CASE 6530: AMOCO PRODUCTION COMPANY FOR UNORTHODOX GAS WELL LOCATIONS, TEMPORARY INJECTION OF PRODUCED GAS, AND VENT GAS, UNION AND HARDING COUNTIES, NEW MEXICO

CASE NO.

6530

APPLICATION,
TRANSCRIPTS,
SMALL EXHIBITS,

ETC.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
State Land Office Building
Santa Fe, New Mexico
25 April 1979

EXAMINER HEARING

IN THE MATTER OF:

Application of Amoco Production Company for unorthodox gas well locations, temporary injection of produced gas, and to vent gas, Union and Harding Counties, New Mexico. CASE 6530

BEFORE: Richard L. Stamets

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division: Ernest L. Padilla, Esq.
Legal Counsel for the Division
State Land Office Bldg.
Santa Fe, New Mexico 87503

For the Applicant: Guy T. Buell, Esq.
Amoco Production Company
Houston, Texas

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

I N D E X

E X H I B I T S

MR. STAMETS: We'll call next Case 6530.

MR. PADILLA: Application of Amoco Production Company for unorthodox gas well locations, temporary injection of produced gas, and to vent gas, Union and Harding Counties, New Mexico.

MR. STAMETS: Call for appearances in this case.

MR. BUELL: Representing the applicant, Amoco Production Company, Guy Buell. I have one witness, Mr. Jim Allen.

MR. STAMETS: Any other appearances in this case? I'd like to have the witness be sworn, please.

(Witness sworn.)

MR. BUELL: Mr. Examiner, while Mr. Allen is taking his seat, I might make a very brief opening statement.

I'm sure you're aware of Amoco's efforts, and the efforts of others to form what we are calling the Bravo Dome CO_2 Unit in Union, Harding, and Quay Counties, in ortheastern New Mexico.

I'm also sure that you're aware that this is rather sparsely developed area. In the interest of gathering more reservoir data, Amoco is embarking upon a 20-well development program. We intend to maximize the data gathering from these wells and it's our intention to core completely

through the Tubb formation, which is the formation that is productive of CO_2.

In connection with that 20-well program, the hearing that we're having today is part and parcel of our intense desire to gather the maximum amount of data possible. And that is why we're appearing before you here today. We're, as Mr. Padilla pointed out, we're asking for approval of two unorthodox well locations. We're going to drill another well tied in with this program we'll review with you today, at an orthodox location. We're asking for authority to inject gas and we're asking for authority on a short term basis to vent CO_2 produced from one well, one of the wells in this testing program.

JIM ALLEN

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

DIRECT EXAMINATION

BY MR. BUELL:

Q. Mr. Allen, would you state your complete name, by whom you're employed, and in what capacity? And at what location, please, sir?

A. James C. Allen, Staff Petroleum Engineer with Amoco Production Company at Houston, Texas.

Q. Mr. Allen, you have appeared at previous hearing before the Oil Conservation Division, have you not?

A. Yes, sir.

Q. And your qualifications as a petroleum engineer are a matter of public record in the files of those cases before the Conservation Division?

A. Yes, sir.

MR. BUELL: May it please the Examiner, are there any questions of Mr. Allen's qualifications?

MR. STAMETS: The witness is considered qualified.

Q. (Mr. Buell continuing.) Before we go into any of the exhibits, Mr. Allen, would you like to elaborate slightly on some of the comments that I made in my opening statement, with regard to, particularly to the purpose of these tests that we're going to review today before the Examiner?

A. Yes, sir, I just, kind of briefly, as you have noted, the 20-well program was designed to collect and to get additional reservoir data by coring all 20 wells; we will be able to obtain additional reservoir parameters. This will help us in confirming our reservoir calculations. It will also help, we feel, later when we make recommendations for spacing and field rules, and the wells in which we're asking for today are in an area where some wells have

already been drilled and we do have some test data available to us, and we would like to take advantage of that to get some additional data.

Q. And all of these data will be intensely important to the continued work and the, hopefully, the formation of the Bravo Dome CO_2 Unit.

A. Yes, sir.

Q. All right, sir, I believe the notice on the docket sheet says that we have two leases involved today. Is my observation correct?

A. Yes, sir.

Q. What are those leases, Mr. Allen?

A. The State FI lease and the Heimann lease.

Q. Is there any particular reason why these two leases were selected for the program that we're proposing here today?

A. Yes, sir, on both those leases there already exist two wells that have been drilled and they have reasonably good interference test data that was run several years ago, and we feel like adding to them and using these two wells will considerably aid our analysis of the formation.

Q. Needless to say, the three wells that will be drilled in connection with the program we're here on today, they'll also be cored completely through the Tubb formation?

A. Yes, sir, they will.

Q. All right, sir. One of those leases is Amoco's State FI lease; the other is the Amoco Heimann, H-EI-M-A-N-N, Heimann lease, is that correct?

A. Yes.

Q. Which one of these would you like to start on first?

A. I really don't have any preference.

Q. Well, let's start on the State FI first. I believe that's the way we've numbered our exhibits. And in that connection, would you direct your attention to what has been identified as Amoco's Exhibit Number One and state for the record what that exhibit reflects.

A. Yes, sir, Exhibit Number One is a nine-section map showing the location of the Amoco State FI lease, being Section 36, Township 20 North, Range 33 East.

Q. That State FI lease of ours appears to be approximately a 640-acre lease.

A. Yes, sir.

Q. All right, sir, what about the -- currently how many wells does it have on it there in Section 36?

A. There are two wells on that lease, the State FI 1 and Well No. 2, and they're identified by conventional gas well symbols.

Q. If memory serves me correctly, No. 1 is a

producing well. It was a well that was produced in the prior interference test that was run, is that correct?

A. That's correct.

Q. And No. 2 was permitted and was used solely as an observation well?

A. That's correct.

Q. All right, sir. What do we propose to do is expansion of this area in which we conducted the prior test?

A. Yes, it is.

Q. What are we going to do to expand that area?

A. We propose to drill the State FI Well No. 3 at a location 1980 feet from the east line, 1315 from the south line, which will be 655 feet due north of Well No. 1.

Q. And while we're asking for that well to be permitted at that unorthodox location for all purposes, during this test it's going to be used as an observation well, is that correct?

A. That is correct.

Q. All right. Is the orientation of these three wells that I see on Exhibit One, is that important to -- in any way from the standpoint of gathering reservoir engineering data?

A. Yes, sir, it is.

Q. And in what way, Mr. Allen?

A. By locating a well 90 degrees apart, as these

are, and essentially equidistant from the producing well, we will be able to determine if permeability orientation does exist.

Our previous interference testing indicated that there was a little bit of discrepancy between our calculated log-derived BH and our performance derived porosity feet. Permeability orientation would explain this --

Q. And that is one of the reasons that our proposed Well No. 3 is located at the unorthodox location, as we see on Exhibit One?

A. Yes, sir. This eliminates the distance that's a factor in our calculations.

Q. All right, sir. Let's go into some of the details of the test itself. Is this proposed to be a long term test or a short term test?

A. No, sir, we propose this as a short term test for no more than a period of 45 days.

Q. Again, will Well No. 1 be the producing well in this test?

A. Yes, sir, it will be.

Q. What do we propose to produce Well No. 1 at during the test interim?

A. Our plans are to produce it at a rate of 2000 cubic feet a day. Excuse me, 2000 MCFD.

Q. All right, sir, let me ask you this. What

will we be looking for? This is an interference test, as I understand it, among other things. What will be be looking for on the two observation wells?

A. We hope that we will see at least a five pound pressure drawdown at each one of the two wells. We're looking for positive signs of interference.

Q. And in your opinion, if we do observe a five pound pressure drawdown on either Wells 2 or 3, that would be indication of pressure interference and at that point the test could be terminated.

A. Yes, sir, they would be.

Q. And we're asking for 45 days purely as a maximum?

A. That's correct.

Q. And hopefully, we will not need to test for that long?

A. That's correct.

Q. All right, sir, why was the State FI selected for this very short term test, this 45 day maximum test?

A. Of the two leases that we looked at, interference was seen much sooner in the State FI than it was on the Heimann lease, and therefor we feel like we can get the data in a much shorter period of time.

Q. And since there are no facilities for saving and marketing the CO_2, it will be vented?

A. Yes, sir.

Q. And that's the reason it's going to be a short term test and immediately that we obtain the data in the way of drawdown, the well will be shut in and the venting stopped?

A. That is correct.

Q. Do you have anything else with regard to the test on the State FI lease?

A. No, sir, I don't believe so.

Q. All right. Let's turn now to the Heimann lease and in that connection let me draw your attention to what has been identified as our Exhibit Two.

What is Exhibit Two, Mr. Allen?

A. Exhibit Two is a map of the area around the Amoco Heimann lease, which shows both the unorthodox location for Well No. 5 and the proposed orthodox location for Well No. 4.

Q. All right, sir. The two existing wells are located in what section?

A. They are located in Section 3 of Township 19 North, 33 East.

Q. All right, sir, looking at all the hooks on this map, it would appear that our Heimann lease covers a very extensive area just on the portion depicted on our map.

A. Yes, sir. In fact, there's over 6000 acres indicated just on this portion of the map alone.

Q. All right, sir, where will the proposed injection well, temporary injection well, Well No. 4 be located?

A. Well No. 4 will be located 1980 feet from the west and south lines of Section 34, Township 20 North, 33 East.

Q. And that is at an orthodox location?

A. Yes, sir.

Q. And that well will be permitted as producer for all purposes, but for the purpose of this test, we will use it purely as an injection well?

A. Yes, sir.

Q. All right, sir. Do we find on the Heimann lease, as we did on the State FI, that the two existing wells are numbered 1 and 2?

A. That is correct.

Q. Again do we find that the No. 1 was permitted as a producing well and No. 2 is purely an observation well?

A. Yes, sir.

Q. All right, sir, let's talk for a moment about the location for Well No. 5. Would you state that location for the record, please?

