BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE NO. 1383

TRANSCRIPT OF PROCEEDINGS

FEBRUARY 26, 1958

DEARNLEY - MEIER & ASSOCIATES
INCORPORATED
GENERAL LAW REPORTERS
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I N D E X

MARTIN E. DEHLINGER

RAY CLARK

JOE M. PARSLEY

BEFORE THE
OIL CONSERVATION COMMISSION
February 26, 1958

IN THE MATTER OF:

Application of Forest Oil Corporation for a dual completion. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its State "A" No. 1 Well located 660 feet from the North line and 660 feet from the East line of Section 26, Township 16 South, Range 33 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the Wolfcamp formation adjacent to the Kemnitz Wolfcamp Pool through the casing-tubing annulus, and to permit the production of oil from an undesignated Pennsylvanian Oil pool through the tubing.

Case No. 1383

BEFORE:

Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The hearing will come to order, please. The next case on the Docket will be case 1383.

MR. COOLEY: Case 1383. Application of Forest Oil Corporation for a dual completion.

MR. CHRISTY: Sim Christy, of Hervey, Dow, and Hinkle for the Applicant Forest. We have three witnesses. The first one is Mr. Dehlinger. Will you stand and be sworn, please.

MR. UTZ: Will there be any other appearances in this case?

MR. KELLAHIN: Jason Kellahin, and I want to make a

statement at the conclusion on behalf of Amerada.

MR. COOLEY: Any other statement or appearances of any sort?

(Witness sworn.)

MARTIN E. DEHLINGER

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

DIRECT EXAMINATION

BY: MR. CHRISTY:

Q Would you please state your name, address, and occupation.

A My name is Martin E. Dehlinger, 3423 West Story Street, Midland, Texas. I am a geologist for the Forest Oil Corporation, Midland, Texas.

Q Have you ever testified before this body?

A No, sir.

Q Mr. Dehlinger, what forms of higher learning do you have, and what degrees do you have, and from what institutions?

A I have a bachelor of science degree in geology, 1951, Texas College of Mines and Metallurgy, have a master of arts in geology, 1951 -- I didn't mean that, 1948, excuse me -- a master of arts from the University of Texas, 1951, and since graduating from the University of Texas, I have worked for the Humble Oil and Refining for about a year and a half, the Murphy Corporation for a year and a half, Forest Oil Corporation about two and a half years.

Q Is this work -- excuse me.

A And with all of those companies I have acted in the capacity of geologist.

Q Have you ever testified before any other regulatory bodies? A No, sir.

Q The lands involved in this application are in Township 16 South, Range 33 East, NMPM Lea County, New Mexico. Are you familiar with that general area and the geology in connection with it?

A Yes, sir, I am. I am the district geologist for Lea County for Forest Oil.

MR. CHRISTY: Does the Commission have any questions concerning the witness' qualifications as a geologist?

MR. UTZ: The witness is qualified as an expert witness.

Q (By Mr. Christy) Mr. Dehlinger, I hand you Applicant's Exhibit 1 and ask you if you will please identify it.

A Exhibit 1 is a structure map contoured on the top of the Kemnitz lime which is a Wolfcamp lime, which produces in the Kemnitz field.

Q Does Exhibit 1 reflect the other Wolfcamp wells in the general vicinity of the subject well and show the names of the offset operators to the subject well? A Yes, sir.

Q I believe your offset operators are Humble, Shell, Tennessee Gas, Phillips, Cities Service, and Signal?

A Yes, sir.

Q Is that correct? A Yes, sir.

MR. CHRISTY: We have here waivers from all of the offset operators with the exception of Sinclair, who have been notified of this hearing.

Q (By Mr. Christy) Now, returning to Exhibit 1, Mr. Dehlinger, woul you please locate the subject well for us?

A The well in question is the Forest Oil No. 1 State "A" located 660 feet from the north and the east of Section 26, 16, 33.

Q Now, I notice just below the subject well, another well circled in red. You have a figure there. For example, subject well's minus 8462. Would you explain that, please?

A The minus figure under the circled well is the datum on top of the Kemnitz lime formation, the Kemnitz lime produces in the Kemnitz field.

Q And this Kemnitz Wolfcamp production is one of the productions encountered in the subject well?

A Yes, sir.

Q Now, from this contour on Exhibit 1, have you arrived at any conclusions as to whether or not this is a continuous formation and pool in the wells shown and producing in the Wolfcamp?

A The wells producing in the Kemnitz field seem to indicate that the Kemnitz lime pay is a continuous body, which is represented by the occurrence of a porosity in the Kemnitz lime. In other words, this map seems to suggest that the Kemnitz field is a stratigraphic

field, depending upon the presence or absence of porosity.

Q Is it similar to the Townsend?

A Yes, sir.

Q General vicinity of the east --

A Yes, sir. The Townsend field produces from an equivalent zone in the Wolfcamp, and the west end of the Townsend field is about four miles to the east of us.

Q Now, also based on this, have you arrived at any conclusions as to whether or not in your opinion drainage is occurring at the present time under the Wolfcamp in the subject well?

A It is believed that we are being drained in the Forest No. 1 "A" State in Section 26 by the Kemnitz field as a whole, and specifically by the Tennessee Gas No. 3 "B" State Kemnitz in Section 25.

Q All right sir, I will refer you to Applicant's Exhibit 2 and I will ask you if you will identify that instrument for us.

A Exhibit No. 2 is an isopach map of the net microlog porosity found in wells penetrating the Kemnitz lime porosity.

Q And of what benefit might this exhibit be to the Commission in consideration of the application?

A This map, when compared with Exhibit 2, suggests and bears out our statement that the Kemnitz field is less dependent on structure than on presence of porosity for its production. In other words, this is another indication that the Kemnitz Wolfcamp

field is a stratigraphic field.

Q Is this a water drive field?

A No, sir. Our information now indicates it is a gas solution drive field. Only three wells in the Kemnitz field proper, and I will quote the wells; the Tennessee Gas No. 1, State-Phillips, in the southeast corner of Section 25, 16, 33; the Tennessee Gas No. 5 "A", State-Kemnitz, in Section 30, 16, 34, and the Shell No. 1 "WC" State, in the South Half of Section 29, 16, 34, only those wells had indications of water in the Kemnitz zone.

Now, you will notice on this exhibit there are two figures under each of those wells. The top figure, and I specifically refer again to the Tennessee Gas No. 1, State-Phillips, you have 78 feet there, that indicates you have 78 feet of net microlog porosity in that well, but there is a figure under there, a figure 42 feet, that indicates only 42 feet of the available porosity was above the field water table. The field water table is estimated to be at a minus 6670.

Q Now, the figures then shown below each of the wells circled in red here on Exhibit 2 represent the net feet of porosity as distinguished necessarily from pay?

A Yes, sir, specifically in the three wells previously mentioned. However, in the remainder of the wells in the Kemnitz proper, the net microlog porosity is tantamount to being the net pay. Of course, this net pay varies in quality of the porosity

as well as in quantity.

Q Now, I refer you to Applicant's Exhibit 3 and ask you if you will identify it, sir.

A Exhibit No. 3 is a structure map contoured on top of the Seaman lime, which is a Pennsylvanian lime and which is found in all of the wells that have been drilled in the Kemnitz field proper and in several of the other wells in the area.

Q What benefit might Applicant's Exhibit 3 be in the consideration of this application, what does it purport to demonstrate?

A This structure map also strongly suggests that the Seaman lime pay is of a stratigraphic type accumulation. I specifically refer to three wells, the Sinclair No. 1 Seaman unit, which is located in the southeast corner, Section 13, 16, 33; the Forest 1 "A" State, Section 26, and the Penrose No. 1 TGP "C" State in the southeast corner of Section 34. All of those three wells are circled in red on the exhibit.

Now, if you will compare the datums on top of the Seaman lime as marked below the well, you will notice that the Forest well is approximately 245 feet low to the No. 1 Seaman unit, and the Forest well in turn is approximately 180 feet high to the Penrose well. These zones appear to be stratigraphically equivalent, but they are definitely not structurally equivalent, suggesting that a stratigraphic trap has been penetrated by each of the wells.

Q Is there any indication of communication between the stratigraphic traps encountered in the three wells you mentioned?

A No, sir. There seems to be evidence to the contrary because of the well characteristics. For example, the Penrose well in Section 34 in the Seaman zone has extremely high pressures, and they potentialled the well for an extremely high potential, whereas our well, the Forest 1 "A" State in Section 26 seemed to have abnormally low pressures as demonstrated by the original drill stem test in the equivalent zones, and our well does not seem to have the capacity of the Penrose well.

Q Geologically speaking, does this present an unusual situation, the Seaman zone in this area?

A The Seaman zone in this area seems to be rather unique in its erratic nature, and what at this moment seems to be a discontinuous nature also.

Q Have you ever encountered this unusual type situation before, or have you made studies in connection with such a situation as this?

A I cannot personally cite any other field that appears to have this exact same occurrence, but a professional bulletin, the bulletin of the American Association of Petroleum Geologists, Volume 14, No. 11, has an article which seems to be applicable to this instance, and the article is on the Mississippian bioherms of Northeast Oklahoma. That article seems to set forth a condition, a sedimentary condition very much like we find in our area in that you have a porosity developed along the flanks of a reef which has a very massive dense core, the sides of which project these

dense fingers of the reef, and intercalated between these fingers you have porous zones developed, which are not particularly continuous vertically or horizontally.

Now, the massive reef core would, of this reef, would be more or less represented by the Line A-B on Exhibit 3. The Line A-B more or less represents the axis of the main, the long axis of the main reef core, and the short axis represented by the Line C-D.

Now, you'll find that the porosity developments which are associated with this reef seem to be very discontinuous and on the flanks of it.

Q Now, what are the primary problems that you encounter in this unusual type of situation?

A The ability to predict the absence or presence of porosity, which is the governing feature of this type of reservoir.

Q Can't you predict that geologically or geophysically?

A There seems to be no way to geologically or geophysically predict porosity in that, except drilling for it.

Q And these are small isolated traps, as I understand you, along the flanks of the fingers which you mentioned?

A Yes, sir.

Q These four producing wells on Exhibit 3?

A Yes, sir.

Q Now, are you familiar with the other wells drilled in the general vicinity of the subject well?

A Yes, sir.

Q Do you have any logs from any of the other wells in the general vicinity?

A We have logs, electrical logs on the Sinclair No. 1 Seaman, Section 13, the Forest 1 "A" State, Section 26, the Penrose, Section 34, the Tennessee 1 "B" State-Kemnitz, Section 25, the Tennessee 1 State-Phillips in the southeast of 25, and a log on the Pure No. 1 State "E" in 16 South, 35 East, Section 21.

Q Now, do the logs reveal any data which might be of assistance to us in consideration of this application?

A The logs seem to indicate that you have a thinning and thickening of the Pennsylvanian section in which the Seaman lime is found, and you also have a thickening and thinning presence, or absence of porosity in the Seaman lime. The last feature is specifically demonstrated comparing the Forest 1 "A" State with the, in Section 26, with the Tennessee 1 "B" State-Kemnitz in Section 25. The micrologs indicate that the Forest 1 "A" State has about 52 feet of net microlog pay or porosity in the Seaman lime, whereas the Tennessee 1 "B" State-Kemnitz in Section 25 had no porosity in that zone. That is the net microlog porosity. The values are not under the subsea datums of the subject well.

Q In which exhibit, sir?

A In Exhibit 3.

Q Now, on these electric logs of the wells that you have mentioned, was any water found in the zone, in the Seaman zone in

any of the wells?

A No water has been found in the Seaman lime zone in the producing wells, or the wells drilled to the Seaman zone in the Kemnitz field proper.

Q Now, as I understand Applicant's Exhibit 3, the Seaman, the Forest, the Penrose, and the Pure are Pennsylvanian producers in the Seaman formation? A Yes, sir.

Q And the other three -- the other two, Tennessee 1 "B" and Tennessee 1 Phillips are not producing in that formation, but were drilled to it? A Yes, sir, they were.

Q Now, sir, is there any other Seaman production in that area?

A The Pure No. 1 "E" State is the only other Seaman lime production in the area.

Q Now, were any other Seaman wells drilled other than those which you have mentioned and the logs that you have?

A There have been about twenty wells that have penetrated this section in the immediate area. I am taking in, say five miles in any direction from the Seaman No. 1 or the Sinclair No. 1 Seaman unit in Section 13.

Q Those are the ones indicated in Applicant's Exhibit 3 in green or red? A Yes, sir.

Q All right, sir. Do you have any, or have you formed an opinion as to why these other Seaman tests did not produce?

A The wells that penetrated the Seaman zone but were not

capable of production found either the section was missing or there was no porosity development in the Seaman lime, and it appears that the Seaman lime is reasonably well distributed over the area, but the porosity is very seldomly developed.

Q Were Applicant's Exhibits 1, 2, and 3 prepared by you or under your supervision? A They were.

Q As a geologist, can you think of any other matter which you feel should be brought to the attention of the Examiner in connection with the application?

A No, sir, I cannot.

MR. CHRISTY: We would like to, at this time, offer in evidence Applicant's Exhibits 1, 2, 3, and 3-A through 3-E inclusive.

