whom we feel should have an equal opportunity to produce his gas, and we are fighting the battle as much for Aztec and Southern Union Production, or any other of the other operators. If they see fit because of their corporate relationship not to come in and ask for it, this is their business.

We feel we have been penalized and we are asking for it.

When you come to the question of how can the Commission do this, as has been pointed out, the Commission can't require a pipeline company--and I'd say by the same token--a producer to spend money.

I will agree with that. We are not asking Southern Union Gas Company to take any specific action in the way of buying new compressors or facilities or putting in more pipes, or anything else.

What we are asking them to do is furnish us with substantially the same pressures as they are affording to Caulkins Oil Company or to any of the other operators in the Pool.

Now, those pressures may be higher or lower, and I certainly would be happy to sell them lower, because we will produce more gas, but if they raise the pressures on the other wells to the same pressures we have under the Common Purchaser Act, we have no grounds for complaint. This they can do without buying any more equipment.

We prefer to see them install more equipment or operate with the present equipment they have in such a fashion that these pressures can be equal.

We feel it can be done. We don't ask the Commission to tell Southern Union what to do. All we do ask the Commission to do is tell Southern Union Gas Company what results you expect them to achieve, which we feel should be substantially equal pressures throughout this system.

Now, in entering such an order, we, of course, have to recognize that pressures are not going to be equal. The laws of physics are not going to permit that, but we feel that present pressures go far beyond any differences which should be observed

under the normal operation of a company conscientiously trying to equalize pressures in their system.

We would further propose that if the Commission sees fit to enter such an order, they hold the case open for an examination of the results achieved at some reasonable future date. I think this would be only proper both for Southern Union Gas Company and for Conoco Oil Company and the other operators.

In that connection, I would ask permission to file in the near future with the Commission a proposed form of order, and of course, we will furnish a copy to Southern Union Gas Company.

Thank you very much.

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

As to the request for permission to file the proposed order, why the Commission will allow the Applicant to submit a proposed order.

Do you have any comment, Mr. Morris?

MR. MORRIS: Well.

ME. PORTER: He indicated a copy of the order would be submitted to Southern Union.

MR. MORRIS: In this event, Mr. Porter, we would, of course, like to have the opportunity to respond by commenting on the proposed order to the Commission, and of course, the proposed order that Southern Union would present would at least be very brief as to the ordering portion of the order.

However, I think it would be appropriate for us to submit

our own proposed order to contain the findings of fact that we would propose the Commission to make, so in that light we would make the same request that we have some period of time, at least two weeks, to submit a proposed order.

MR. KELLAHIN: If the Commission please, may I ask a question? You say time to respond. You mean by submitting a proposed order of your own?

MR. MORRIS: Well, I think that would be sufficient, Mr. Porter.

MR. PORTER: Well, suppose the Commission would allow each party here to submit a proposed order within fifteen days. Is that sufficient time?

MR. KELLAHIN: Fine.

MR. PORTER: In the case there has been some reference made here to a whipping boy, so I guess the Commission should give some consideration as to who is the whipper and who is the whippee, and so we will take the case under advisement and the hearing is adjourned.

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I N D E X

E X H I B I T S

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, RICHARD STURGES, 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 that the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Richard W. Sturges
CERTIFIED SHORTHAND REPORTER