A. Yes, sir, Well No. 5 is located 1315 feet from the west line, 660 feet from the south line, being 655

feet due east of Well No. 1.

Q. And that is also, as was the case with the additional well on the State FI lease, an unorthodox location.

A. Yes, sir, it is.

Q. Are we asking that it be approved for all purposes, even though in this particular test it will be used only as an observation well?

A. Yes, sir.

Q. We've been discussing the Heimann 1, 2, 4, and 5. What happened to No. 3?

A. Well No. 3 is located some -- it's off this map; it's about six miles north of this area.

Q. Well, the Heimann lease, it covers even a larger area than the 6000 plus acres that are on this exhibit?

A. It sure does.

Q. All right, sir. Was there any particular reason why the Heimann lease was selected for the test that we propose for it?

A. Yes, sir. There were several reasons, one reason being that during the interference test earlier run, we did not see interference near as soon on the Well No. 2 as we did not the State FI lease. Also, because of the size of the lease itself, we could locate the injection well

on the same basic lease, so we would be producing gas from the same lease and then re-injecting it on the same lease.

Q We might point out, I believe, for the record, when we're using the word "gas" throughout this hearing, really we're talking about CO_2.

A. Yes, sir, we are.

Q. Gotcha, we use the words synonymously?

A. Yes, sir.

Q. Why was it necessary to locate this temporary injection well so far from the three control wells in the test area?

A. There are two main reasons, the first being that we felt we needed to locate the injection well at sufficient distance that it will not cause any disruptions in the test data that were in the interference test.

Q. And if it were any closer than this some mile and a half, mile and a third, the very injection of the CO_2 back into the Tubb might distort the interference data that you were attempting to gather on your observation well?

A. Yes, sir, we feel it could.

Q. Or you could say it would interfere with the interference data?

A. Yes, sir.

Q. All right, sir, since our temporary injection

well, Well No. 4, is not drilled as yet, you can't have a log on it. Do you have a log on a well in this immediate area?

A. Yes, sir, I have a copy of the gamma ray neutron density log run on the Heimann Well No. 2, which is the closest existing well to our proposed Well No. 4.

Q. Mr. Allen, that's been identified as our Exhibit Number Three. Do you have any comments to make on that exhibit?

A. Only that we have noted on the log at a depth of approximately 2340 feet, we've shown the top of the Tubb formation and the base of it. I've also indicated the perforated interval within this wellbore.

Q. The No. 2 Well is an observation well but an observation well can't observe unless it's open to the formation either through open hole or by perforations, is that correct?

A. Yes, sir.

Q. Would you anticipate that the log characteristics on our No. 4 when it is drilled will be very similar to our Exhibit Number Three?

A. Yes, sir, I do.

Q. All right, sir, do you have any other comments on Exhibit Three?

A. No, sir, I don't believe so.

Q. Turn your attention then if you would very quickly and very briefly to what has been identified as our Exhibit Four. What is that exhibit?

A. Exhibit Number Four is a proposed wellbore sketch at the Heimann Well No. 4, which would be used as a temporary injection well. It shows the casing strings we propose to run and the cementing program.

Also, I would like to note that in this particular wellbore it shows that we will top-set the Tubb and drill open hole into the Tubb formation, the reason being here is that we would like to obtain a native state core using air as the coring fluid.

Q. All right, sir, any other comments on Exhibit Four?

A. No, sir.

Q. Exhibit Five is another wellbore sketch of the proposed completion on our No. 5, the unorthodox location in Section 3. Would you briefly comment on it, Mr. Allen?

A. Yes, sir. This exhibit shows the same information as the previous one did. I will note, however, that we do plan a case through completion on Well No. 5 as opposed to an open hole completion.

Q. All right. Look now, if you would, at our Exhibit Six. What is that exhibit?

A. Exhibit Number Six is the wellbore sketch of the Heimann Well No. 2 as it now exists, which is the closest well to the proposed injection well.

Q. And Exhibit Seven? What is it?

A. Exhibit Number Seven is the same data for the Heimann Well No. 1, which will be the producing well in this interference test program.

Q. All right, sir, now let's go back and look for a minute at Exhibit Two, and particularly the well in Section 3 where our test will be conducted.

Is the orientation geographically of those wells as critical here as it was on our State FI lease?

A. Yes, sir, it is. We hope to obtain the same type of information. If there is a permeability orientation we would like to know it.

Q. And with the two observation wells each at a 90 degree angle from the producing wells, the data that you've covered on the State FI should also be revealed from this test?

A. That is correct.

Q. All right, sir. Let's go into the test itself now. Is this going to be a short term test, such as we proposed on the State FI?

A. No, sir, it's not. We propose to conduct this test for a period of six months.

Q. All right, sir, and during that six month test period, what producing rate is planned for the producing well, the No. 1 Well?

A. We propose to produce at a rate of a million cubic feet a day.

Q. All right, sir, and all the CO_2 produced from the No. 1 Heimann will be injected back into the No. 4 in the section to the north?

A. Yes, sir, it will be.

Q. So it will not be vented?

A. That's correct.

Q. All right, sir. What do we hope to gain from a long term test that we couldn't realize from, say, a short term test?

A. Well, one of the things that we should be able to obtain from this test is that by running a long term flow test we will be able to evaluated the reservoir parameters in Well No. 1 much better in that the pressure transit will continue to move over this period of time, so we will be able to investigate deeper into the reservoir for reservoir parameters.

In addition, the six month period will allow us to field test our surface producing -- or handling facilities which we will need when wide scale development, our gathering line is built.

Q. Well, actually, Mr. Allen, we've known about CO_2 being in this area for some time, and other than some small isolated CO_2 production that I believe it served a bottling company, Coca Cola, or something like that, there has been very little CO_2 production.

A. I believe that's correct.

Q. So six months deliverability from this No. 1 Well will be of extreme benefit, not just to Amoco, but all the others that are interested in forming the Bravo Dome CO_2 Unit.

A. That is correct. One of the factors that we will get here that I failed to mention that we won't on the other one, is that we will get an idea of what the long term deliverability of these wells may be like. It will help, I think, considerably in our determination of spacing at a latter date.

Q. All right, sir, you also mentioned that surface facilities in connection with our Heimann test, on the State FI we had no surface facilities involved, did we, other than the wellhead?

A. That's correct.

Q. All right, sir, let me direct your attention to what has been identified as our Exhibit Number Eight. What is that exhibit?

A. Exhibit Number Eight is just a simple schematic diagram which illustrates the equipment that will be tested during the six months period.

Q. First, let's cover this all very briefly, Mr. Allen, but I guess the first thing we ought to discuss, you're going to need the line, I'll call it a flow line, to get the produced CO_2 from the No. 1 Well up to the No. 4 Well to the north to be injected, is that correct?

A. Yes, sir, this injection line will be a two and a half inch steel line, one half of which will be internally plastic coated for corrosion protection; the other half which will be bare steel, but we will use a corrosion inhibitor for inhibition.

Q. Is the general path of that flow line shown on the Examiner's copy of Exhibit Two with what appears to be a brilliant burnt orange effect?

A. Yes, sir, it is; obnoxious color.

Q. All right, sir, let me ask you this, why do we have half of this flow line internally plastic coated and half of it just a regular two and a half inch flow line?

A. One of the things we can learn by doing this is that we can evaluate the friction loss in these two segments of pipe. If there is significant difference, then it could aid us in sizing the gathering system line, and it

could result in significant savings in an area of this magnitude.

Q. If the Bravo Dome Unit, as we contemplate it now, becomes a reality, there will be a tremendous flow lines, installation of that type, that will be necessary to connect the producing wells to get the CO_2 to market, will there not?

A. Yes, sir.

Q. Do you feel that these data that we'll obtain during this six month test will be invaluable as far as sizing and designing the ultimate gathering system and flow lines from the Bravo Dome Unit?

A. Yes, I think it will be very helpful.

Q. All right, sir, looking at your chart, starting at the left and moving to the right, first thing you show on the flow diagram is the separator. Do you want to comment on that?

A. Yes, sir, the separator will be, as will the other equipment, be an off-the-shelf type item. There will be no special alloys in it. We will be testing in this operation the effectiveness of various corrosion inhibitors.

Q. A tremendously large proponderance of the wells -- the fluid, is CO_2, is it not?

A. Yes, sir, it is.

Q. About what percentage is it, incidentally, and I realize this would be on the average?

A. About 99 and a half, or better, 99.7, maybe, CO_2.

Q. But there is a moisture that comes up with the CO_2 stream?

A. Yes, sir, there is some.

Q. And the separator will get after that?

A. Yes, sir, it will.

Q. All right, sir, moving to the right on your flow chart, I see compressor. Comment on compressor.

A. Again, the compressor will be an off-the-shelf type item. We will be evaluating, too, the effectiveness of corrosion inhibition to see if we can successfully use compressors out of relatively standard equipment or whether we would have to go to more exotic and expensive stainless steel type.

Q. All right, sir, moving on the right on the flow chart I see dehydrator. Would you comment on dehydrator?

A. Yes, sir, this may be one of the more important items on here, in that we have a contract now with Rice University to determine the best type of glycol, which would be -- well, the best type, most effective, and the most economical, to use in the drying of CO_2, and this would give

us an opportunity, then, to field test the results that they obtain in the laboratory.

Q. I can't help but wonder, Mr. Allen, I see compressor on your flow chart; I know we're going to return the CO_2 back to the Tubb; will this be a high pressure system that we're looking at on your Exhibit Eight?

A. No, sir, the compressor design is for a rate of a million a day at 360 pounds injection pressure.

Q. Relatively low pressure when we're thinking of pressure?

A. Yes, sir, it is, and there'll be even probably less pressure than that on the flow line.

Q. Mr. Allen, whether or not the Bravo Dome CO_2 Unit is formed, and we all sincerely hope it will be, but whether or not it is formed, there will still be a probably significant and tremendous development program in this area of CO_2 wells.