MR. UTZ: Is there objection to the entrance of the Applicant's Exhibits as stated? If there are no objections, they will be entered.

MR. CHRISTY: We have no other questions of this witness. We will attempt to develop the production problems, the mechanics of it from other witnesses. This is all we have on the geological portion.

MR. UTZ: Are both your other witnesses engineering witnesses?

MR. CHRISTY: They are. Production engineer and reservoir engineer.

MR. UTZ: Are there any questions of Mr. Dahlinger?

MR. NUTTER: I have some questions.

MR. UTZ: Mr. Nutter.

CROSS EXAMINATION

BY: MR. NUTTER:

Q Mr. Dehlinger, you have frequently in your testimony referred to the Kemnitz zone and the Seaman zone. What is the Kemnitz zone more commonly called in this pool?

A The Kemnitz Wolfcamp, I think, is the field designation.

Q That is the zone that is producing from the pool designated by the Commission as the Kemnitz Wolfcamp pool?

A Yes, sir.

Q Now, this Seaman zone that you have referred to, what is that more commonly called?

A I think the Commission has called the Seaman zone in the discovery well, the Sinclair No. 1 Seaman unit in Section 13, the Kemnitz Pennsylvanian.

Q Thank you. I just wanted to clarify that for the record.

A Yes, sir.

Q Mr. Dehlinger, you have mentioned the Townsend Wolfcamp pool in your testimony, and that this was a similar type of structure, you felt? A Yes, sir.

Q Do you think that the producing characteristics of the Wolfcamp zone in this pool would be similar to the Wolfcamp producing characteristics in the Townsend pool?

A Yes, sir, it appears that the conditions of accumulation

were the same, and they seem to be statrigraphically equivalent, and the reservoir types are basically the same, and the well performances seem to be of the same type as found in the Townsend.

Q As I recall, at the hearing which was held in May, 1957, to establish 80-acre spacing for the Kemnitz Wolfcamp pool, various geologists and engineers compared the two pools and stated that they believed they were equivalent in many respects. You don't have any quarrel with that evidence or testimony, do you?

A No, sir.

Q You concur with it?

A Yes, sir.

Q Do you have any knowledge as to what the gas-oil ratios are in the Townsend Wolfcamp pool?

A No, sir, but I understand they are high.

Q I hand you the Commission's proration schedule for February, 1958, on Page 98, on which starts the listing of the wells in the Townsend Wolfcamp pool, and on the right hand side of the listings for each well are listed the gas-oil ratios as reported by the Commission. Are those gas-oil ratios high, intermediate, or low as far as the average oil pool is concerned?

A I would say they are intermediate. They are definitely not low.

Q Are there a number of wells in that pool that have penalized allowables as a result of high gas-oil ratios?

A In the Townsend?

Q Yes, sir.

A Yes, sir, there are.

Q You stated that you thought this was a gas solution drive field?

A Yes, sir.

Q Do you think that -- First, I'll ask you this, has any well which has been completed in the Pennsylvanian zone in this pool been offset by another well drilled to that same formation, completed in that same formation?

A The Sinclair No. 2 Seaman unit in Section 29, 16, 34 was drilled, and the southeast diagonal offset to the No. 1 Seaman unit was drilled as an offset to the Sinclair No. 1 Seaman, and it unfortunately did not, or could not be completed commercially from the Seaman zone. Also, the Pure 1 "E" State, Section 21, 16, 34, was offset to the west by the Tennessee No. 2 State "B" which apparently, according to my correlations, is producing from a zone not equivalent to the 1 "E" State. It seems to be from a lime stringer above what we would call the Seaman zone.

In the Seaman zone, the Tennessee well had approximately three feet of net microlog pay, and so they had to plug back up and complete it from this other zone, which appears to be very close to the absolute top of the Pennsylvanian.

The Pure No. 2 State "E" in the South Half of Section 21 was also drilled to the Seaman zone, the one producing Pure well, but it found no porosity and consequently was plugged back and made a Wolfcamp well.

Q So to date, no well which is producing from the Pennsylvanian has been offset by another producer in that zone?

A No, sir.

Q And you stated that in your opinion there was no communication among any of the four wells which have been completed in the Pennsylvanian, didn't you?

A Yes, sir.

MR. NUTTER: I believe that's all, thank you.

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

MR. STAMETS: I have some.

QUESTIONS BY MR. STAMETS:

Q Mr. Dehlinger, can you divide this area into a battery, this reef structure?

A It is a very nebulose thing. It is difficult to do. I would say that to the northwest of the Sinclair No. 1 Seaman unit is a battery for lagoonal sedimentary environment. The Phillips Well in Section 13, 16, 33, and the Skelly Well in Section 12 both seem to be lacking the lime development in the Seaman zone.

Q Did I understand you correctly to say that the Seaman lime was locally missing? Is that the entire section there, or just the lime?

A Either the lime or the porosity. More specifically, the porosity is missing locally. You can carry the Seaman lime, or its equivalent reasonably widely. You can find it over in the

Townsend area, but now, you can take, for instance, the previously mentioned Skelly and Phillips well, and they seem to be in an area where something happened to the Seaman lime.

Q Is that a battery area that you would expect some sand in the reef.

A Not specifically sand, I don't think, but if you will compare the Tennessee Gas No. 1 State-Phillips in Section 25 to the Tennessee Gas No. 1 "B" State-Kemnitz in the north half of Section 25, you will see that the Seaman lime unit in the 1 "B" Kemnitz, the northern most well there had no porosity, but that in the No. 1 State-Phillips, the lime had turned to shale, or it seems to be shaling up. Although we don't have a log here to represent it, I think the Humble well in Section 1, 16, 33, seems to have an unusual amount of sand or sandy shale in the Pennsylvanian section.

Q Just one more question. What are your other types of sediment which don't seem to have any porosity material?

A I don't think I really understand your question.

Q In the main reef area, I think it is safe to assume that these wells weren't completed in the lime stone because the lime stone had poor porosity, but these wells, say in Section 2 and Section 3 of 16, 33, which penetrated that zone and weren't completed in that zone, what type of sediment do they have?

A They had a lime equivalent, but it appears the porosity was absent in these wells, specifically the Humble 1 "AQ" State

there in Section 3, and a Humble well not shown on this plat, but over in Section 4, the southeast corner of Section 4, both wells were completed as Pennsylvanian producers from zones which roughly speaking are equivalance of the Townsend, but they had a, they were completed apparently as gas wells, but they produced -- As I understand it, the 1 "AQ" produced eight thousand barrels of oil total, and that was it, and the Humble well in Section 4 was completed, or potential flowing for somewhat over five hundred barrels per day, and by the time that the White Eagle well in Section 10, before it could get down, why its diagonal northwest offset had been depleted and plugged, and the White Eagle well completely missed the porosity also.

Q These three wells on the west side of the reef, or what would seem to be the west side of the reef, seem to form rather a straight line through there. It is reasonable to assume that one could get a producing well in that zone interspersed between these wells?

A The question there comes in of the structural relation of the wells. In other words, the great variation in the datums, like the Forest well in Section 26 is about 200 feet low to the Seaman well. It is hard to imagine that that would be one particular and continuous reservoir without having gotten some water, and the difference between the Sinclair well in Section 13 and the Penrose well in Section 34 is 327 feet of difference, sub-sea difference, and it is hard to imagine that such a small

reservoir could be continuous, or such a thin reservoir. The Seaman lime various in thickness from 75 to 150 feet in the area, and it is hard to imagine that that could be one continuous reservoir without having some water, so that you then think that you have a series of porosity developments ranged in sort of a stair-step manner, and that each time you begin to look for a reservoir in the Seaman lime, why you are looking for a brand new reservoir for all practical purposes. That seems to be indicated over here by the Pure Well in Section 21, 16, 34.

Q Well still, it seems you could call it a zone. There is a fairly decent zone there. I don't think Forest Oil would be opposed to finding oil --

A But the question is, would you drill to it. Now, like we are drilling on our No. 2 State "A" there on Section 26 now, and we just don't feel that in view of the present production statistics of these Pennsylvanian wells, specifically the Penrose down there in Section 34, that well was potentialled flowing for fourteen hundred and some odd barrels, I think, that may not be an exact figure, but now it is dead. It is completely dead, in less than four months. That thing has gone from fourteen hundred barrels to virtually nothing.

MR. STAMETS: That's all.

QUESTIONS BY MR. NUTTER:

Q What is the cause of that? Wouldn't it make anything with the pump?

A No, sir, they don't have a pump, but I think they originally acidized it with five hundred gallons of mud acid, and then they potentialled it. About a month later they acidized it with ten thousand gallons, and they could get only about twenty or twenty-five barrels a day out of it, and then it completely died, and as of yesterday, I think they went in and were going to frac it, and we haven't heard anything after that.

Q They are going to attempt to make a flowing well out of it?

A They are trying to get something, yes, sir, and the indications seem to be that this well, the Penrose well, is similar to the Humble wells up there in Sections 3 and 4 in that you had a very limited reservoir, which was under high pressure, and you got the flush production right fast, and that's it.

Q Do you think the same thing will hold true of your State No. 1 in Section 26?

A The indications are that that is happening, because we potentialled the Pennsylvanian with, let's see, for three hundred and fifty-six barrels a day, and with a tubing pressure of, flowing tubing pressure of eight hundred pounds, and as of the last time I heard, which was yesterday, they had produced two hundred and seven barrels of oil per day, and the flowing pressure was down to three hundred and seventy-five pounds. In other words, it seems to be losing its get up and go. The same productive character in particular, seems to apply to the Pure 1

"E" State over there in Section 21. If I am not mistaken, they completed that well for sixteen hundred barrels or something a day, and they say now that the pressures are way down.

Q How did the initial pressure in your well compare with the initial pressure in the other three wells in the Pennsylvanian?

A We were abnormally low in comparison to the Penrose well in Section 34. I think our initial shutin pressure on the drill stem test of the Seaman zone in the Forest 1 "A" State was about thirty four hundred pounds, or would you let me get some more information?

Q Yes, sir.

MR. CHRISTY: We will try and develop a number of these things with the other witnesses as we go along, Mr. Nutter.

A Could I get him to answer the question on the initial shutin pressure?

MR. NUTTER: We will defer these questions regarding initial potentials and pressures.

MR. CHRISTY: We have another witness to testify as to that. As I said, this is purely for the geologically --

MR. NUTTER: I withdraw the question.

MR. UTZ: Is there any other questions of the witness?

MR. COOLEY: One question.

MR. UTZ: Mr. Cooley.

QUESTIONS BY MR. COOLEY:

Q Mr. Dehlinger, how does the geology compare between you Forest 1 "A" Well and the Tennessee Gas "B" well in the North Half of Section 25 in the Wolfcamp formation?

A In the Wolfcamp we are only slightly low to the Tennessee well, but we seem to have less than half of the net microlog porosity. It seems to be a characteristic of the Kemnitz field that you have three zones of porosity, and the relation between the Tennessee and our well is that we seem to have lost the bottom porosity zone. It is pinched out some place between the Tennessee 3 "B" in Section 25, and our 1 "A" State in 26.

Q What correlations would you say are missing in the well which zones are referred to in Case 1253, Order R-1011, Special Rules and Regulations for the Kemnitz Wolfcamp Pool? Are you aware that Rule 4 of those rules provides, and I quote, "That no well shall be opened to any other zone of the Wolfcamp formation simultaneously with production zone in the lower portion of the formation from which the Tennessee Gas Transmission Company, State "AA" Kemnitz No. 1 "A" Well is presently producing until it has been established, after notice and hearing, that the same can be accomplished without causing underground waste." It prohibits production from the zone from which the Tennessee Gas Transmission State "AA"Kemnitz No. 1 Well.

A It is in Section 30, is it not?

Q Yes, sir. A 16, 34.

Q Now, let's compare it with that zone to which the Order

refers. Is that productive zone missing in your Forest State "A" 1?

A As I understand it, that rule was specifically aimed at the upper Wolfcamp porosity, was it not? It was to prohibit simultaneous production from those zones, from the upper and the lower?

Q It was, yes, sir.

A The rule there separates the zone about six hundred feet above the zone from which we are producing. In other words, what I would call an upper Wolfcamp from the lower Wolfcamp, which I consider the Kemnitz field to be producing, but to answer your question, we did not have the upper Wolfcamp zone in the 1 "A" State. We dropped a core barrel in there and tried to find it, but we were unable to.

Q You do have the lower zone,, which is considered the most proliferant, and which was referred to in Order 1011, which I just quoted? A Yes, sir.

Q And all of your production would come from that lower zone?

A Yes, sir, what is generally considered to be the Kemnitz field pay.

Q Well, it is identified by the Order as that zone from which the State "AA" Kemnitz "A" No. 1 well is presently producing.

A Yes, sir.

Q Top of perforations on that well are at ten thousand

seven hundred forty-two feet?

A Yes, sir. The top of our perforations are approximately ten eight.

Q And would not encompass any of the other and less proliferant stringers which were intentionally excluded from this Order?

A No, sir, it would not. Maybe I misled you when I said three zones.

Q Well, there was a number of zones referred to at that hearing, and everyone agreed upon, understood the significant zones in the Kemnitz "A" 1 well to be the most proliferant zones.

A Yes, sir.

Q And there was some fear at that time that opening both zones simultaneously would cause waste.