A. Yes, sir, I would think so.

Q. Do you feel that these tests will be of benefit not only just to Amoco but the other lessors and operators in the area from the standpoint of when this development time comes, either unitized or competitive, will be of tremendous benefit in not only designing the surface facilities but also in arriving at the proper and effective de-

velopment pattern that will be required to produce the CO_2 and get it to market?

A. Yes, sir, I think the information would be invaluable, particularly in light of the spacing.

Q. Well, then do you feel that the data we will obtain if these test programs are approved that we're asking for here today, will serve conservation in that they will provide additional data upon which we and other operators can plan a sound development program, both from the standpoint of recovering the maximum amount of CO_2, as well as doing it in the most economic fashion and preventing economic waste?

A. Yes, sir. In fact, it very well could result in the prevention of a lot of unnecessary wells being drilled.

Q. Do you have anything else you'd care to add at this time, Mr. Allen?

A. No, sir, I don't believe so.

MR. BUELL: May it please the Examiner, that's all we have by way of direct. I would like to formally offer our Exhibits One through Eight, inclusive.

MR. STAMETS: These exhibits will be admitted.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Allen, on the No. 4 Heimann injection well, will you monitor that -- the annulus in that hole for any failure of your injection tubing?

A. Mr. Examiner, I'm sure that we will be.

Q. Do you know offhand how you plan to do that? You're just going to leave an annular space open in this well?

A. Our normal procedure any time we use a packer is to load the annular space behind the tubing with a corrosion inhibitor type fluid. I see no reason why we would not follow that standard procedure.

Q. Okay, and then what about the tubing in the injection wells? Is it going to be standard tubing or lined?

A. I believe that as it's proposed it will probably be standard in this test.

Q. In a short term test like this is it going to make any difference?

A. I don't believe that it would. The fluid should not be, particularly on this test, should not be corrosive, or too corrosive, since it will be downstream of the dehydrator, and CO_2 is not particularly corrosive unless it does have water in it, considerable moisture.

Q. Have you checked with the State Land Office and the Oil and Gas Accounting Commission to see if they are going to require payment of royalties and taxes on this flared gas?

A. No, sir, I have not.

Q. Do you have a plan to do that?

MR. BUELL: May it please the Examiner, no, sir, at this time we do not plan to. We certainly not trying to keep it a secret from them, and if you feel that it's adviseable, we'll be happy to.

This State FI lease was involved in our previous test and at that time, also, the gas was vented.

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

Anything further in this case?

MR. BUELL: No, that's all we have, Mr. Examiner.

MR. STAMETS: The case will be taken under advisement.

MR. BUELL: Thank you, Mr. Examiner.

(Hearing concluded.)

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3023 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

REPORTER'S CERTIFICATE

I, SALLY WALTON BOYD, a Court Reporter, DO HEREBY CERTIFY that the foregoing and attached Transcript of Hearing before the Oil Conservation Division was reported by me; that said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability, knowledge, and skill, from my notes taken at the time of the hearing.

Sally W. Boyd C.S.R.
Sally W. Boyd, C.S.R.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 6536 heard by me on 4-25 1979.

Richard L. Stamets, Examiner
Oil Conservation Division

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

STATE OF NEW MEXICO
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BEFORE: Richard L. Stamets

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For the Oil Conservation Division: Ernest L. Padilla, Esq.
Legal Counsel for the Division
State Land Office Bldg.
Santa Fe, New Mexico 87503

For the Applicant: Guy T. Buell, Esq.
Amoco Production Company
Houston, Texas

I N D E X

JIM ALLEN

E X H I B I T S

MR. STAMETS: We'll call next Case 6530.

MR. PADILLA: Application of Amoco Production Company for unorthodox gas well locations, temporary injection of produced gas, and to vent gas, Union and Harding Counties, New Mexico.

MR. STAMETS: Call for appearances in this case.

MR. BUELL: Representing the applicant, Amoco Production Company, Guy Buell. I have one witness, Mr. Jim Allen.

MR. STAMETS: Any other appearances in this case? I'd like to have the witness be sworn, please.

(Witness sworn.)

MR. BUELL: Mr. Examiner, while Mr. Allen is taking his seat, I might make a very brief opening statement.

I'm sure you're aware of Amoco's efforts, and the efforts of others to form what we are calling the Bravo Dome CO_2 Unit in Union, Harding, and Quay Counties, in ortheastern New Mexico.

I'm also sure that you're aware that this is rather sparsely developed area. In the interest of gathering more reservoir data, Amoco is embarking upon a 20-well development program. We intend to maximize the data gathering from these wells and it's our intention to core completely

through the Tubb formation, which is the formation that is productive of CO_2.

In connection with that 20-well program, the hearing that we're having today is part and parcel of our intense desire to gather the maximum amount of data possible. And that is why we're appearing before you here today. We're, as Mr. Padilla pointed out, we're asking for approval of two unorthodox well locations. We're going to drill another well tied in with this program we'll review with you today, at an orthodox location. We're asking for authority to inject gas and we're asking for authority on a short term basis to vent CO_2 produced from one well, one of the wells in this testing program.

JIM ALLEN

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

DIRECT EXAMINATION

BY MR. BUELL:

Q. Mr. Allen, would you state your complete name, by whom you're employed, and in what capacity? And at what location, please, sir?

A. James C. Allen, Staff Petroleum Engineer with Amoco Production Company at Houston, Texas.

Q. Mr. Allen, you have appeared at previous hearing before the Oil Conservation Division, have you not?

A. Yes, sir.

Q. And your qualifications as a petroleum engineer are a matter of public record in the files of those cases before the Conservation Division?

A. Yes, sir.

MR. BUELL: May it please the Examiner, are there any questions of Mr. Allen's qualifications?

MR. STAMETS: The witness is considered qualified.

Q. (Mr. Buell continuing.) Before we go into any of the exhibits, Mr. Allen, would you like to elaborate slightly on some of the comments that I made in my opening statement, with regard to, particularly to the purpose of these tests that we're going to review today before the Examiner?

A. Yes, sir, I just, kind of briefly, as you have noted, the 20-well program was designed to collect and to get additional reservoir data by coring all 20 wells; we will be able to obtain additional reservoir parameters. This will help us in confirming our reservoir calculations. It will also help, we feel, later when we make recommendations for spacing and field rules, and the wells in which we're asking for today are in an area where some wells have

already been drilled and we do have some test data available to us, and we would like to take advantage of that to get some additional data.

Q. And all of these data will be intensely important to the continued work and the, hopefully, the formation of the Bravo Dome CO_2 Unit.

A. Yes, sir.

Q. All right, sir, I believe the notice on the docket sheet says that we have two leases involved today. Is my observation correct?

A. Yes, sir.

Q. What are those leases, Mr. Allen?

A. The State FI lease and the Heimann lease.

Q. Is there any particular reason why these two leases were selected for the program that we're proposing here today?

A. Yes, sir, on both those leases there already exist two wells that have been drilled and they have reasonably good interference test data that was run several years ago, and we feel like adding to them and using these two wells will considerably aid our analysis of the formation.

Q. Needless to say, the three wells that will be drilled in connection with the program we're here on today, they'll also be cored completely through the Tubb formation?

A. Yes, sir, they will.

Q. All right, sir. One of those leases is Amoco's State FI lease; the other is the Amoco Heimann, H-HI-M-A-N-N, Heimann lease, is that correct?

A. Yes.

Q. Which one of these would you like to start on first?

A. I really don't have any preference.

Q. Well, let's start on the State FI first. I believe that's the way we've numbered our exhibits. And in that connection, would you direct your attention to what has been identified as Amoco's Exhibit Number One and state for the record what that exhibit reflects.

A. Yes, sir, Exhibit Number One is a nine-section map showing the location of the Amoco State FI lease, being Section 36, Township 20 North, Range 33 East.

Q. That State FI lease of ours appears to be approximately a 640-acre lease.

A. Yes, sir.

Q. All right, sir, what about the -- currently how many wells does it have on it there in Section 36?

A. There are two wells on that lease, the State FI 1 and Well No. 2, and they're identified by conventional gas well symbols.

Q. If memory serves me correctly, No. 1 is a

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

producing well. It was a well that was produced in the prior interference test that was run, is that correct?

A. That's correct.

Q. And No. 2 was permitted and was used solely as an observation well?

A. That's correct.

Q. All right, sir. What do we propose to do is expansion of this area in which we conducted the prior test?

A. Yes, it is.

Q. What are we going to do to expand that area?

A. We propose to drill the State FI Well No. 3 at a location 1980 feet from the east line, 1315 from the south line, which will be 655 feet due north of Well No. 1.

Q. And while we're asking for that well to be permitted at that unorthodox location for all purposes, during this test it's going to be used as an observation well, is that correct?

A. That is correct.

Q. All right. Is the orientation of these three wells that I see on Exhibit One, is that important to -- in any way from the standpoint of gathering reservoir engineering data?

A. Yes, sir, it is.

Q. And in what way, Mr. Allen?

A. By locating a well 90 degrees apart, as these

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

are, and essentially equidistant from the producing well, we will be able to determine if permeability orientation does exist.

Our previous interference testing indicated that there was a little bit of discrepancy between our calculated log-derived BH and our performance derived porosity feet. Permeability orientation would explain this ---

Q. And that is one of the reasons that our proposed Well No. 3 is located at the unorthodox location, as we see on Exhibit One?

A. Yes, sir. This eliminates the distance that's a factor in our calculations.

Q. All right, sir. Let's go into some of the details of the test itself. Is this proposed to be a long term test or a short term test?

A. No, sir, we propose this as a short term test for no more than a period of 45 days.

Q. Again, will Well No. 1 be the producing well in this test?

A. Yes, sir, it will be.

Q. What do we propose to produce Well No. 1 at during the test interim?

A. Our plans are to produce it at a rate of 2000 cubic feet a day. Excuse me, 2000 MCFD.

Q. All right, sir, let me ask you this. What

will we be looking for? This is an interference test, as I understand it, among other things. What will be be looking for on the two observation wells?

A. We hope that we will see at least a five pound pressure drawdown at each one of the two wells. We're looking for positive signs of interference.

Q. And in your opinion, if we do observe a five pound pressure drawdown on either Wells 2 or 3, that would be indication of pressure interference and at that point the test could be terminated.

A. Yes, sir, they would be.

Q. And we're asking for 45 days purely as a maximum?

A. That's correct.

Q. And hopefully, we will not need to test for that long?

A. That's correct.

Q. All right, sir, why was the State FI selected for this very short term test, this 45 day maximum test?

A. Of the two leases that we looked at, interference was seen much sooner in the State FI than it was on the Heimann lease, and therefor we feel like we can get the data in a much shorter period of time.

Q. And since there are no facilities for saving and marketing the CO_2, it will be vented?

A. Yes, sir.

Q. And that's the reason it's going to be a short term test and immediately that we obtain the data in the way of drawdown, the well will be shut in and the venting stopped?

A. That is correct.

Q. Do you have anything else with regard to the test on the State FI lease?

A. No, sir, I don't believe so.

Q. All right. Let's turn now to the Heimann lease and in that connection let me draw your attention to what has been identified as our Exhibit Two.

What is Exhibit Two, Mr. Allen?

A. Exhibit Two is a map of the area around the Amoco Heimann lease, which shows both the unorthodox location for Well No. 5 and the proposed orthodox location for Well No. 4.

Q. All right, sir. The two existing wells are located in what section?

A. They are located in Section 3 of Township 19 North, 33 East.

Q. All right, sir, looking at all the hooks on this map, it would appear that our Heimann lease covers a very extensive area just on the portion depicted on our map.

A. Yes, sir. In fact, there's over 6000 acres indicated just on this portion of the map alone.

Q. All right, sir, where will the proposed injection well, temporary injection well, Well No. 4 be located?

A. Well No. 4 will be located 1980 feet from the west and south lines of Section 34, Township 20 North, 33 East.

Q. And that is at an orthodox location?

A. Yes, sir.

Q. And that well will be permitted as producer for all purposes, but for the purpose of this test, we will use it purely as an injection well?

A. Yes, sir.

Q. All right, sir. Do we find on the Heimann lease, as we did on the State FI, that the two existing wells are numbered 1 and 2?

A. That is correct.

Q. Again do we find that the No. 1 was permitted as a producing well and No. 2 is purely an observation well?

A. Yes, sir.

Q. All right, sir, let's talk for a moment about the location for Well No. 5. Would you state that location for the record, please?

A. Yes, sir, Well No. 5 is located 1315 feet from the west line, 660 feet from the south line, being 655

feet due east of Well No. 1.

Q. And that is also, as was the case with the additional well on the State FI lease, an unorthodox location.

A. Yes, sir, it is.

Q. Are we asking that it be approved for all purposes, even though in this particular test it will be used only as an observation well?

A. Yes, sir.

Q. We've been discussing the Heimann 1, 2, 4, and 5. What happened to No. 3?

A. Well No. 3 is located some -- it's off this map; it's about six miles north of this area.

Q. Well, the Heimann lease, it covers even a larger area than the 6000 plus acres that are on this exhibit?

A. It sure does.

Q. All right, sir. Was there any particular reason why the Heimann lease was selected for the test that we propose for it?

A. Yes, sir. There were several reasons, one reason being that during the interference test earlier run, we did not see interference near as soon on the Well No. 2 as we did not the State FI lease. Also, because of the size of the lease itself, we could locate the injection well

on the same basic lease, so we would be producing gas from the same lease and then re-injecting it on the same lease.

Q. We might point out, I believe, for the record, when we're using the word "gas" throughout this hearing, really we're talking about CO_2.

A. Yes, sir, we are.

Q. Gotcha, we use the words synonymously?

A. Yes, sir.

Q. Why was it necessary to locate this temporary injection well so far from the three control wells in the test area?

A. There are two main reasons, the first being that we felt we needed to locate the injection well at sufficient distance that it will not cause any disruptions in the test data that were in the interference test.

Q. And if it were any closer than this some mile and a half, mile and a third, the very injection of the CO_2 back into the Tubb might distort the interference data that you were attempting to gather on your observation well?

A. Yes, sir, we feel it could.

Q. Or you could say it would interfere with the interference data?

A. Yes, sir.

Q. All right, sir, since our temporary injection

well, Well No. 4, is not drilled as yet, you can't have a log on it. Do you have a log on a well in this immediate area?

A. Yes, sir, I have a copy of the gamma ray neutron density log run on the Heimann Well No. 2, which is the closest existing well to our proposed Well No. 4.

Q. Mr. Allen, that's been identified as our Exhibit Number Three. Do you have any comments to make on that exhibit?

A. Only that we have noted on the log at a depth of approximately 2340 feet, we've shown the top of the Tubb formation and the base of it. I've also indicated the perforated interval within this wellbore.

Q. The No. 2 Well is an observation well but an observation well can't observe unless it's open to the formation either through open hole or by perforations, is that correct?

A. Yes, sir.

Q. Would you anticipate that the log characteristics on our No. 4 when it is drilled will be very similar to our Exhibit Number Three?

A. Yes, sir, I do.

Q. All right, sir, do you have any other comments on Exhibit Three?

A. No, sir, I don't believe so.

Q. Turn your attention then if you would very quickly and very briefly to what has been identified as our Exhibit Four. What is that exhibit?

A. Exhibit Number Four is a proposed wellbore sketch at the Heimann Well No. 4, which would be used as a temporary injection well. It shows the casing strings we propose to run and the cementing program.

Also, I would like to note that in this particular wellbore it shows that we will top-set the Tubb and drill open hole into the Tubb formation, the reason being here is that we would like to obtain a native state core using air as the coring fluid.

Q. All right, sir, any other comments on Exhibit Four?

A. No, sir.

Q. Exhibit Five is another wellbore sketch of the proposed completion on our No. 5, the unorthodox location in Section 3. Would you briefly comment on it, Mr. Allen?

A. Yes, sir. This exhibit shows the same information as the previous one did. I will note, however, that we do plan a case through completion on Well No. 5 as opposed to an open hole completion.

Q. All right. Look now, if you would, at our Exhibit Six. What is that exhibit?

A. Exhibit Number Six is the wellbore sketch of the Heimann Well No. 2 as it now exists, which is the closest well to the proposed injection well.

Q. And Exhibit Seven? What is it?

A. Exhibit Number Seven is the same data for the Heimann Well No. 1, which will be the producing well in this interference test program.

Q. All right, sir, now let's go back and look for a minute at Exhibit Two, and particularly the well in Section 3 where our test will be conducted.

Is the orientation geographically of those wells as critical here as it was on our State FI lease?

A. Yes, sir, it is. We hope to obtain the same type of information. If there is a permeability orientation we would like to know it.

Q. And with the two observation wells each at a 90 degree angle from the producing wells, the data that you've covered on the State FI should also be revealed from this test?

A. That is correct.

Q. All right, sir. Let's go into the test itself now. Is this going to be a short term test, such as we proposed on the State FI?

A. No, sir, it's not. We propose to conduct this test for a period of six months.

Q. All right, sir, and during that six month test period, what producing rate is planned for the producing well, the No. 1 Well?

A. We propose to produce at a rate of a million cubic feet a day.

Q. All right, sir, and all the CO_2 produced from the No. 1 Heimann will be injected back into the No. 4 in the section to the north?

A. Yes, sir, it will be.

Q. So it will not be vented?

A. That's correct.

Q. All right, sir. What do we hope to gain from a long term test that we couldn't realize from, say, a short term test?

A. Well, one of the things that we should be able to obtain from this test is that by running a long term flow test we will be able to evaluated the reservoir parameters in Well No. 1 much better in that the pressure transit will continue to move over this period of time, so we will be able to investigate deeper into the reservoir for reservoir parameters.

In addition, the six month period will allow us to field test our surface producing -- or handling facilities which we will need when wide scale development, our gathering line is built.

Q. Well, actually, Mr. Allen, we've known about CO_2 being in this area for some time, and other than some small isolated CO_2 production that I believe it served a bottling company, Coca Cola, or something like that, there has been very little CO_2 production.

A. I believe that's correct.

Q. So six months deliverability from this No. 1 Well will be of extreme benefit, not just to Amoco, but all the others that are interested in forming the Bravo Dome CO_2 Unit.

A. That is correct. One of the factors that we will get here that I failed to mention that we won't on the other one, is that we will get an idea of what the long term deliverability of these wells may be like. It will help, I think, considerably in our determination of spacing at a latter date.

Q. All right, sir, you also mentioned that surface facilities in connection with our Heimann test, on the State FI we had no surface facilities involved, did we, other than the wellhead?

A. That's correct.

Q. All right, sir, let me direct your attention to what has been identified as our Exhibit Number Eight. What is that exhibit?

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3020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

A. Exhibit Number Eight is just a simple schematic diagram which illustrates the equipment that will be tested during the six months period.

Q. First, let's cover this all very briefly, Mr. Allen, but I guess the first thing we ought to discuss, you're going to need the line, I'll call it a flow line, to get the produced CO_2 from the No. 1 Well up to the No. 4 Well to the north to be injected, is that correct?

A. Yes, sir, this injection line will be a two and a half inch steel line, one half of which will be internally plastic coated for corrosion protection; the other half which will be bare steel, but we will use a corrosion inhibitor for inhibition.

Q. Is the general path of that flow line shown on the Examiner's copy of Exhibit Two with what appears to be a brilliant burnt orange effect?