A Yes, sir.

Q Thus simultaneous opening was prohibited.

A Yes, sir.

Q But you would not have this problem in your case?

A No, sir, we do not have that.

Q Since the upper and most proliferant zones are completely absent?

A Yes, sir.

MR. COOLEY: That's all.

QUESTIONS BY MR. NUTTER:

Q Now, Mr. Dehlinger, State No. 3 offsetting your well there to the east, is it open in the main Kemnitz zone?

A Yes, sir. Yes, sir.

Q However, it has a certain section of this lower Kemnitz zone which you don't have in your well?

A Yes, sir. Roughly speaking, they have a zone with a gross, let's say a gross pay of a hundred feet, and their fifty-seven feet of net microlog porosity is distributed over that hundred feet in roughly three better porosity zones, whereas in an equivalent gross of a hundred feet in our well, we have twenty-four feet of net microlog porosity in basically two zones.

Q Do these two zones with porosity in your well correlate with any of the zones in their wells?

A Yes, sir, it does, the upper west and lower zone, separated from each other by a hard spot about, oh, it must be, let's see if we can look at the log here. Do we have a Forest log? That would be equivalent to this hard spot there.

Q You are referring to an interval about what depth, Mr. Dehlinger?

A From ten seven eighty-four to eighty-eight would be the hard spot separating the two zones of porosity that are present in the Forest well. Unfortunately, I didn't bring the one on the 3 "B" State.

Q What are these intervals in black as depicted on this log?

A The intervals in black shown on the microlog of the Forest well depicts the distribution of porosity as found by the

measurements of the log.

Q Is that an exhibit? A Yes, sir.

Q On this log which as been identified as Exhibit No. 3-C, there are depicted six areas of microlog porosity, is that correct, Mr. Dehlinger? A Yes, sir.

Q Now, which of these areas -- You are acquainted with the log of the Tennessee 3 well to the east?

A Yes, sir.

Q Which of these microlog porosities depicted on your Exhibit 3-C are present in the log of the Tennessee Gas Transmission Company's State "B" 3 well offsetting yours to the east?

A The upper most zone would be equivalent to Tennessee, 70684, and then roughly you have a hard spot, or tight dense zone, and then you have the second zone which would pick up then at 10788, and then continue down to 107 -- I can't see that, 10802. Those would be equivalent, or the two top porosity zones in the Tennessee Gas No. 3 "D" State-Kemnitz.

MR. NUTTER: I think that's all, thank you.

QUESTIONS BY MR. COOLEY:

Q Mr. Dehlinger, how does the geology on your Forest State "A" No. 1 well compare with the geology on the average of the wells throughout the Kemnitz Wolfcamp pool proper? The quality of the wells.

A The Forest No. 1 State "A" appears to be about average, both reservoir -wise, and its relation to the major sedimentary

conditions forming the reservoir. In other words, its neither high nor low particularly, and it has about what the average net porosity -- Well, I think the average net microlog porosity in the Kemnitz field would be considered at about thirty-four feet. That is just strictly a mathematical average, and we have twenty-four feet. There are wells that have less net microlog porosity than we have, and then there are wells that have considerably more.

Q If that were the only producing formation present in the area, knowing the geology being what it is, would you advise that it be drilled to that formation?

A Yes, sir.

Q If you could undrill that well and know what was there, would you advise them to drill it?

A I think I would move it.

Q No, sir, I mean --

A It didn't come in like we had it drawn originally, put it that way.

Q It wasn't quite as good as you anticipated it?

A No, sir.

Q Is it still a commercial well in the Wolfcamp?

A Yes, sir.

Q The Tennessee Gas Transmission Company's State "B" well No. 3 offsetting your well to the east is a Sinclair completion in the Wolfcamp formation, is it not? A Yes, sir.

MR. COOLEY: That's all the questions I have, thank you.

QUESTIONS BY MR. UTZ:

Q Mr. Dehlinger, you application stated that you were to complete the well in the Wolfcamp from 10,674 to 10,816. That 142 feet, is that whole interval perforated?

A No, sir, it is not.

Q Can you say what interval it is perforated --

MR. CHRISTY: We will develop that, Mr. Utz, with the next witness.

MR. UTZ: All right, sir.

Q (By Mr. Utz) Mr. Dehlinger, was this zone, the Wolfcamp zone cored?

A No, sir, unfortunately we missed the porosity. We got the core barrel in the tight zone below it.

Q With reference to the Pennsylvanian or Seaman lime, you also stated that it was 11,547 to 11,450, 97 -- I presume you would like to defer that question as to perforations to an engineering witness? A Yes, sir, please.

Q Was that zone cored?

A All but the zone represented by your upper five feet of perforations there. All of it was cored.

Q When you--you may want to defer this question--when you rejected this well, was it your intention to drill to the Pennsylvanian?

MR. CHRISTY: I would like to defer that question to the last witness, Mr. Utz, he will be glad to answer it.

MR. UTZ: Is there any other questions of the witness?

MR. CHRISTY: I would like to ask one more question. Everyone else has had a turn.

MR. UTZ: All right, sir.

REDIRECT EXAMINATION

BY: MR. CHRISTY:

Q Mr. Dehlinger, referring again to Applicant's Exhibit 3, would you give us a little more detail on this A-B Line and C-D Line and what it represents in this fingering that you spoke about, and you might make reference to the article which you previously mentioned. I am a little unclear on your mass core.

A The Lines A-B and C-D on Exhibit 3 are roughly the axds of what we consider to be a massive tight reef in this area. In other words, where you do not have porosity, and in reference to the article in the AAPG Bulletin, there on Page 2535, they have what looks like -- it is a picture of a reef found on the surface, which shows a very massive and undoubtedly dense reef mass, and on the flanks of the thing you seem to have a development of porosity along the flanks of it. These local porosity developments are made up basically of a reef detrital, as in our case. Even in our case, while it is of a different geological age, why it is similar to the type of detrital that is

indicated here on Page 2534. It seems to be a mass of broken up organisms which have been, probably were growing on the main reef, but lay activity broke it off and then probably distributed it in the low areas around the rim of the main massive tight reef core, and some of these other pictures in here give you about the same idea, and you can see that where you would have the massive tongues coming out and probably separating the zones which in our particular case refer to the porous zones, and so that there is probably no connection between these zones vertically and probably very little connection horizontally because the horizontal distribution of the reef detrital would depend on the very irregular ocean bottom probably either in the back reef or the fore reef zones, and in this back reef-fore reef zone, it is a pretty hard question to answer.

Q As I understand you, this mass core shown on Figure 7 of the article is represented by your A-B Line on Applicant's Exhibit 3? A Yes, sir.

Q And your entire thickness of the core is shown by your C-D Line, the hung, is that the word, hung?

A Bioherms

Q That is shown on C-D? A Yes.

Q Showing that is the width? A The width?

Q Yes. A Yes.

Q Now, there is a little arrow down here on Figure 7 of the article. Is that where you would obtain production as

distinguished from the center mass core?

A Yes, sir. If you were applying our present situation here to the theory of this thing, why it would be equivalent to having the Tennessee Gas No. 1 State "B" in Section 25 drilled at the crest of the massive reef core, so that you had no porosity developed in the reef, but if you moved down dip slightly in what is our Forest 1 "A" State relation, you would penetrate a finger of tight reef rock and then you probably would go into, or possibly go into a local detrital accumulation where you had the porosity developed, and also the massive reef finger has supplied a trap to the top of the accumulation, so that you have all of the necessary requirements for an oil field, of whatever size when it looks like it is limited.

Q If I put my hand on Exhibit 3 and cup it over toward the southeast and spread my fingers a little, it is in this area between the fingers that you would obtain the production, wouldn't you?

A No, sir.

Q You would obtain it to the side of these fingers?

A Yes, sir.

Q And between the two there would be a hard mass?

A Probably not only between the two, but above and below.

Q Vertically as well as horizontally?

A Yes, sir.

MR. NUTTER: Which direction is your finger pointed?

MR. CHRISTY: Southeast.

MR. NUTTER: Or southwest?

MR. CHRISTY: Southwest. I have no further questions.

MR. COOLEY: Before we proceed, Mr. Dehlinger, did you properly identify this bulletin at the outset. Did you give the full identification of this publication?

A I think I did. I gave the name and the volume and the issue.

MR. CHRISTY: Yes, he gave it all, the name and so on. We would like to offer in evidence the bulletin, and request permission to have it back when the case has been concluded. We would like to have it available to the Commission if they would like to look at it.

MR. UTZ: I have one more question.

RECROSS EXAMINATION

BY: MR. UTZ:

Q With reference to the Pennsylvanian completion on your Forest State "A" 1, can you say how much microlog pay you had in that zone?

A In the Pennsylvanian?

Q Yes, sir.

A We had fifty-two feet of net microlog porosity. May I -- Yes, fifty-two feet.

Q That's about twice as much as you had in the Wolfcamp, isn't it?

A Yes, sir, it is twice as much porosity, but the net

microlog porosity, but from the core analysis of the Pennsylvanian cores, the effective porosity is low, the permeability of the core is extremely low, and the residual oil saturation was low, very low, so that if you were left with a question of whether to complete this well or not strictly on the basis of the core analysis, I think we would have gone off and left it. I mean, just considering the Pennsylvanian and on our drill stem test to the zone, we didn't have nearly the spectacular results that the Penrose well in Section 34 had, or the Pure Well in Section 21, or even for that matter, the Sinclair well had, Sinclair No. 1 Seaman in Section 13.

MR. UTZ: Any other questions of the witness? The witness may be excused.

(Witness excused.)

MR. CHRISTY: Mr. Clark, please. Would you like to swear the remaining witnesses?

MR. COOLEY: Yes.

(Witnesses sworn.)

MR. CHRISTY: I would also like to offer in evidence this bulletin previously identified by the witness, with the request that we may have the article back when the case has been concluded.

MR. UTZ: What do you want to mark this one?

MR. CHRISTY: 3-F. Is 3-F admitted?

MR. UTZ: If there are no objections, it will be admitted.

RAY CLARK

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

DIRECT EXAMINATION

BY: MR. CHRISTY:

Q Will you state your name, address, and occupation?

A Ray Clark, 2103 Redbud, Odessa, Texas. I am petroleum engineer for Forest Oil Corporation in the Production Department, Odessa, Texas.

Q Have you ever testified before this body before?

A No, sir, I haven't.

Q Would you please give us a brief summary of your schooling and places of higher learning, when you graduated, what degrees you hold, and what occupations and duties you have done since graduation in the field of petroleum engineering.

A Yes, sir. I graduated from Texas A & M in 1952 with a bachelor of science degree in petroleum engineering and mechanical engineering. I have been employed by Union Producing Company, Cane Brothers Engineering Company, and Final Engineering Service Company in the capacity as engineer. I am presently employed by Forest Oil Corporation as a petroleum engineer and I am a registered professional engineer in the State of Texas.

Q Have you ever testified before any other regulatory bodies?

A No, sir.

Q Mr. Clark, the lands involved in this application are

in Section 26, Township 16 South, Range 33 East, NMPM, Lea County, New Mexico. Are you familiar with the wells in the general area of, in that general area, and specifically the subject well of this application?

A Yes, sir.

Q Production-wise?

A Yes, sir.

MR. CHRISTY: Does the Commission have any question concerning the witness' qualifications as a production engineer?

MR. UTZ: His qualifications are acceptable.

Q (By Mr. Christy) Mr. Clark, are you familiar with the method of completion of the subject well, and if so, would you give us please a brief study on that completion data?

A Yes, sir.

MR. CHRISTY: I would like to have this marked.

MR. UTZ: You wish this to be marked Applicant's Exhibit 4?

MR. CHRISTY: Yes, please.

Q (By Mr. Christy) Now, I hand you what has been marked Applicant's Exhibit 4 to assist you in answering the question just propounded. Will you continue, please.

A Yes, sir. Exhibit 4 is a schematic sketch of a dual completion of Forest Oil Corporation's No. 1 State "A" well that has previously been identified. 5 1/2 inch production casing has been set to a total depth of 11,592 feet. There were two zones perforated. The Wolfcamp zone was perforated between the intervals -- Do you want the specific perforations?

Q You can say, I think it will be sufficient to satisfy the Examiner, that the perforation data are shown on Exhibit No. 4 without reading all those figures.

MR. UTZ: That's satisfactory.

A The perforations are stipulated on Exhibit 4 and they are correct. A single string of 2 3/8 OD 4.70 EUE production tubing was run in the well for production purposes. It was landed on a Baker Model "D" Production Packer, which was set by wire line at 11,410 feet to separate the two zones of production. Immediately above the production packer we have a P. S. I. Model "C-2" landing nipple with a "CVE" separation sleeve, commonly referred to as straight through sleeve in place. A sleeve of that particular type allows Pennsylvania production from below the packer to move upwards through the tubing to the surface, but doesn't allow it to get into the annular spaces.

Q Now, you are proposing producing the Pennsylvanian from the tubing and the Wolfcamp from the annulus, is that what you are proposing?

A Yes, sir, that's the way we propose it.

Q Go ahead.

A Immediately above the S. P. I landing nipple that was pointed out, we have a Baker Model "C" Tubing receptacle which is in effect a small tubing packer, but it does not pack off against the casing wall itself. It is strictly a tool which is run in in order to facilitate future possible remedial work.