A. Yes, sir, it is; obnoxious color.

Q. All right, sir, let me ask you this, why do we have half of this flow line internally plastic coated and half of it just a regular two and a half inch flow line?

A. One of the things we can learn by doing this is that we can evaluate the friction loss in these two segments of pipe. If there is significant difference, then it could aid us in sizing the gathering system line, and it

could result in significant savings in an area of this magnitude.

Q. If the Bravo Dome Unit, as we contemplate it now, becomes a reality, there will be a tremendous flow lines, installation of that type, that will be necessary to connect the producing wells to get the CO_2 to market, will there not?

A. Yes, sir.

Q. Do you feel that these data that we'll obtain during this six month test will be invaluable as far as sizing and designing the ultimate gathering system and flow lines from the Bravo Dome Unit?

A. Yes, I think it will be very helpful.

Q. All right, sir, looking at your chart, starting at the left and moving to the right, first thing you show on the flow diagram is the separator. Do you want to comment on that?

A. Yes, sir, the separator will be, as will the other equipment, be an off-the-shelf type item. There will be no special alloys in it. We will be testing in this operation the effectiveness of various corrosion inhibitors.

Q. A tremendously large proponderance of the wells -- the fluid, is CO_2, is it not?

A. Yes, sir, it is.

Q About what percentage is it, incidentally, and I realize this would be on the average?

A. About 99 and a half, or better, 99.7, maybe, CO_2.

Q But there is a moisture that comes up with the CO_2 stream?

A. Yes, sir, there is some.

Q And the separator will get after that?

A. Yes, sir, it will.

Q All right, sir, moving to the right on your flow chart, I see compressor. Comment on compressor.

A. Again, the compressor will be an off-the-shelf type item. We will be evaluating, too, the effectiveness of corrosion inhibition to see if we can successfully use compressors out of relatively standard equipment or whether we would have to go to more exotic and expensive stainless steel type.

Q All right, sir, moving on the right on the flow chart I see dehydrator. Would you comment on dehydrator?

A. Yes, sir, this may be one of the more important items on here, in that we have a contract now with Rice University to determine the best type of glycol, which would be -- well, the best type, most effective, and the most economical, to use in the drying of CO_2, and this would give

us an opportunity, then, to field test the results that they obtain in the laboratory.

Q. I can't help but wonder, Mr. Allen, I see compressor on your flow chart; I know we're going to return the CO_2 back to the Tubb; will this be a high pressure system that we're looking at on your Exhibit Eight?

A. No, sir, the compressor design is for a rate of a million a day at 360 pounds injection pressure.

Q. Relatively low pressure when we're thinking of pressure?

A. Yes, sir, it is, and there'll be even probably less pressure than that on the flow line.

Q. Mr. Allen, whether or not the Bravo Dome CO_2 Unit is formed, and we all sincerely hope it will be, but whether or not it is formed, there will still be a probably significant and tremendous development program in this area of CO_2 wells.

A. Yes, sir, I would think so.

Q. Do you feel that these tests will be of benefit not only just to Amoco but the other lessors and operators in the area from the standpoint of when this development time comes, either unitized or competitive, will be of tremendous benefit in not only designing the surface facilities but also in arriving at the proper and effective de-

velopment pattern that will be required to produce the CO_2 and get it to market?

A. Yes, sir, I think the information would be invaluable, particularly in light of the spacing.

Q. Well, then do you feel that the data we will obtain if these test programs are approved that we're asking for here today, will serve conservation in that they will provide additional data upon which we and other operators can plan a sound development program, both from the standpoint of recovering the maximum amount of CO_2, as well as doing it in the most economic fashion and preventing economic waste?

A. Yes, sir. In fact, it very well could result in the prevention of a lot of unnecessary wells being drilled.

Q. Do you have anything else you'd care to add at this time, Mr. Allen?

A. No, sir, I don't believe so.

MR. BUELL: May it please the Examiner, that's all we have by way of direct. I would like to formally offer our Exhibits One through Eight, inclusive.

MR. STAMETS: These exhibits will be admitted.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Allen, on the No. 4 Heimann injection well, will you monitor that -- the annulus in that hole for any failure of your injection tubing?

A. Mr. Examiner, I'm sure that we will be.

Q. Do you know offhand how you plan to do that? You're just going to leave an annular space open in this well?

A. Our normal procedure any time we use a packer is to load the annular space behind the tubing with a corrosion inhibitor type fluid. I see no reason why we would not follow that standard procedure.

Q. Okay, and then what about the tubing in the injection wells? Is it going to be standard tubing or lined?

A. I believe that as it's proposed it will probably be standard in this test.

Q. In a short term test like this is it going to make any difference?

A. I don't believe that it would. The fluid should not be, particularly on this test, should not be corrosive, or too corrosive, since it will be downstream of the dehydrator, and CO_2 is not particularly corrosive unless it does have water in it, considerable moisture.

Q. Have you checked with the State Land Office and the Oil and Gas Accounting Commission to see if they are going to require payment of royalties and taxes on this flared gas?

A. No, sir, I have not.

Q. Do you have a plan to do that?

MR. BUELL: May it please the Examiner, no, sir, at this time we do not plan to. We certainly not trying to keep it a secret from them, and if you feel that it's adviseable, we'll be happy to.

This State FI lease was involved in our previous test and at that time, also, the gas was vented.

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

Anything further in this case?

MR. BUELL: No, that's all we have, Mr. Examiner.

MR. STAMETS: The case will be taken under advisement.

MR. BUELL: Thank you, Mr. Examiner.

(Hearing concluded.)

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

REPORTER'S CERTIFICATE

I, SALLY WALTON BOYD, a Court Reporter, DO HEREBY CERTIFY that the foregoing and attached Transcript of Hearing before the Oil Conservation Division was reported by me; that said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability, knowledge, and skill, from my notes taken at the time of the hearing.

Sally W. Boyd, C.S.R.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. _____, heard by me on _____ 19____.

_____, Examiner
Oil Conservation Division

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

CASE NO. 6530
Order No. R-6002

APPLICATION OF AMOCO PRODUCTION COMPANY FOR UNORTHODOX GAS WELL LOCATIONS, TEMPORARY INJECTION OF PRODUCED GAS AND TO VENT GAS, UNION AND HARDING COUNTIES, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on April 25, 1979, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 2nd day of May, 1979, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Amoco Production Company, seeks approval of unorthodox gas well locations in the Tubb formation for its State FI Well No. 3 to be located 1315 feet from the South line and 1980 feet from the East line of Section 36, Township 20 North, Range 34 East, NMPM, Union County, New Mexico, and its Heimann Well No. 5 located 660 feet from the South line and 1315 feet from the West line of Section 3, Township 19 North, Range 33 East, NMPM, Harding County, New Mexico.

(3) Applicant further seeks authority to conduct pressure interference tests, including authority to vent gas produced

from the State FI Well No. 1 for a period not to exceed 45 days, to produce its Heimann Well No. 1 located in Unit M of Section 3, Township 19 North, Range 33 East, NMPM, and to reinject the produced gas into its Heimann Well No. 4 located in Unit K of Section 34, Township 20 North, Range 33 East, for a period not to exceed six months.

(4) That such interference tests will permit the applicant to evaluate the Tubb carbon dioxide reservoir to determine the most efficient and economic spacing pattern and to test and evaluate production and gathering equipment.

(5) That the proposed unorthodox locations are to permit the completions of wells at optimum locations for use during the interference tests.

(6) That the applicant should notify the Supervisor of the Division's district office at Santa Fe of the date and time that said interference tests shall commence.

(7) That no offset operator objected to the proposed unorthodox locations.

(8) That approval of the subject application will afford the applicant the opportunity to gather engineering and reservoir data which should serve to prevent the economic loss caused by the drilling of unnecessary wells, avoid the augmentation of risk arising from the drilling of an excessive number of wells, and otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That unorthodox gas well locations for the Tubb formation are hereby approved for the Amoco Production Company State FI Well No. 3 to be located 1315 feet from the South line and 1980 feet from the East line of Section 36, Township 20 North, Range 34 East, NMPM, Union County, and the Heimann Well No. 5 to be located 660 feet from the South line and 1315 feet from the West line of Section 3, Township 19 North, Range 33 East, NMPM, Harding County, New Mexico.

(2) That the applicant is further granted authority to conduct pressure interference tests, including authority to vent gas produced from its State FI Well No. 1 at a rate not to exceed 2000 MCF per day for a period not to exceed 45 days and to produce its Heimann Well No. 1 located in Unit M of

Section 3, Township 19 North, Range 33 East, NMPM, and to reinject the produced gas into its Heimann Well No. 4 located in Unit K of Section 34, Township 20 North, Range 33 East, NMPM, for a period not to exceed six months.

(3) That the applicant shall notify the supervisor of the Division's district office at Santa Fe of the date and time that such interference tests shall commence.

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

S E A L

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

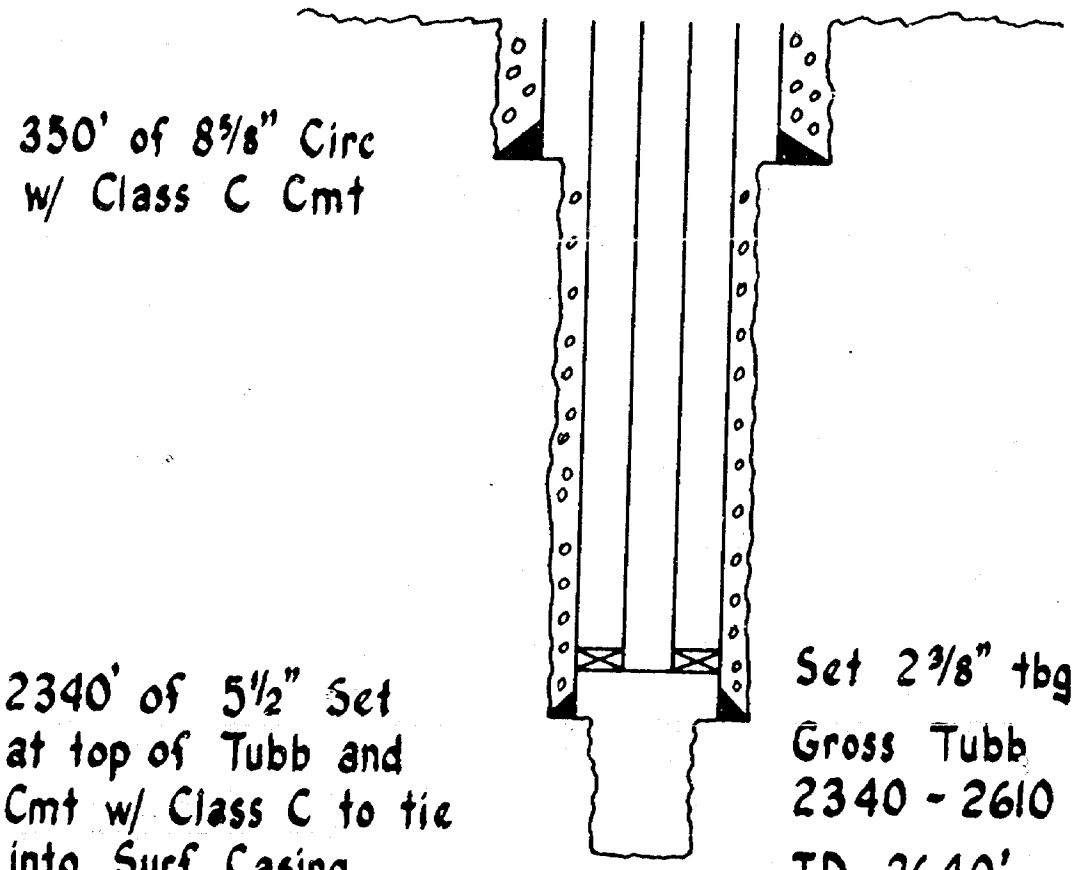
JOE D. RAMEY,
Director

dr/

Heimann No. 4

Elev. 4969 RDB (est)

(All depths are estimated as well has not been drilled)



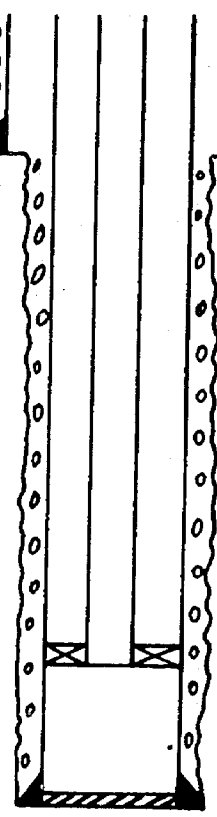
BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
Amoco EXHIBIT NO. 4
CASE NO. 6530
Submitted by Amoco
Hearing Date 4-25-79

Heimann No. 5

Elev. 4969 RDB (est)

(All depths are estimated as well has not been drilled)

350' of 8 5/8"
Circ w/ Class C Cmt.



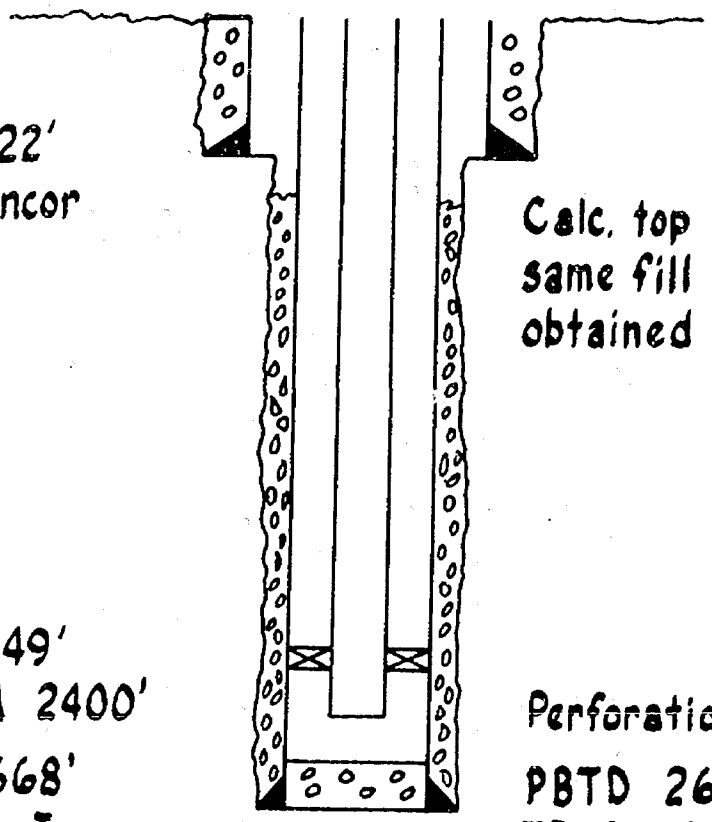
Set 2 3/8" tbg in pkr
Gross Tubb Interval
2340 - 2615
TD 2645'

2645' of 4 1/2"
Cmt w/ Class C to
tie into surf. casing

BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
Amoco EXHIBIT NO. 5
CASE NO. 6530
Submitted by Allen
Hearing Date 4-25-79

Heimann No. 1

Elev. 4969 RDB



8⅝" CSA 322'
w/ 160 SX Incor

Calc. top of Cmt 378' using same fill efficiency as that obtained at Heimann No. 2

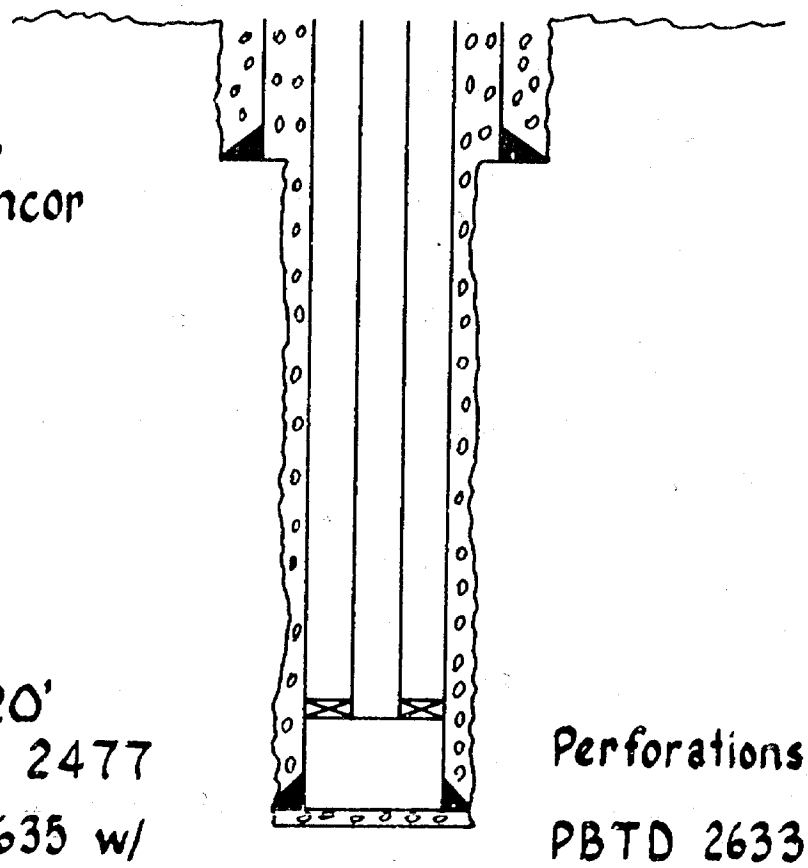
Pkr SA 2349'
2⅜" Tbg SA 2400'
4½" CSA 2668'
w/ 550 SX Incor

Perforations 2370 - 2478
2484 - 2493
PBTD 2623
TD 2668

BEFORE THE OIL CONSERVATION DIVISION
Amoco EXHIBIT NO. 6
CASE NO. 6530
Submitted by Allen
Hearing Date 4-25-79