Q I believe that answers the question. Have production tests been run on the two zones shown in Exhibit 4?

A Yes, sir, they have.

Q Do you have any results of those production tests?

A Yes, sir, Exhibit 5.

Q Would you give us your production test reports on the Wolfcamp first, please, sir.

A Yes, sir. The Wolfcamp, on January 20, 1958, following a clean up period, after the well was acidized, after the Wolfcamp portion was acidized, the well flowed through the casing and flowed approximately 97 barrels of fluid that was approximately 25 percent acid water, fresh water. In three hours, on a half inch choke, flowing casing pressure was 300 pounds, gas-oil ratio was 988 to 1. Gravity of the oil was 40.3 degrees API corrected, and the cumulative total of the Wolfcamp oil which we have stored at the surface or sold to date, everything that has been taken out of the Wolfcamp zone, was a total of 704 barrels of oil.

Q Would you give us similar production tests on the Pennsylvanian, or Seaman zone?

A Yes, sir. In the Pennsylvanian, on January 27, 1958, we potentialled the Pennsylvanian zone, and it flowed through the tubing 325 barrels of oil and no water in 24 hours on a 15/64 choke. Flowing tubing pressure was 850 pounds. Gas-oil ratio was 1349 to 1. The gravity of oil was 41.5 degrees API corrected. There are subsequent production tests shown on this Exhibit 5.

Q Now, on Exhibit 5 you show future production tests between February 1, 1958, and February 23, 1958. Are the matters therein correct? A Yes, sir, they are.

Q Now, what zones do they relate to?

A Everything from January 27th, 1958 forward represents solely Pennsylvanian production.

Q So you have one report on the Wolfcamp in the first paragraph, and the balance of the exhibit relates to Pennsylvanian?

A That's correct.

Q Now, do you have a well history on the subject well?

A Yes, sir, a brief history. It does not go into deep details, but it shows all important operations on the well from the time that it was spudded up until the present time, and I'll have to ask that the last entry on that history be stricken from the record. It is that we have not decided to run that test, but we have simply decided to postpond the test for a while.

Q Now, Mr. Clark, as I understand you, the last line on Applicant's Exhibit 6 should be stricken for the reason that that test has not yet been run? A That's correct.

Q Now, I refer you to the pressure figures shown at Page 1 of that Exhibit on January 17, and various other pressures, are those accurate pressure measurements?

A The pressures which were actually measured by the instrument were accurate, but these are field readings of the chart that resulted from those instruments, and field readings, necessarily

out on a rig, you are going to have a little air involved. You are not reading your pressure with a scanner, you are doing it just with a ruler, to get a close approximation.

Q So that the pressures shown on the exhibit are merely approximations? A That's right.

Q And you are not contending they are exactly --

A That's right.

Q Now, I refer you to Exhibit 1, which has previously been admitted. Does Exhibit 1 show the location of the well involved in this application and the leases in the general vicinity surrounding it? A Yes, sir.

Q Now --

A Exhibit 1 shows the location of the well involved in the application and location of the wells on offset leases, and in the general area, the lease embracing the subject well covers only Section 26, Township 16 South, Range 33 East.

Q Would you locate the subject well for us by legal description and distances from the North and East line?

A Yes, sir. It is 660 feet from the North and East lines of Section 26, Township 16 South, Range 33 East, NMPM, Lea County, New Mexico.

Q Now, do you have some data on your casing and cementing program in connection with this well? Is that matter shown on Exhibit 6?

A All casing and cementing that took place on the well

is shown in detail on Exhibit 6.

Q And that is accurate data?

A Yes, sir, that is the accurate data.

Q Now, do you feel there is possiblity of communication or migration of fluids between this Kemnitz Wolfcamp and the Seaman Pennsylvanian zones in the annulus of the casing?

A No, sir.

Q Were any fresh water zones encountered in your drilling activities, and if so, were they cemented off and protected?

A I presume that we did encounter some fresh water zones above the red beds.

Q Would you rather defer that question?

A That is generally normal, and we set our surface casing down into the red beds and circulated cement back into the surface.

Q All the way from the surface into the red beds?

A Yes, sir.

Q And that is solid cement there?

A Yes, sir.

Q Now, on the proposed dual completion, are you familar with the proposed type of installation and so on, on that packer, and all of those which you previously mentioned?

A Yes, sir.

Q Is that, in your opinion, in accordance with good engineering practices and principals, that method of dual completion?

A Yes, sir.

Q Is the proposed dual completion installation which you mentioned, one of the standard types used in the oil industry?

A Yes, sir, it is.

Q Has the proposed type of dual completion operation proved successful in operations in actual field tests?

A Yes, sir.

Q As to your surface equipment, can it be designed and installed so that the reservoir will be separately produced and their fluids separately tanked and gauged for no commingling?

A Yes, sir. In the event a dual completion is allowed, we will set additional tankage and separators so there will be no surface commingling of oil.

Q Is the dual completion requested in the application, which you previously mentioned, recognized and accepted by, in general, by the oil industry and other regulatory bodies?

A Yes, sir.

Q How about corrosion, could that present a problem?

A No, sir, not in the subject well, it should not. We have a report from Gulf Pipeline on two wells, the Kemnitz "A" 1 -- Tennessee-Kemnitz 1 "A" and the Sinclair Seaman No. 1, and the sulfur content on both of those wells was on the order of one tenth of one per cent. Sweet crude is generally defined as being less than one per cent sulfur content.

Q Is the crude from these two producing zones sweet or sour?

A It is sweet.

Q Do you feel that the dual completion technique provides any more possiblity for leakage or communication between the two reservoirs than any other system that you might know of?

A No. As a matter of fact, it probably has less possibility for communication or leakage due to the lesser number of joints involved in only having one string of tubing.

Q Have you taken packer leakage tests on the well?

A Yes, sir.

Q Do you have any data in connection with that?

A I have.

Q Now, I refer you to Applicant's Exhibit 7 and I will ask you whether or not that reflects your packer leakage tests and the results of same, and gives diagrammatic sketchs of the graph, and I believe also there is attached a plot of packer leakage test pressures? A Yes, sir.

Q Is that what Exhibit 7 is?

A Yes, sir. I might add that this packer leakage test was run on January the 25th, and was run primarily for the benefit of Forest Oil Corporation. It was run in accordance with the rules of the New Mexico Oil Conservation Commission, and notification was given that the packer leakage test would be run. We desired to run this packer leakage test prior to the time when it might be necessary. We wanted to run the thing before we started trying to evaluate our reservoirs. That would have been

done with bottom hole pressure recording instruments. We wanted to satisfy ourselves beyond any shadow of a doubt that we would be evaluating solely the one reservoir in which we were attempting to gain data.

Q Now, mechanically speaking, can separate maintenance pressure tests be run on the two zones under your proposed type of dualing, and if so, how?

A Yes, we can run, I presume you are referring to subsurface pressures, bottom hole pressures?

Q Yes, subsurface pressures, bottom hole pressures tests.

A Yes, sir, that is very easily accomplished with wire line manipulation of subsurface tools. The tools on Exhibit 4, the P. S. I. Model "C2" landing nipple, which is shown immediately above the production packer has side doors in it, with straight through sleeve installed, as we presently have it in order to produce the Pennsylvanian. The Pennsylvanian reservoir is the only one which is open to the inside of the tubing, and naturally, we can run bottom hole pressure tests, or any flowing tests through the tubing right straight up the tubing through the receptacle sleeve in the event you want to gain data on the Wolfcamp zone. All that is necessary to do is to go in with wire line tools and retrieve the straight through sleeve, which was mentioned, this separation sleeve, you retrieve that, and go back in with a second sleeve, which is referred to generally as a bottom-black or side door tool. That tool, when latched into place contains the zone

below the packer; in this case, the Pennsylvanian zone. The tool contains that zone below the tool and below the packer, then the Wolfcamp zone is opened to the inner portion of the tubing through the side door ports in the P. S. I. landing nipple. Now, if you were going to use a bomb to get a subsurface pressure in your tubing there, you would flow a little in excess of tubing capacity to your tanks in order to be sure that you have a Wolfcamp gradient oil in your tubing rather than Pennsylvanian gradient in your tubing, then you would proceed just as though the tubing were suspended free and the bottom of the hole in the packer itself.

Q Is this a permanent type packer?

A Yes, sir, it has to be drilled out.

Q What is the cost of drilling a Wolfcamp well using this 5 1/2 inch casing?

A A Wolfcamp well?

Q Yes, sir.

A Two hundred sixteen thousand dollars, approximately.

Q What would it cost to drill a Pennsylvanian well and dual complete it with 5 1/2 inch casing in a single tube and complete it in the Wolfcamp and Pennsylvanian, using 5 1/2 inch casing in the single tubing?

A Two hundred and forty-eight thousand dollars.

Q What would it cost to drill a Pennsylvanian and dual complete it using 7 inch casing and two strings of 2 3/8 inch tubing?

A Two hundred eighty thousand.

Q Now, how much would it cost just to drill a straight well to the Pennsylvanian skipping the Wolfcamp, so to speak, with 5 1/2 inch casing, or whatever would be used?

A About two hundred and forty thousand dollars.

Q Now, in your 5 1/2 inch tubing that you presently have in there, can you put in another string of 2 3/8 inch tubing?

A No, sir, it is physically impossible.

Q Could you go back now and make a 7 inch casing out of your present well? A No, sir.

Q Why not?

A You have already got 5 1/2 inch casing in that hole, and it would be much cheaper, if you desired to do that, it would be much cheaper to skip over a little ways and drill yourself a new hole.

Q It is economically --

A It is physically impossible.

Q It is physically impossible?

A Frankly, I think it is physically impossible to do it and stay in the same hole.

Q Are you familiar with the Wolfcamp formation in the general area of the well? A Yes, sir.

Q Is it a continuous reservoir or pool?

A Yes, sir.

Q Based on that, have you arrived at any opinion as to

whether or not the subject well may be presently being drained in the Wolfcamp?

A Yes, sir, I think it is fairly obvious that the subject well is being drained by the Kemnitz Wolfcamp producing field to the east of the subject well, being drained by that area in general, and particularly, it is being drained by the Tennessee State Kemnitz "B" well.

Q That's in Section 25?

A Yes.

MR. CHRISTY: That's all.

MR. UTZ: Let's take about a ten or fifteen minute recess.

(Recess)

MR. UTZ: The hearing will come to order, and you may proceed with Mr. Clark.

MR. CHRISTY: Mr. Examiner, we have attempted, from the first witness, to elicit the geological problems involved in the area, and from this witness we tried to elicit the mechanics of the dual completion and the production matters of the subject well. Our third witness will consider the well history and reservoir estimates, the other producing wells in the area, and the economic factors and the actual specific reasons why we request this application. It is obvious from the testimony to date, up to this point that, I believe, we do claim we are being drained in the Wolfcamp. We do not make such a claim in the Pennsylvanian,

but we propose to show why the application should be granted from the third witness on the economics and on the well history and the reservoir estimates, and so forth. We will go into that with the third witness, but we do not have any other questions from this witness with regard to the mechanics of completion and the tests taken on the subject well itself, and the production.

MR. UTZ: Is there any questions of Mr. Clark. Mr. Cooley.

CROSS EXAMINATION

BY: MR. COOLEY:

Q Mr. Clark, you stated on direct that the proposed method of oil-oil dual completion flowing in the upper zone through the tubing annulus, and lower zone through tubing is a standard practice in the industry and accepted by the industry as well as several conservation bodies throughout the country?

A Yes, sir.

Q Could you enumerate what states authorized this type of dual completion, to your knowledge?

A To my knowledge, they are authorized in Mississippi, Louisiana, and Texas.

Q And do you have any knowledge of any such dual completion having been approved in the State of New Mexico?

A No, sir.

Q Do you know whether any such applications have ever been made

A No, sir, I am not aware of that.

Q Mr. Clark, in the event this application were denied, what would be the alternative left for Forest Oil Corporation as regards to these two zones and their existing wells?

A I think the only thing we could do would be, to prevent drainage in the Wolfcamp, I think we would have to eliminate our Pennsylvanian production.

Q And you do not, I believe, from the outline Mr. Christy gave us, you are not prepared to testify on the oil in place in the Wolfcamp? A No, sir.

MR. CHRISTY: We have a reservoir engineer who will do that.

MR. COOLEY: That's all the questions I have.

MR. UTZ: Any other questions of the witness?

QUESTIONS BY MR. UTZ:

Q Mr. Clark, I believe you stated that 5 1/2 inch casing completion to the Wolfcamp was two hundred sixteen thousand dollars, and proposed dual completion is two hundred forty-eight thousand dollars, and if you were to put 7 inch casing, and two, 2 3/8 inch strings, it would be two hundred eighty thousand dollars, is that correct? A Yes, sir, that is correct.

Q Obviously the reason you can't put in two, 2 3/8 inch strings is because you have 5 1/2 inch casing in the hole. Now, is there any other type of tubing that you could use two strings on?

A Yes, sir. You could run two strings of inch and a half paraffin joint, or Hydrill, either one, those both fit in 5 1/2 inch casing, or you could run one string of 2 3/8 inch casing and 1 inch string. That can be done physically.

Q Could you use two strings of 2 1/16 Hydrill?

A I am not sure right offhand whether you could or not, I would have to check clearances on that. We have some twenty pound pipe in this hole.

Q Is the Hydrill tubing more expensive than the regular EUE?

A Appreciably so.

Q It is?

A Measurably so, yes. Your tubing is your primary cost factor when you start talking about Hydrill. The pipe itself is a relative insignificant figure, as compared to the cost of tubing.

Q Are you in a position to say whether or not you intended to drill to the Pennsylvanian when you projected this well?

A We did not.

Q What caused you to go ahead to the Pennsylvanian?

A We were a little dubious about the prospects of a Wolfcamp producer when we ran drill stem tests in the Wolfcamp. We were afriad we may have a dry hole. We went on to the Pennsylvanian in order to use it as a salvage operation in the event that the

Wolfcamp did not produce.

Q Now, you are drilling another well, I believe?

A Yes, sir.

Q Offsetting this one to the south?

A That's correct.

MR. CHRISTY: It is the No. 2 well, Mr. Examiner, it is shown on Applicant's Exhibit 3.

Q Is that well now dry? A Yes, sir, it is.

Q Have you projected it to the Pennsylvanian?

A No, sir, it is now projected currently as a Wolfcamp well. If I remember correctly, our application to drill the well included a depth of ten thousand eight hundred feet, that would put us in the Wolfcamp.

Q How far along is this well drilled now?

A It is at approximately four thousand feet.

Q And what type of casing do you intend to use there?

A Five and a half inch casing.

Q Might you not be in the same position when you get to the Wolfcamp on this well?

A It is possible, yes, sir.

Q Still, in view of the fact that you had the Pennsylvanian in your No. 1 well, you still don't intend to go to the Pennsylvanian in your No. 2 well?

A No, sir, we don't. Not under our present plans, we don't.

Q If your Wolfcamp is dry, you are going to plug it?

A Well, that is a decision that will have to be made at that time.

MR. UTZ: Any other questions of the witness? Mr. Nutter.

QUESTIONS BY MR. NUTTER:

Q Mr. Clark, to get into the mechanics of flow in a flowing well, what is the principal propelling agent that moves the oil up the tubing or up the casing of the tubing annulus, as the case may be?

A Decompression of the reservoir oil and expansion of the gas in solution in addition to a driving force possibly of the expanding gas cap, if there happens to be one.

Q And you have this gas coming out in solution in the casing or tubing annulus? A That's correct.

Q As free gas?

A In conjunction with the oil that it is bringing with it. It is the piston or the driving force.

Q What is the diameter of the pipe that you have in this hole, internal diameter?

A It is about 4.9 inches.

Q Now, in response to a question by Mr. Utz a moment ago, you said it was impossible to run two 2 1/16 inch K.S. joint strings, parallel strings of this type of tubing.

A I stipulated it might be impossible. I do not know

whether it is possible to run two strings of 2 1/16 inch Hydrill.

Q Do you know what the OD of the joint is on 2 1/16 inch Hydrill tubing string?

A Right offhand I don't.

Q Assuming that it were 2.33 inches, would it be possible to run parallel strings in this --

A Yes, it would.

Q What type of tubing do you usually run in accordance with the application?

A 2 3/8 inch OD, No. 4.70 EUE N80 tubing.

Q What is the outside diameter of that?

A 2 3/8 inches. The coupling diameter is 2 1/2.

Q The tubing --

A 2 3/8 nominal.

Q Do you have any idea of what the cross-sectional area of 2 3/8 inch OD tubing is?

A The cross-sectional area?

Q Yes, sir.

A Of the tubing itself?

Q Yes, sir. If you have it, would you figure that for us, please.

A All right, sir. Approximately 4 1/2 inches, square inches.

Q What would the cross-sectional area of your 5 1/2 inch casing be? That is, the internal cross-sectional area?

A Approximately 18.9 square inches.

Q What would be the area of the annulur space, the difference between the outside area of the tubing and the inside area of the casing?

A I don't recall what -- What did I give?

MR. UTZ: 4 1/2.

A That would be 14.4 square inches.

Q How would the cross-sectional area of this annulur space compare with the cross-sectional area of the two and a half inch spacing?

A It would be roughly five times as large.

Q Five times?

A I think that's right. Approximately five times as large.

Q Now, Mr. Clark, you stated that one of the driving forces to cause this fluid to move up the well bore was the expansion of gas coming out in solution? A Yes.

Q As that gas comes out in solution, it has to move a certain amount of fluid that is in the pipe, is that not true?

A That's right.

Q The amount of slippage that is encountered as this gas moves through the column of oil would be a function of the velocity with which the fluid was moving, would it not?

A Yes, sir, that would be one of the dependents.

Q Do you think that the velocity of fluid would be

comparable in an inverse sense to the cross-sectional area? That is, to move a certain volume of fluid through a given cross-sectional diameter, the velocity of the fluid would be inversely proportionate to the cross-sectional diameter?

A That's correct.

Q And the velocity of this fluid coming up this annular space would be 1/5 as much as the velocity of the fluid coming up the string of tubing?

A Approximately, yes.

Q Now, would you have five times as much slippage in that event?

A I don't think so.

Q How much slippage would you have?

A I think you would have on the order of two to three times as much slippage.

Q You would increase the slippage --

A Yes, sir.

Q Then the increase of slippage is the dissipation of energy, is it not? A Yes, sir.

Q As you increase this cross-sectional area and permit more of this gas to come through the oil by slowing down the velocity of the fluid, would you have a tendency to increase the gas that is produced from a reservoir?

A Would you state that over again, please.

Q In other words, do you agree with the concept which is

frequently asserted in the oil industry that the tubing of wells results in a lower gas-oil ratio for those wells?

A Yes, I think that is definitely correct.

Q Do you think that decreasing the cross-sectional area by a matter of 1/5 would have any affect on the gas-oil ratio?

A Yes.

Q Do you agree with the testimony of Mr. Dehlinger that these are rather high oil ratio, or may be expected to be high oil ratios in this area?

A Yes, I do.

Q Do you think that's in the interest of conservation, to increase the gas-oil ratio?

A No, I don't, not when you are starving for gas. I think it is a function of whether or not you are going to add the depletion of the oil portion of a reservoir, whether or not you will still have gas left.

Q What utilization is being made of the gas that is being produced here now?

A There is none at the present. There is no pipe outlet for this gas. There should be before summer.

Q What disposition is being made of it at the present?

A It is being flared. We are talking about any gas?

Q Gas in this pool, yes, sir.

A In the Kemnitz Wolfcamp pool?

Q Yes, sir.

A It is being flared. I presume that it is, there is no pipeline outlet in the vicinity that I know of.

Q What reason do you have to think that the gas slippage would be a matter of two or three times as great?

A You have a reduced friction factor, for one thing.

Q Reduced friction factor as a result of having more annular spaces?

A Yes, sir, I think so. You will have a lower velocity, and in all probability, you will have a laminar flow as opposed to turbulent flow in the tubing. I don't mean to imply that that necessarily will be the case. You don't necessarily have turbulent flow within your tubing if you are producing at the same rate that you are producing in the annular, but it may very well apply, and even if it does not, your friction factor increases with an increase in velocity.

Q Do you think that you will have a laminar flow in the application of the tubing annulus with that flow bumping into the collars all the way up the hole?

A Yes, I think the type of flow that you have is going to be a function of velocity.

Q And you would expect a laminar flow even with these high gas-oil ratio that may be encountered in the Wolfcamp?

A Possibly not in the very top of your string, say two thousand feet from the surface, from there up I wouldn't expect definitely to have laminar flow, but I would expect to have

laminar flow in the lower reaches of the annular reach.

Q Where the velocities are slow?

A Yes. As the velocity increases with expansion, and gas comes out in solution, why you may very well get into a turbulent flow situation. At that point your velocity may become great enough to give rise to turbulent flow.

Q Mr. Clark, do you think that the ideal stringer and tubing that could be installed in the well would be one which would balance the friction losses and the slippage losses so as to achieve a minimum drop in pressure as the fluid moves up the hole?

A Yes, I believe that's correct.

Q And do you think that the annulus between a stringer of two, 2 3/8 inch tubing and 5 1/2 inch casing achieves that minimum pressure drop?

A No, it doesn't. It is not the ideal. I think you have to strike a balance between the cross-sectional area that you are producing and the amount of friction drop that you get due to your frictional resistance to flow, which would, of course, be based on your hydroelectric radius.

Q Do you think that the friction drop which would be encountered in annular flow or concentric flow, as it might be called, is the same friction drop that you would have in a round pipe of the same cross-sectional area?

A No.

Q Would it be greater?

A It would be greater because you have two, you have a greater hydroelectric radius.

Q You have two surfaces? A Yes.

Q To cause friction? A That's right.

Q Mr. Clark, how long do you think that the Pennsylvanian zone will continue to flow at the present rate of decline?

A I don't believe I am prepared to answer that question.

Q Do you anticipate a long flowing life in the Pennsylvanian zone?

A By long are we including the term, years? If we are talking in terms of years, I don't anticipate that long.

Q Would you anticipate it would continue to flow for several months?

A I don't think that it will be flowing six months from now.

Q I notice on your diagrammatic sketch that you have indicated that the tail pipe at least would be an inch and a quarter OD Kobe tubing. What is the reason for that?

A We ordinarily run something small below, or seal nipples in order to avoid having any of our wire line tools being lost and going on down, so that we don't even have any fishing jobs below, and we don't have to go below our permanent packer with wire line tools.

Q Then this piece of tubing is in the nature of a

restriction on the bottom of the tubing rather than an indication of putting in Kobe pumping equipment?

A No, sir, that is not for Kobe pumping equipment at all.

Q What has been the general characteristics of the wells in the Kemnitz Wolfcamp pool? How many wells are in that pool total, do you know?

A I do not.

Q Well, just answer the question this way, what percentage of the wells, to your knowledge, are flowing, and what percentage have had to go on pump?

A It is my understanding that two of the wells have gone on the pump in the Kemnitz Wolfcamp pool.

Q And the balance are flowing?

A The balance of the wells, as far as I know, are flowing.

Q Now, a summary of the wells that have been completed in the Pennsylvanian zone shows that the Penrose well is such that it can hardly be termed a well at this time. Now, what about the Sinclair well, is it a flowing well or pumping well?

A It is a flowing well.

Q What about the Pure well, what is its status?

A It is flowing.

MR. NUTTER: I believe that's all.

MR. UTZ: Any other questions of the witness?

MR. CHRISTY: I have one or two here.

REDIRECT EXAMINATION

BY: MR. CHRISTY:

Q Mr. Clark, a question was asked on raising this gas-oil ratio. Do you plan to utilize the gas as it is taken out as soon as the pipeline facilities are available?

A Yes, sir. We anticipate that our gas will be taken by the gasoline plant or the completion plant which is presently being built about three miles east of us.

Q Now, do you feel that the increase in the gas-oil ratio will endanger the reservoir and the ultimate recovery in the Kemnitz pool?

A No, sir, I don't. I think they are going to end up with excess gas in their land.

Q So that the increase in gas-oil ratio will not be detrimental to the pool? A No, sir.

Q Coupled with the fact that you will be able to utilize the gas?

A I think that's correct.

Q Now, sir, a question was asked you whether or not you could use Hydrill tubing. Did your cost estimate previously made include the use of Hydrill tubing?

A It included the cost of a stringer of one inch Hydrill tubing to be run down. It is possible to run that down beside the present string of producing tubing that is in, and 5 1/2 inch casing. We could possibly, physically run a string of Hydrill.

Q If you had completed it with the use of Hydrill tubing, wouldn't your cost have been increased from that previously testified?

A Yes.

Q Substantially, or minor?

A Well, if you are going to compare it with anticipated Pennsylvanian production, as I understand it, I think it is quite a substantial figure.

Q Do you know what that figure might be, that increase?

A I estimate it, to run a string of one inch Hydril tubing to ten thousand seven hundred feet, the estimated cost of the tubing, the equipment and installation expense, all included, would be seventeen thousand dollars. That's over and above the cost that we have in the well now.

Q Now, mechanically speaking, can either one or both of the pay zones be pumped under your present form of completion?

A Yes, sir, either zone can be pumped with the other zone shut in. The Pennsylvanian zone can be pumped up the tubing with the Wolfcamp flowing up the casing annulus.

Q Supposing you had to put the Wolfcamp on a pump.

A Block off the Pennsylvanian and pump solely the Wolfcamp, unless you are going into dual completion zone pumping equipment.

MR. CHRISTY: That is all the questions I have.

RECROSS EXAMINATION

BY: MR. NUTTER:

Q That raises one question, Mr. Clark. You stated that it would cost you seventeen thousand dollars to run a string or two strings?

A One string.

Q One string of C.S. joint?

A That's right, C. S. Hydrill.

Q Now, you were including there the cost of running the pipe as well as buying?

A That's right, buying the pipe. The pipe itself -- Ten thousand seven hundred feet of that pipe would cost fourteen thousand five hundred dollars.

Q A large part of that is capital investment, which could be recovered after the well is completed?

A It may very well be recovered from a weight standpoint, but I don't know whether we would ever use it again, and when you get something like that in your hands, in your yard, you end up selling it for junk, and you get a junk price for it.