Heimann No. 2

Elev. 4969 RDB



8⅝" CSA 356
w/ 200 SX Incor

Pkr. SA 2320'
2⅜" Tbg SA 2477

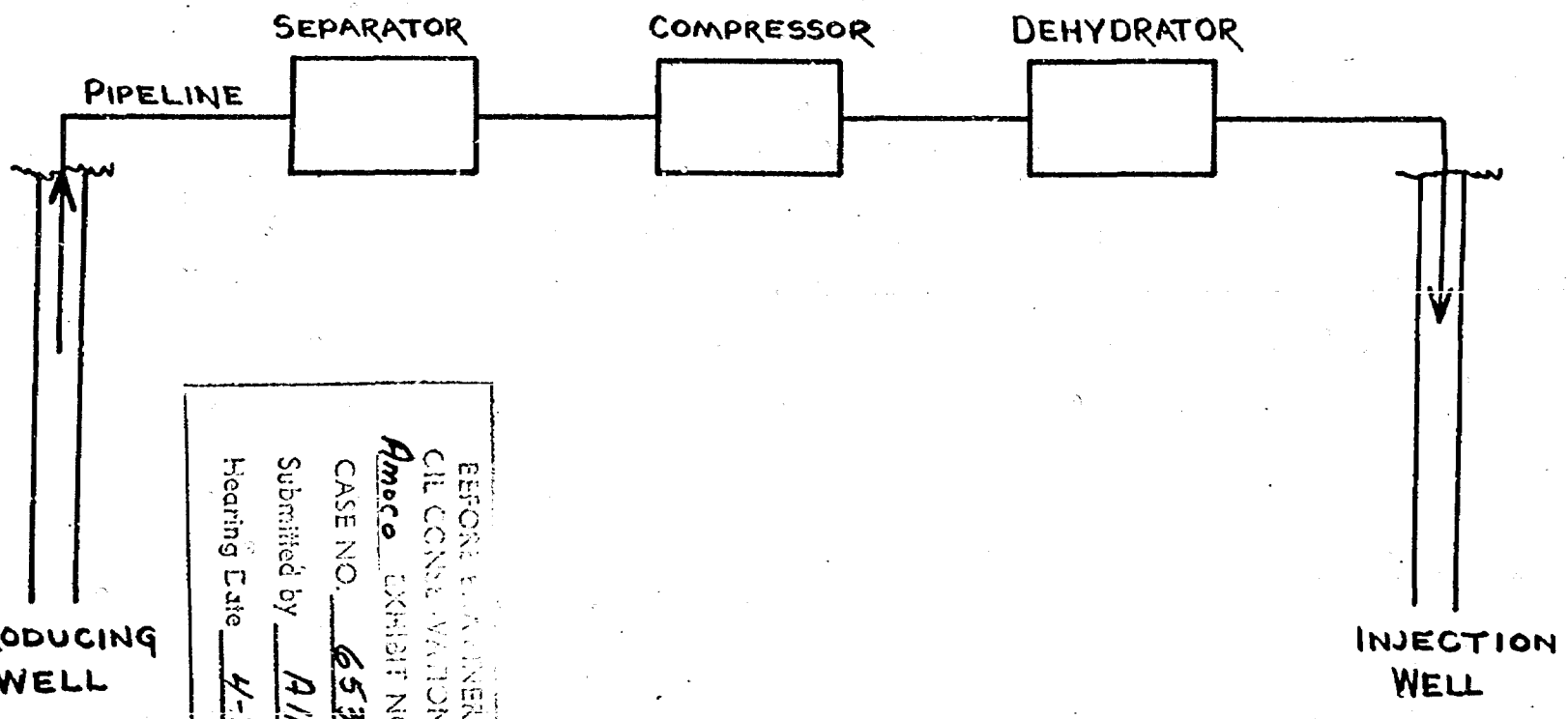
4½" CSA 2635 w/
650 SX Class C
Cmt Circ to Surface

Perforations 2350-2479

PBTD 2633
TD 2660

BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
Amoco EXHIBIT NO. 7
CASE NO. 6530
Submitted by Amoco
Hearing Date 4-25-79

BRAVO DOME WELL & EQUIPMENT TEST



BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
Amoco EXHIBIT NO. 8
CASE NO. 6530
Submitted by Allen
Hearing Date 4-25-79

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

JERRY APODACA
GOVERNOR

NICK FRANKLIN
SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

May 2, 1979

Re: CASE NO. 6530
ORDER NO. R-6002

Mr. Guy Buell
Attorney
Amoco Production Company
P. O. Box 3092
Houston, Texas 77001

Applicant:

Amoco Production Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced Division order recently entered in the subject case.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

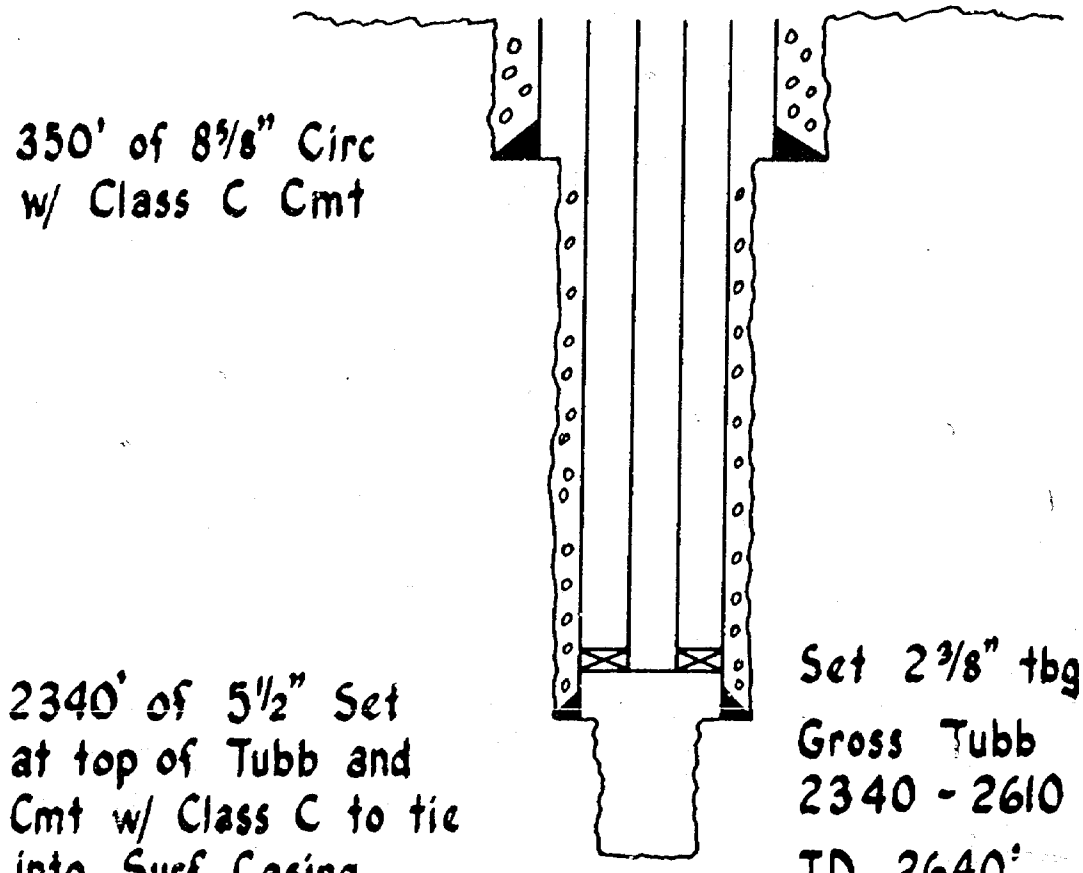
Hobbs OCC x
Artesia OCC x
Aztec OCC

Other

Heimann No. 4

Elev. 4969 RDB (est)

(All depths are estimated as well has not been drilled)

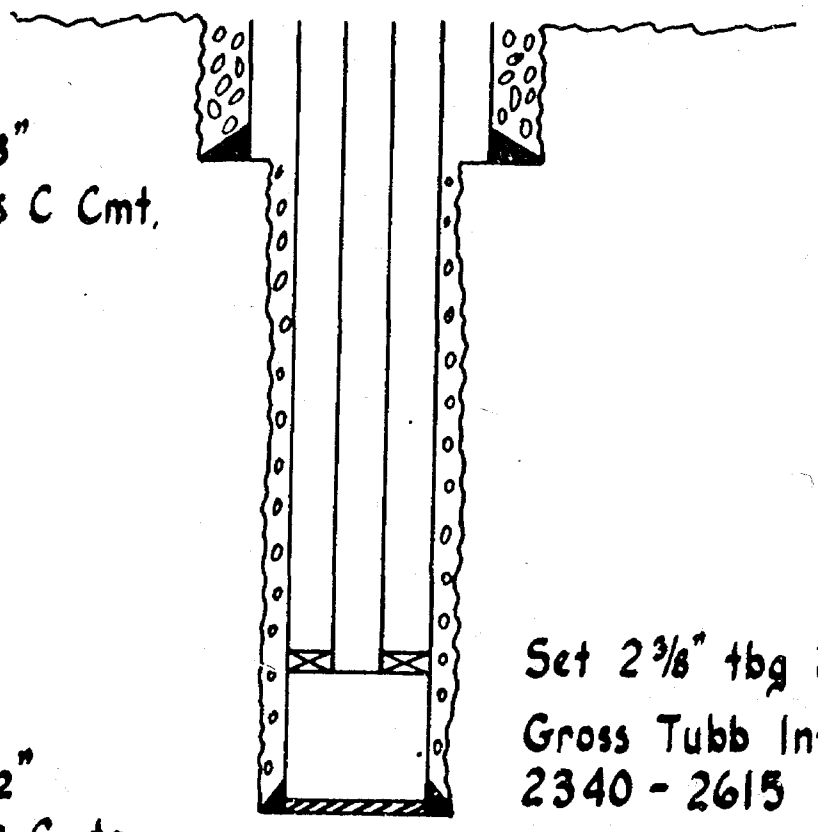


BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
Amoco EXHIBIT NO. 4
CASE NO. 6530
Submitted by Allen
Hearing Date 4-25-79

Heimann No. 5

Elev. 4969 RDB (est)

(All depths are estimated as well has not been drilled)



350' of 8 5/8"
Circ w/ Class C Cmt.