Q Another thing, Mr. Clark, you stated that it would be physically impossible, in your opinion, to run 7 inch pipe in this well at the present time? A Yes, sir.

Q Now, would it have been physically impossible to run 7 inch pipe in the well prior to the time the 5 1/2 inch pipe was run?

A We did not have a hole large enough drilled to accommodate

7 inch pipe. That hole would have had to be rimmed.

Q Couldn't it have been rimmed under the five --

A No, sir, you would have to go back to your surface casing. We had 8 5/8 in the hole, you can't run 7 inch casing in that. We would have to set 9 5/8 inch in lieu of 8 5/8 if we wanted, anticipated running 7 inch casing. That is our normal program.

Q It is physically impossible to run 7 inch pipe inside 8 5/8?

A Right offhand I don't know whether it is physically impossible or not, but it is not in good practice. You are taking too much of a chance. If you have any clearance, you have so little clearance that a slightly crooked hole would get you stuck and you would end up junking the hole right there.

Q You don't think it would be met with success in any event?

A I don't think that you would go into a situation like that intentionally. I don't think that you would intentionally set out to have an 8 5/8 intermediate string and run a 7 inch casing inside.

Q What do you mean intentionally?

A That's what I mean.

Q When the well was originally contemplated, you mean?

A Yes, sir.

Q But as a salvage operation, do you think it would be

attempted?

A I would have to find out whether or not it is even physically possible to run 7 inch casing inside 8 5/8. I don't know that right offhand.

MR. NUTTER: Thank you.

MR. UTZ: Any other questions of the witness?

QUESTIONS BY MR. STAMETS:

Q Mr. Clark, I have one question. About how much oil do you expect to get from the Pennsylvanian zone?

A That is going to come from the Reservoir Department, if you don't mind.

Mr. STAMETS: That is all.

MR. CHRISTY: I have some questions.

REDIRECT EXAMINATION

BY: MR. CHRISTY:

Q The question came up whether or not when you got to the Wolfcamp you could have rimmed out the hole?

A Yes, sir. It is physically impossible.

Q It is physically impossible. How about the cost factor on that?

A In hard rock country like this, I think that you are probably a little better off if you just go back and start over.

Q In other words, it is probably going to be cheaper to drill a new well, new hole?

A That's right. Your bits go out of gauge too fast.

MR. CHRISTY: That's all the questions I have.

(Witness excused.)

MR. CHRISTY: For the Commission's consideration, a question was made about one and a half inch tubing, using two sets of that. I will refer to Case 1365, Order No. 4-1126, in which this body found:

"That the use of 1 1/2 inch diameter tubing in the proposed dual completion would impair the flow efficiency of both producing horizons, thereby necessitating the premature use of artificial life equipment."

Our last witness is Mr. Parsley, the reservoir engineer who will sum this up.

JOE M. PARSLEY

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

DIRECT EXAMINATION

BY: MR. CHRISTY:

Q Would you please state your name, address, and occupation?

A Joe M. Parsley, 1200 Chestnut Lane, Midland, Texas. I am a reservoir engineer for Forest Oil Corporation in the Midland office.

Q Have you testified before this body before?

A No.

Q Will you please give us a brief history of your higher education, your degrees, when and what you have done since then in the way of petroleum engineering, or related subjects.

A I graduated from the Universtity of Texas with a bachelor of science degree in petroleum engineering in 1951. I have worked for the Ohio Oil Company and Forest Oil Corporation six years as a reservoir engineer, and one year in the field. I am a registered professional engineer in the State of Texas.

Q Have you ever testified before any other regulatory bodies?

A No.

Q The lands involved in this application are situated in Section 26, Township 16 South, Range 33 East, NMPM, Lea County New Mexico, involving Forest Oil Company's No. 1 State "A" Well. Are you familiar with that well, or the general wells in the vicinity of that area?

A Yes, sir.

MR. CHRISTY: Does the Commission have any questions concerning the witness' qualifications?

MR. UTZ: No. His qualifications are acceptable.

Q Now, sir, I will refer you to Applicant's Exhibit 3 which has previously been testified as showing the wells drilled and producing in the Seaman Pennsylvanian formation. Now, will you give us a little well history and reservoir estimate on the subject well in Section 26?

A Yes, sir. That well was potentialled from the Pennsylvanian for three hundred and twenty-five barrels of oil per day. 15/64 inch choke. Flowing tubing pressure of eight hundred fifty pounds. A gas-oil ratio of thirteen hundred and forty-nine. A gravity of forty-one point five degrees API. Completed, January 21, 1958, after one hundred gallons of mud acidized, and two thousand gallons of regular acid.

First, we have examined the rock proporties. The microlog shows forty-seven feet of pay in the principal zone, with a five foot zone immediately above it. Core analysis in the Pennsylvanian shows forty-seven feet of pay. The average porosity by core analysis is eight point six percent. We do not have the fluid analysis of the Pennsylvanian oil. However, we have made some estimates, comparisons based on a gas-oil ratio, flowing gas-oil ratio of thirteen forty-nine. We have assumed that to be the solution gas-oil ratio. From this we have estimated a saturation point, a bubble point of thirteen hundred pounds. Estimated compressibility of the Pennsylvanian oil above the bubble point is in the order of seventeen times ten to the minus six barrels per PSI, and a

gravity of forty-one point five degrees API.

We have access to three reservoir pressures. Our first one was obtained through a drill stem test. The initial shutin pressure of our first drill stem test in the Pennsylvanian, before any oil was produced, the pressure was forty-one seventy-two. After the well had produced four hundred and ninety-eight barrels of oil, we measured the pressure with a bomb to be thirty-four eighty-four. A little later on we took some PI tests on the well and using these tests, we have calculated a reservoir pressure at that time, that calculation to be twenty-eight ninty-six, at which time thirty-nine hundred and seventy-six barrels of oil had been produced.

We have used this pressure information to calculate a reserve for the Pennsylvanian. As you can see, we have two pressures that have been measured above the bubble point, pressures of thirty-one hundred pounds. This can be used to calculate the oil in place during the fluid expansion phase of production. We have experienced six hundred eighty-eight pound pressure drop while four hundred ninty-eight barrels of oil were produced. This gives us a point seven two four barrels of production for PSI pressure drop in the reservoir --

MR. NUTTER: How much was that?

A Point seven two four. Applying the compressibility factor of seventeen times ten to the minus six to this figure of

point seven two four would determine that there were forty-two thousand six hundred barrels of oil originally in place, stock tank oil.

The recovery to the saturation pressure of thirty-one hundred pounds is estimated to be seven hundred and seventy-five barrels. That is calculated by applying a one thousand seventy-two pound pressure drop from original saturation to this point seven two four barrels per PSI that we have experienced. Therefore, deducting the seven hundred and seventy-five barrels produced to saturation pressure from our forty-two thousand six hundred barrels of stock tank oil originally in place, we determined that forty-one thousand eight hundred twenty-five barrels of oil are in place when we hit the bubble point. These pressures indicate to us that we have a solution gas drive recovery mechanism. The recovery of oil in place of that type drive is in the order of twenty percent, therefore, multiplying twenty percent times the forty-one thousand eight hundred twenty-five barrels gives us a recovery, during solution gas drive, a recovery of eighty-three hundred sixty-five barrels of stock tank oil. Therefore, out total estimated recovery will be eighty-three hundred and eighty-five barrels, plus seven hundred and seventy-five barrels, or ninety-one hundred forty barrels of stock tank oil, or approximately ten thousand barrels of oil from the Pennsylvanian.

Q Have you figured those barrels using a dollar value?

A Using a gross reserve of ten thousand barrels of oil

to determine the working interest share of that, we multiply ten thousand by seven-eights to get eighty-seven hundred and fifty barrels of oil to the working interest. The posted price of oil is three dollars and eight cents a barrel. From this we must deduct twenty-two cents per barrel advalorem production tax. We have estimated our lifting cost to be in the order of twenty-five cents a barrel, that gives us the working interest and net income of two dollars sixty-one cents a barrel. The total income will be two dollars and sixty-one cents per barrel times eighty-seven hundred and fifty percent, or twenty-two thousand eight hundred thirty-eight dollars. That is the value of the Pennsylvanian oil in this well.

Q Now, this method you have described in determining the apparent reservoir in the Pennsylvanian area, is that a usual and common method used by reservoir engineers in making such evaluations? A Yes, it is.

Q Are you familiar with the production history in the Seaman Pennsylvanian, wells in the immediate vicinity of the subject well? A Yes, sir, I am.

Q Would you give us a brief history of these wells? Let's start with the Penrose well in Section 34.

A The Penrose "PG" State No. 1 was completed October 17, 1947 for an initial potential, flowing one thousand fifty-six barrels of oil per day, with a gas-oil ratio of a thousand and thirty-seven. gravity forty-two degrees.

Q Did you give the GO?

A Yes. A drill stem test was taken in this well prior to completion, which gave a shutin pressure of approximately six thousand pounds. In December of 1957, bottom hole pressure test and PI test were run on this well. The pressure measured with a bomb at that time was twenty-three hundred and forty pounds.

Q Has there been a severe decrease in pressure in the Penrose?

A Yes. The Penrose well has, through December '57, made only ninety-three hundred and forty-seven of oil. During that time, the well has been reperforated to open all the zone that it had available, reacidized, and the well failed to produce the allowable, and at times got down to only twelve to twenty barrels a day. As has been stated, they have recently sand off the frac with fifty thousand gallons. This well also experienced an increase in gas-oil ratio from completion. The completion ratio was a thousand and thirty-seven. During the PI test, a ratio rise of three thousand and twenty-nine was measured. The well makes no water.

Q Now, I refer you to the Seaman unit well, which is in Section 13. Will you give us a brief production history of that well?

A The Sinclair Seaman unit No. 1 well was completed October 1st, 1956 for an initial potential, flowing six hundred and twelve barrels of oil per day, plus twenty-four barrels of

water, with a GO of nineteen seventy-nine, and gravity of forty-two point seven. An original drill stem test was run on this well before completion. The measured pressure was thirty-nine hundred and thirty pounds after two hours and fifteen minutes shutin. Another pressure was run on this well in April, 1957. The extrapolated reservoir pressure, built-up pressure, was thirty-three hundred and nineteen pounds. The water reported on initial potential had dried up after three montns of production. The gas-oil ratio reported now is approximately a thousand. The well has accumulated, through December 1957, approximately eighty-six thousand barrels of oil.

Q Has there been severe drops in that well?

A Not as severe as on the Pennsylvanian.

Q In the vernacular, I believe, that is considered a good well?

A Yes.

Q Tell us a little about the production history of the Pure well in Section 2 of Township 21.

A The Pure State Lee "E" No. 1 was completed October the 26th, 1957, for an initial potential, flowing fourteen hundred and forty barrels of oil per day. The gas-oil ratio was thirteen hundred and fifty. Gravity, forty-four degrees. This well, on a drill stem test prior to completion, the reservoir pressure was measured to be seventy-two hundred pounds per square inch. A bottom hole pressure test with a bomb was run in November, early part of November 1957, and it measured to be sixty-nine

hundred and eleven pounds. No other bottom hole pressure tests have been run, however, the well has experienced quite a drop in flowing pressure, flowing tubing pressure. The well, after completion, would produce its allowable with a flowing tubing pressure of thirty-eight hundred pounds. Tests thereafter show the tubing pressure, the well making approximately its allowable drops to fifteen hundred, twelve hundred and twenty-five, eighteen hundred and seventy-five, and on the last report we had, the well made approximately its allowable, with a flowing tubing pressure of seven hundred and sixty pounds, indicating a depletion of --

Q Evidencing severe pressure drops on the Pure well?

A Right.

Q Do you have the figures on the total amount of oil produced?

A The Pure well has accumulated twelve thousand two hundred fifty-seven barrels of oil through December 1957.

Q Now, are there any other wells in the area of the subject well producing from the Seaman Pennsylvanian formation?

A No, sir.

Q In your opinion, are these three wells you have mentioned economically sound?

A Taken individually, our well is not, the Penrose well is not, the Pure well apparently is not, the Sinclair unit well has been producing for over a year, making top allowable and appears to be economically sound.

Q Now, you have heard Mr. Clark testify as to the cost factors on the subject well, various drilling methods, and production area. Could you correlate those cost factors to the reservoir estimate, do you have those factors, those figures?

A I do.

Q Would you correlate those cost factors for us to the reservoir estimate, and particularly with reference to the Pennsylvanian well, the possible use of 5 1/2 inch casing, 7 inch casing, and two strings of tubing, please.

A All right, sir. We have several choices to recover this Pennyslvanian oil. We could drill for the Pennsylvanian oil. To drill a straight up Pennsylvanian well, it is estimated to cost two hundred forty thousand dollars. The reserve indicated by the State "A" No. 1 Forest well in the Pennsylvanian is worth twenty-two thousand eight hundred and thirty-eight dollars. That would result in a loss of, to Forest, of two hundred seventeen thousand, one hundred sixty-two dollars. It is hardly worthwhile. We could project a Pennsylvanian well and Wolfcamp dual using 7 inch pipe, two strings of tubing, which would cost us an additional sixty-four thousand dollars above the cost of drilling to the Wolfcamp and abandoning the Pennsylvanian.

Q Plus, in good field practices, rimming it up above?

A Right, we would have to determine, before we started drilling the well, that we would drill holes large enough to accommodate the 7 inch pipe which would accommodate the two strings

of tubing.

Q Excuse me right there, Mr. Parsley, as I understand you, had you been able to foresee this and had used the larger hole originally, and used a 7 inch, it still would have cost you sixty-four thousand dollars more on the 7 inch two strings than it does on the proposed method to recover the oil?

A No, sir, it would cost us sixty-four thousand dollars more to obtain Pennsylvanian production.

Q That's what I mean, sir, and you get twenty-two --

A Below the Wolfcamp.

Q All right, go ahead, sir.

A Subtracting the value of the Pennsylvanian oil from the sixty-four thousand dollars that it takes to get it, it results in a loss to Forest of forty-one thousand one hundred sixty-two dollars. We can recover the Pennsylvanian oil by dually completing the Wolfcamp and Pennsylvanian using 5 1/2 inch casing and one string of tubing in our present completion for a cost, an additional cost of thirty-two thousand dollars above that spent to get to the Wolfcamp. In other words, thirty-two thousand dollars additional to place the Pennsylvanian on production after we have reached the Wolfcamp. Subtracting the value of the Pennsylvanian oil from the thirty-two thousand dollars still results in a loss of ninety one hundred and sixty-two dollars.

Q So if you take the initial method of drilling a twin well to the Pennsylvanian, it would cost two hundred twenty thousand

dollars to get this twenty-three thousand. If you had been able to anticipate it and used 7 inch with two strings, it would cost you sixty-four thousand dollars extra to get this twenty-three, and if you use it on the present or proposed method, it will cost you about thirty-one thousand to get the twenty-three thousand?

A Yes, sir.

Q Now, the question has been asked previously about pumps. Are there economic factors in placing one or more of them on the pump?

A Yes, sir. On the type recovery mechanism that we believe we have in the Pennsylvanian; that is, solution gas drive recovery, a well with an initial adequate capacity to produce like we have does not normally require pumping until later in the stages of depletion. That is because as the well is depleted, the gas-oil ratio increases, lightening the fluid column, making the well -- although the reservoir pressure is going down, the fluid column flowing through the casing, tubing, is lighter, and is not a severe pumping problem. Late in the life of a solution gas drive field, the ratios come down, and at that time it is common to instigate pumping for that particular well. However, in a reservoir as small as this one is, the amount of oil to be recovered at that late stage of depletion is insignificant, usually in the order of five percent of your reserve remains, and five percent of our ten thousand barrels of oil is hardly worth placing

the well on the pump.

Q So you would not anticipate ever placing the Pennsylvanian well on the pump based on your reservoir estimates?

A No, sir.

Q Now, in the event the Wolfcamp would have to go on the pump in later years, would you still be producing from the Pennsylvanian?

A No, sir. If our estimates are correct, the Pennsylvanian will be depleted shortly.

Q Do you mean in a matter of months?

A Yes, sir, if it continues at top allowables, it would only be a month, however, it probably won't.

Q It is a relative short life equivalent?

A Yes.

Q Have you encountered any water problems in the subject well, or have the other Seaman wells encountered water problems?

A No, sir.

Q Now, are there any other wells near the subject well in the two pools on the pump?

A In the Wolfcamp, yes, sir.

Q There is none in the Seaman Pennsylvanian?

A No, sir.

Q Now, in the Wolfcamp, are there any?

A Yes, sir, there are two wells out of a total of twenty-two wells in the Kemnitz Wolfcamp field. One of those wells is

the Seaman unit, Sinclair Seaman unit well No. 2, located in Section 19. The other well is the Shell "WD" No. 1 located in Section 29.

Q Now, do you know why they are on the pump?

A Yes, sir, I have an opinion.

Q All right, sir, what is that opinion?

A The Shell well is fairly low structurally in the Wolfcamp. The Shell penetrated the known estimated oil contact of minus 6670, and actually perforated into the water. Shell tried to squeeze off the zones in the water, but were not successful. The well continuous to make water, and their problem is water production, lifting the water.

Q So that's the reason for Shell's well being on the pump?

A Yes, sir.

Q How about Sinclair's No. 2 well that you mentioned before?

A Sinclair's well had a very thin section of Wolfcamp. It is not a normal Wolfcamp well. It has been a marginal well from the beginning, and it happens to be one of the wells that does not have adequate capacity to flow. It needs help, therefore, it is pumped.

Q Now, those are the only two wells on the pump in the area in question?

A Yes, sir.

Q Now, could you give us a short summary of the economic problems in the instant well, or subject well, and any future development of wells of this type in this Seaman Pennsylvanian area, and your economic problems involved?

A Well, apparently, we have made a mistake in our well. The Pennsylvanian wasn't worth it, so we apparently will lose money, however, that does not altogether condemn the area as far as Pennsylvanian is concerned, since Sinclair's Seaman unit No. 1 is a good Pennsylvanian well. If we could get wells like that, we want to explore for them. However, with the poor performance of the majority of the wells staring us on the face, you have to use some costs, and you want to do it the most economically manner possible, consistent with good production practices. We would like to -- another point, we believe the Wolfcamp is economic, we want to develop our leases, and we, occasionally we want to, when we have geologic reason, we want to test the Pennsylvanian, but we do not want to start every well as a potential elaborate dual Wolfcamp Pennsylvanian, we want to be able to place our Wolfcamp on production in the general accepted manner, and explore for the better Pennsylvanian reservoirs.

Q In your opinion, is it economically sound to commence a project to project it to the Pennsylvanian in this area and to know that you are going to have to dual it in the Wolfcamp and Pennsylvanian if you get it. Do you feel that is economically sound, based on the other Seaman Pennsylvanian wells?

A The majority of the wells, no. There is one hope that we can find. The reservoirs are small, but they are of different size, of course. Apparently, Sinclair found a better one, and we hope to find something like that, but we have no assurances of it.

Q Do you feel that a requirement on your company or any other company in the area to expend more than the additional thirty or thirty-two thousand dollars to test to the Pennsylvanian, is that an economic requirement? Economically speaking, can you meet such a requirement?

A It is not sound.

Q It is not sound? A No.

Q I have one or two other questions, Mr. Parsley, in the event this application is denied, what would you recommend the Forest Oil Corporation do concerning future development in this area with relation to Pennsylvanian Wolfcamp tests?

A I would recommend in our first well, that we abandon the Pennsylvanian and protect ourselves in the Wolfcamp, and that there would be no economical justification to continue to explore for Pennsylvanian reservoirs in this area.

MR. CHRISTY: That's all.

MR. UTZ: Are there any questions of the witness?

MR. COOLEY: I have some.

MR. UTZ: Mr. Cooley.

CROSS EXAMINATION

BY: MR. COOLEY:

Q Is your name Mr. Parsley?

A Yes, sir.

Q Mr. Parsley, it is possible, is it not, to deplete the Pennsylvanian zone with your present completion and then plug back to the Wolfcamp and produce that zone through a single completion?

A Yes.

Q The only obstacle to this procedure being that there is a possibility that you might be drained by the offset wells, especially the Tennessee Transmission Company's "B" State Kemnitz Well No. 3?

A In the Wolfcamp, yes, sir.

Q That is the moving reason here, is it not, everybody saying they got to plug back to protect themselves in the Wolfcamp, if they want to produce this way?

A Yes, sir.

Q Now, having assumed that drainage is occurring, can you tell me how far it is between those two wells?

A One half mile.

Q As a reservoir engineer and being familiar with the Wolfcamp reservoir, that well will drain a radius of one half mile? A Yes, sir.

Q A radius of one half mile --

A Yes, sir.

Q --to any great degree? A Yes, sir.

Q How long has the Pennsylvanian well been producing?

A Several months.

Q Any oil that they have -- assuming there is drainage, any oil that they have drained is lost as of now, isn't that right, anything they have drained from you is forever lost to you?

A Right.

Q What do you estimate the remaining life of the Pennsylvaniar pool is? A Pennsylvanian?

Q Did you say that if it produced at top allowable, it would be gone in one month, or certainly in less than six months? A Yes.

Q Less than three months?

A About three months.

Q About three months. Do you have initial pressures on the Wolfcamp zone in your well?

A Yes, sir.

Q Have you ever taken drill stem pressure tests? Do you have pressures on that well? A Yes.

Q Have you ever taken any subsequent pressure --

A No, sir.

Q Would it not be possible, by taking subsequent pressures on it, to determine if any communication does exist between that well and any other well?

A It would be. I think our pressure that we have proves

it.

Q Well, the pressure as you pointed out a moment ago, your initial pressure and the amount of oil that is in the reservoir and in your tank at the time you completed this is all you are entitled to, and if somebody beside you drained it out from you, it is too late to get that.

A I suppose we lost that.

Q You lost that as a matter of a race in drilling. The only drainage we are talking about is the one between the present time, and not what is behind because that is lost forever, so the only thing we can prevent in the way of drainage, is the drainage that might occur at the present time, and at the time the Pennsylvanian is depleted, and such time as you could plug back and commence production from the Wolfcamp to create your zone of low pressure, and thus try to offset the drainage problem that is occurring, if there is one?

A That's right, future drainage.

Q Future drainage is all you can prevent, you can't prevent the past drainage? A That's right.

Q You have a three month period in which you estimate --

A Approximately that. We hope we are wrong; we hope the Pennsylvanian is a little better.

Q Well, that's what they are paying for, your expert opinion as to how much longer it is going to produce, and we also accepted your qualifications as an expert witness and accepted that

these figures are pretty close to correct, so you have, roughly, a three month period over which drainage could occur, if there is any at all. Now, won't the drainage danger be increased if the well would be 660 feet? Your offset well could be as near as 660 feet under the rules, and the drainage would be greater, would it not, the nearer you are to an offset well?

A Slightly.

Q You think the gradient is very slight between the outermost boundary of a drainage radius of a well than out near the well bore? Isn't it a rather constant gradient?

A As far as depletion is concerned.

Q Would it not be possible to take pressure readings on your Wolfcamp zone at the present time and tell whether there has been any material decline in pressures between the time the well was completed and the time of the test?

A Mechanically possible.

Q Would it be feasible economically, and would the result be worth it if you took such tests? Could you anticipate what quality of oil had been drained, or to what extent it is being drained, or whether the cost of --

A We could watch our pressure go down.

Q And would the cost of such tests be prohibitive? How expensive are they, to take a pressure reading on this Wolfcamp zone as you are presently completed?

A I don't know how much it would cost.

MR. COOLEY: Can any of your witnesses estimate that cost?

MR. CLARK: About seventy-five dollars.

A Seventy-five dollars for the pressure test. It would cost us an additional one hundred seventy-five.

Q (By Mr. Cooley) It would cost you about two hundred dollars?

A Two hundred dollars to get the pressure.

Q Wouldn't that be worthwhile information, to find out whether you are in fact being drained or not, or whether you could continue to produce this Wolfcamp or this Pennsylvanian zone?

A Well, it would be interesting, but I feel that it would be academic.

Q Do you feel there will be absolutely no loss in recovery as a result of casing flow of water from the Wolfcamp zone?

A Ultimate recovery from the field will not be decreased.

Q Not in the slightest?

A If you are talking about --

Q I am talking about your particular well now, your particular completion. Do you think that the recovery would be exactly the same amount through casing even though there is going to be a loss in reservoir energy?

A Well, that particular well will be a single Wolfcamp completion at depletion. Six months estimate.

Q What I was trying to get was a comparison between any

loss, if there be one, as a result of casing flow, and what all you might lose as a result of drainage if you contine to produce from the Wolfcamp during the next three months period.

A We will lose three months of Wolfcamp production, if it is three months.

Q Even without any pressure information, subsequent pressure tests, you are absolutely positive that you are being drained by this well one half mile away?

A Yes, sir, we have a little information on that. The estimated original pressure in the Kemnitz Wolfcamp was thirty-seven hundred and eighty pounds, according to prior tests, and we measured the pressure of the Forest State "A" No. 1 by drill stem test and found it to be thirty-two hundred and eleven pounds. That was in December of '57. A field wide pressure test in the Kemnitz Wolfcamp indicated an average reservoir pressure of the built up wells to be approximately thirty-one hundred and ten pounds.

Q When was that field wide test taken?

A From December the 1st to the 4th, 1957.

Q And the thirty-two eleven test?

A Sir?

Q The thirty-two hundred eleven test, your drill stem test, when was that taken?

A December the 25th, 1957.

Q Is this thirty-two eleven drill stem type of testing

comparable with the method used on this thirty-seven hundred eighty pounds original pressure of the drill stem test?

A I really don't know. Tennessee Gas testified to that pressure.

Q Could the method of testing, the type of testing, whether it be drill stem test or some other type, cause some variation?

A Yes.

Q Could it account for that month for the five hundred pounds?

A I don't think so.

Q Do you know what other initial pressures of wells in approximately the same point in time as your State "A" well, what pressures were found in those wells?

A No, I don't

Q The reason I ask this question at this point is that if the fieldwide pressure had fallen from thirty-two eleven, which we will say was the true fieldwide pressure of your pool at the time you drilled, then apparently there had been some drainage, but whatever is gone is gone and forever lost to your company, and through no fault of anyone but your company's, assuming that they didn't drill quick enough.

A That's right, when we had information to drill.

Q And the interval I am particularly interested in and which we have no information on is what pressure drop you have suffered between the date of completion and the present time.

A Yes, sir.

Q You don't feel you would be willing to take such tests?

A If it would help this hearing, surely would. I don't know, it is not for me to say. I could recommend it one way or the other.

Q The only position we can take in that regard, sir, is that we won't require such a test in connection with this, and we don't intend to try to compell you to take such a test, but if your company does sometime in the future take such a test, we would like to be informed of the results.

A Yes.

MR. CHRISTY: If a test is taken, we will certainly submit it.

MR. COOLEY: That's all the question I have. Thank you very much.

MR. UTZ: Any other questions of the witness?

MR. CHRISTY: If there is no other question, I have one or two.

REDIRECT EXAMINATION

BY: MR. CHRISTY:

Q Now, Mr. Parsley, Mr. Cooley mentioned to you several times drainage by the Tennessee Gas and mentioned correctly that the two wells were approximately one half mile away, but as a matter of fact, isn't it less, the Forest lease is closer than one half

mile? A Yes, sir.

Q Now, secondly, he mentioned the drainage by the Tennessee well to the east. Now, does the reduction in pressure from production throughout the whole field cause an ultimate loss of recovery to your well?

A Yes, sir.

Q The pressure in the pool is what I have relation to, that type of drainage as distinguished from actual oil moving drainage, would you explain that pressure?

A I think this is a continuous Wolfcamp reservoir.

Q Excuse me, but I believe your pressure, when you completed your well, was the same as the field pressure?

A Approximately.

Q Approximately the same. Doesn't that indicate that that is one continuous pool? A Yes, sir.

Q All right, sir, go ahead. Our well in this reservoir -- As oil is taken out, we share in the reservoir oil, or do not share, as our well is completed or not completed.

Q Now, also, the reduction in pressure in the field as such will reduce your ultimate recovery at the end of the recovery period, wouldn't it? A Our well?

Q Yes, sir, in addition to the oil migration which Mr. Cooley has mentioned, there will be a reduction of pressure in the pool as a consequence, and there again you will not be able to make as much recovery oil because of the lower pressure

A Right.

Q So there is two losses of drainage, one by oil migration and one by pressure loss in the pool? A Yes, sir.

Q One which you suffer immediately and one which you will suffer at the end of the reservoir --

A Yes, sir, we lose oil from our No. 1 well by not having it on production in this reservoir.

Q Both from oil movement and from reduction in pressure?

A Yes, sir.

Q And it does not take as much time to produce it while the reservoir is sufficient to get it out of there?

A Yes, sir.

Q Now, you mentioned this three months period in the Pennsylvanian, and I believe Mr. Cooley kept speaking of three months. Did you say an estimate of three months to six months?

A Yes, sir. Now, our well continuous to make top allowable, and one estimate would be twenty a month, if it continuous to make top allowable, and we don't think it will decline.

Q So it will probably be three to six months?

A Yes.

Q And I believe you completed the well some two months ago in the Wolfcamp, so you have already lost two months of oil migration, drainage, subsequent to your date of completion?

A True.

Q And the only way we are going to tell whether it is three

months, six months, or seven months in the Pennsylvanian is to produce it out of there? A Yes, sir.

Q We could make a reasonable estimate of three to six months, and that is the best we can do right now?

A Yes, sir.

MR. CHRISTY: That's all.

MR. UTZ: Is there any further questions of the witness?

MR. COOLEY: I have one more question.

RECROSS EXAMINATION

BY: MR. COOLEY:

Q What do you estimate the life of the Wolfcamp pool to be, sir? What do you estimate the producing life of the Kemnitz Wolfcamp pool to be?

A Seven to ten years. I really have no -- The only thing I can base that on is the comparison to the Townsend. The Townsend has been on production approximately six years, I believe. Their performance history indicates they are well along in their depletion cycle.

Q There wouldn't be any physical obstacle, would there, in depleting and going back up after ten years to --

A No, sir, no physical obstacle.

Q I believe you said twenty-two thousand dollars out of it would be worth --

A Very little.

Q About zero ten years from now.

A We would have quite an investment tied up.

Q It affects the economic life of your well?

A Yes.

MR. COOLEY: Thank you.

MR. CHRISTY: One last question.

REDIRECT EXAMINATION

BY: MR. CHRISTY:

Q This thirty-two thousand that it has cost you to go to the Pennsylvanian in your present method, if you shut in your Pennsylvanian and produce from the Wolfcamp for ten years and then go back to the Pennsylvanian, you have had your thirty-two thousand sitting in the hole for ten years?

A Yes.

MR. CHIRSTY: That is all.

MR. NUTTER: You have spent that thirty-two thousand dollars whether you get anything out of the Pennsylvanian or not?

A Yes.

MR. UTZ: Are there any more questions? If not, the witness maybe excused.

(Witness excused.)

MR. CHRISTY: We have no other witnesses for the Applicant.

I would like to mention, in summary, one or two items. In the first place, it is very obvious that the well is being

drained in the Wolfcamp, and unless it is produced from the Wolfcamp, the State of New Mexico is going to lose money and we are going to lose money, and our correlative rights will be violated as well as the State's, so No. 1, we have to produce in the Wolfcamp and in the Pennsylvanian, which we believe that the evidence has developed that there are small stratigraphic traps and that there is no drainage.

We have not asked for this dual completion based on drainage on the Pennsylvanian, but on the fact that there is such a small amount of recoverable oil in the Pennsylvanian that the only method that we can economically employ to recovery that oil is by the proposed type of dual completion.

We realize and recognize that the Commission noramlly likes and requires 7 inch two strings of tubing, but economically, that is just infeasible. We might as well throw the oil away, as to try to do it that way in this instance. If we got such a well as the Sinclair, that might be a different story, but we just don't have it. It is economically unsound to twin the well for two hundred forty thousand dollars. We can't physically do it in the 7 inch two strings of tubing manner without having to rig out the hole, and if we did that, we might as well twin it and spend thirty thousand dollars, so again, it in economically infeasible. It is physically impossible to run inch and a half tubing in there for two strings, but again, this Commission feels that that is poor conservation practice, and has in another case

rejected it, so it appears to us that the only sound method to allow the recovery of the Pennsylvanian oil in the State of New Mexico, is to allow us to dual complete this with a small string, with five and a half inch casing. That will allow us to recover out fair and just share of the oil in the Pennsylvanian, and it will allow the State of New Mexico to recover its royalty in the Pennsylvanian oil, which is for other intents and purposes lost.

The dual completion method has been tested as a sound method and has been used in Texas, Louisiana, and Mississippi, I believe, for many years.

In the final analysis, unless some type of dual completion along this line is allowed in these isolated instances, when you run into small tanks of this nature, like the Pennsylvanian's, the effect of it is that the producers and the operators are just economically not going to be able to test for these small stratigraphic traps, they are just not going to waste the time putting in two hundred forty thousand or two hundred and eighty thousand dollars with a very very minimum chance of getting one of these small stratigraphic traps, so as a consequence, they have to go on and drill for the known producers in the Wolfcamp and take a gamble for thirty thousand, and hope that they might get a Sinclair, but if they don't, they might get a Penrose, but the odds against them are too fantastic for them to expend two hundred and forty thousand dollars as an additional investment.

That's all we have.

MR. COOLEY: Mr. Christy, I have reserved asking these questions of any of your witnesses for reasons that they are purely legal, and I am not going to make a statement to the Commission with regard to one facet of this case, but if you will refer to Rule 112-A of the New Mexico Oil Conservation Commission Rules and Regulations, Rule 112-A states:

(a) The dual completion of any well may be permitted only by order of the Commission upon hearing, except as noted by Paragraph (c) of this rule.

Rule (c) Is not applicable to this case. Then, Paragraph (b) states:

(b) The application for such hearing shall be submitted in triplicate and shall include an exhibit showing the location of all wells on applicant's lease and all offset wells on offset leases, and shall set forth all material facts on the common sources of supply involved, and the manner and method of completion proposed.

And I might emphasize the last word of that Rule, "proposed". It has been the common understanding that it is not only not permissible, but it is against the Rules and Regulations of this Commission to dual complete a well prior to seeking the Commission's approval, thus the expenditure by your client, Forest Oil Corporation, of these additional monies in completing this well without any authority whatsoever, will not be taken into consideration in this case.

MR. CHRISTY: That is perfectly satisfactory.

MR. COOLEY: It will be considered as if it were a proposed dual completion. The fact that you spent your money will not be considered in any fashion.

MR. CHRISTY: It is perfectly satisfactory. We are producing only from the Pennsylvanian, we have never attempted to dual complete it.

MR. COOLEY: I realize that, but they have equipped this well as a dual completion, and now the arguments are being made that the Commission should take into consideration the expenditure which they have made to dually complete this well.

MR. CHRISTY: The expenditure of thirty-two hundred dollars includes the drilling, that is my understanding, so that about seventeen thousand of it relates to the completion, so I agree with the Commission. You might not wish to take into consideration the seventeen thousand for completion, but I do not agree that you should not take into consideration the fifteen thousand for drilling to the Pennsylvanian in making the test.

MR. COOLEY: That is a touchy question, Mr. Christy. When you drill through two zones the well which you anticipate producing, you have two courses of action which you may take; one being producing singly and keeping one shut in until the other is depleted, and the other being dual completion. Now, if you drill this in anticipation of dual completion, I don't know what the circumstances are.

MR. CHRISTY: I believe the testimony was that it was drilled as a Wolfcamp test, and that at the point of the Wolfcamp, it was feared that they would have a dry hole, and then they went on down to the Pennsylvanian. There was never any drilling program of dual completion initially, even though it was a Wolfcamp test, but I follow the Commission's argument on this seventeen thousand dollars.

MR. COOLEY: That is the only point I wanted to raise in regard to the legal facets of this case. That's all.

MR. UTZ: Mr. Christy, did you offer your exhibits?

MR. CHRISTY: We would like in evidence Exhibits 4 through 7 inclusive.

MR. UTZ: Is there any objection to the entrance of these exhibits? If not, they will be accepted.

Are there any other statements in this case? Mr. Kellahin.

MR. KELLAHIN: Jason Kellahin, of Kellahin and Fox. I would like to make a brief statement on behalf of Amerada Petroleum Corporation.

Amerada Petroleum Corporation is not an operator in the area involved in this application, and we realize that Forest Oil Company does have an economic problem at this stage of the situation with which we have great sympathy, however, Amerada does hold the premise that this case will open the door to future applications and possibly future approval of this type of an oil-oil dual, and we want to go on record as being opposed to the

completion as proposed in this case. It is a type of completion which has heretofore been denied approval by the Commission in a number of different cases, and Amerada does not feel at this time that the Commission should open the door to this type of completion. They do not feel it is efficient and effective, and we urge the Commission to follow its present policy and deny this application.

MR. UTZ: Are there any other statements?

MR. COOLEY: If there are no other statements, I would like to bring this up, I have an item I would like to bring up with Mr. Christy. Mr. Christy, I refer you to Forest Oil Corporation's letter of January 22nd, 1958 wherein they notify all the offset operators of their intention to dually complete the State "A" No. 1 well, which has been the subject of this hearing. In the letter itself there is no mention of the mechanics of the proposed dual completion. The enclosures which we received attached to this letter would apprise the operators of the fact that you proposed a casing for the flow of oil. The letter itself would not, and I would like to know if --

MR. CLARK: A schematic sketch was attached. They were aware of the fact that it was a conventional dual completion.

MR. CHRISTY: In answer to your question, Mr. Cooley, a copy of Applicant's Exhibit No. 4 was furnished to all offset operators in connection with that letter of the 22nd.

MR. COOLEY: Now, would you like to identify the six

waivers?

MR. CHRISTY: We haven't previously offered to the Commission waivers from the following offset operators: Tennessee Gas Transmission Company, Humble Oil and Refining Company, Phillips Petroleum Company, Cities Service Oil Company, Signal Oil and Gas Company, and Tidewater Oil Company, and we also have one from Shell, which is erroneously shown on the map as being an offset operator to the northeast. That is incorrect, it was Sinclair, as I mentioned a while ago to the Commission. Sinclair has been notified of the hearing and was furnished a copy of the application, and Applicant's Exhibit No. 4. I would like to leave that.

MR. COOLEY: Do you want to identify that as an exhibit?

MR. CHRISTY: Yes, as an exhibit. Those letters, or waivers are marked as Applicant's Exhibit 8, which we ask the admittance of.

MR. UTZ: Is there any objection to the entrance of Applicant's Exhibit 8? If not, they will be accepted.

Are there any other statements in this case? If not, the case will be taken under advisement and the hearing is adjourned.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, J. A. Trujillo, Court Reporter, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in Stenotype and reduced to typewritten transcript by me, and the same is a true and correct record to the best of my knowledge, skill, and ability.

WITNESS my Hand this 5th day of March, 1958, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Joseph A. Trujillo
Court Reporter

MY COMMISSION EXPIRES:

October 5, 1960

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1853, heard by me on Feb. 26, 1958.

....., Examiner
New Mexico Oil Conservation Commission