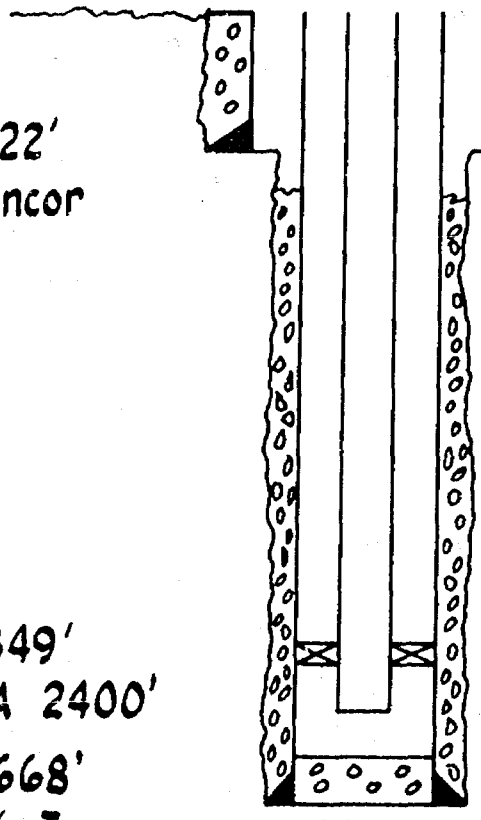
2645' of 4½"
Cmt w/ Class C to
tie into surf. casing

Set 2 3/8" tbg in pkr
Gross Tubb Interval
2340 - 2615
TD 2645'

BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
Amoco EXHIBIT NO. 5
CASE NO. 6530
Submitted by Allen
Hearing Date 4-25-79

Heimann No. 1

Elev. 4969 RDB



8⅝" CSA 322'
w/ 160 SX Incor

Calc. top of Cmt 378' using same fill efficiency as that obtained at Heimann No. 2

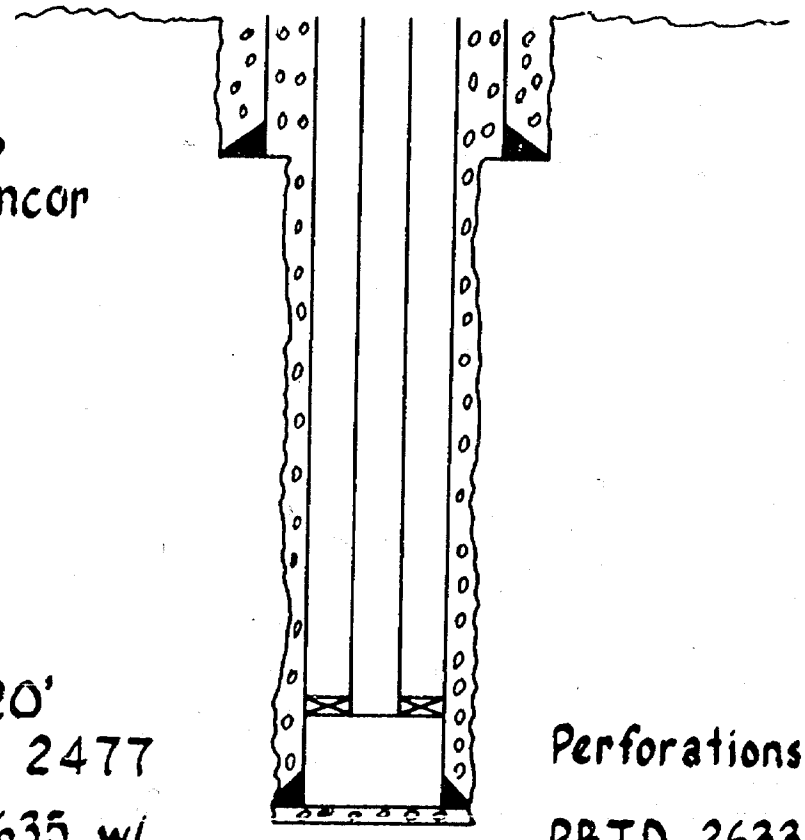
Pkr SA 2349'
2⅜" Tbg SA 2400'
4½" CSA 2668'
w/ 550 SX Incor

Perforations 2370 - 2478
2484 - 2493
PBTD 2623
TD 2668

BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
Amoco EXHIBIT NO. 6
CASE NO. 6530
Submitted by Allen
Hearing Date 4-25-79

Heimann No. 2

Elev. 4969 RDB



8⅝" CSA 356
w/ 200 SX Incor

Pkr. SA 2320'
2⅜" Tbg SA 2477

4½" CSA 2635 w/
650 SX Class C
Cmt Circ to Surface

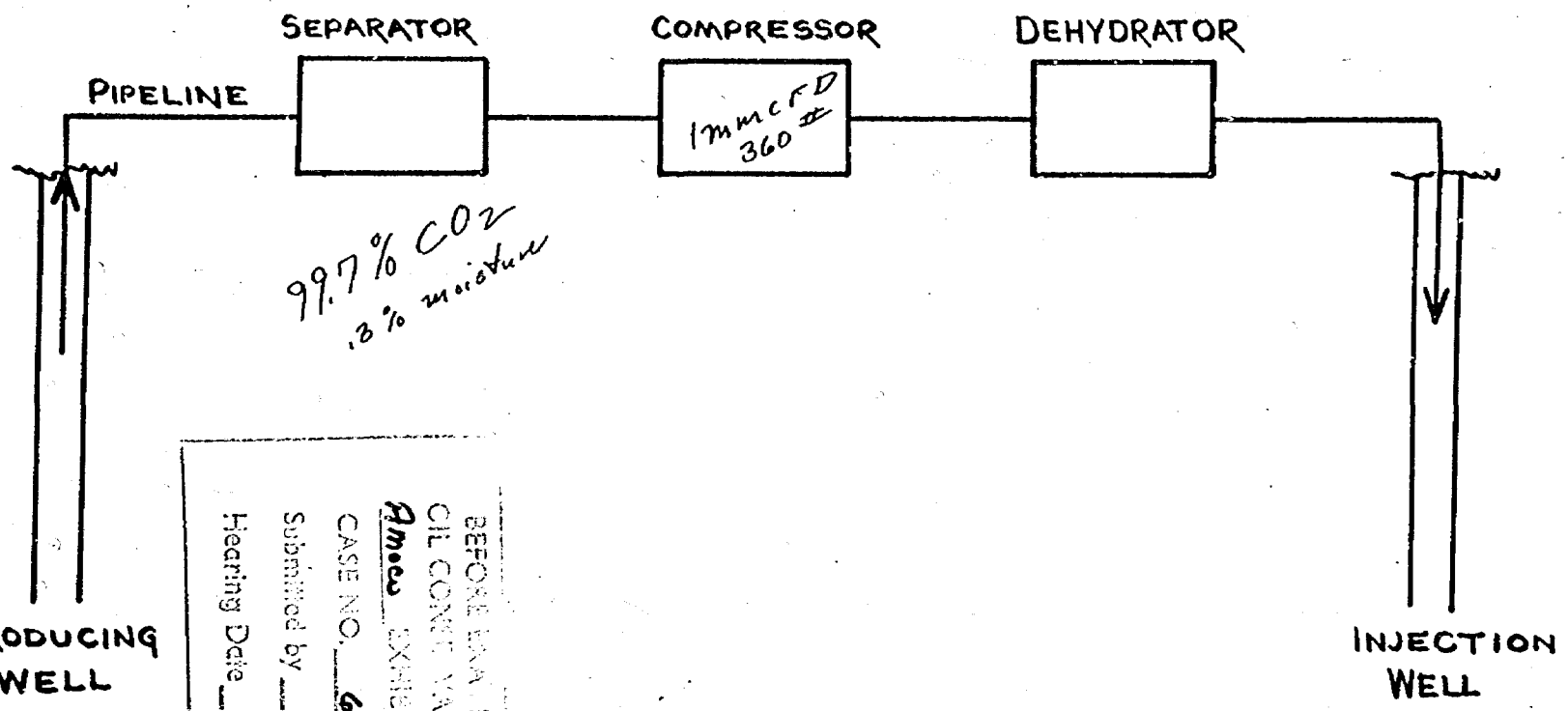
Perforations 2350-2479

PBTD 2633
TD 2660

BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
Amoco EXHIBIT NO. 7
CASE NO. 6530
Submitted by Amoco
Hearing Date 4-25-79

1

BRAVO DOME WELL & EQUIPMENT TEST



BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
Amoco EXHIBIT NO. 13
CASE NO. 6530
Submitted by Allen
Hearing Date 4-25-79

BEFORE THE OIL CONSERVATION DIVISION

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF AMOCO PRODUCTION COMPANY FOR UNORTHODOX GAS WELL LOCATIONS, TEMPORARY INJECTION OF PRODUCED GAS, AND TO VENT GAS, SECTION 36, TOWNSHIP 22, NORTH, RANGE 34 EAST, UNION COUNTY, AND SECTION 3, TOWNSHIP 19 NORTH, RANGE 33 EAST, HARDING COUNTY, AND TO VENT GAS AND INJECTION PRODUCED GAS, SECTION 34, TOWNSHIP 20 NORTH, RANGE 33 EAST.	)	No. 6530

ENTRY OF APPEARANCE

The undersigned hereby enter their appearance on behalf of Amoco Producetion Comapny with Guy Buell and Richard Merrill of Houston, Texas.

ATTWOOD, MALONE, MANN & COOTER, P.A.

By _____

Post Office Drawer 700
Roswell, New Mexico 88201

Dockets Nos. 18-79 and 20-79 are tentatively set for hearing on May 9 and 23, 1979. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - APRIL 25, 1979

9 A.M. - OIL CONSERVATION DIVISION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner:

CASE 6525: In the matter of the hearing called by the Oil Conservation Division on its own motion to amend the Special Rules for the Tubb Gas Pool in Lea County, New Mexico, to provide for the classification of wells as oil wells and gas wells on the basis of gas-oil ratios rather than on the basis of liquid gravity as at present.

CASE 6526: In the matter of the hearing called by the Oil Conservation Division on its own motion to consider a procedure for the adoption of findings, when applicable and pursuant to the Federal Natural Gas Policy Act, that another well is necessary to effectively and efficiently drain that portion of its proration unit which cannot be so drained by any existing well, and that existing well spacing requirements are waived. The proposed procedure would provide a system whereby such findings could be issued administratively without the necessity for public hearing.

CASE 6527: Application of Tenneco Oil Company for two non-standard oil proration units, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of two 80-acre non-standard oil proration units, the first comprising the N/2 NW/4, the other the N/2 NE/4, of Section 12, Township 9 South, Range 34 East, Vada-Pennsylvanian Pool, Lea County, New Mexico, said units to be dedicated to applicant's Ward Insall Wells Nos. 1 and 2, respectively, located in Units D and A of said Section 12.

CASE 6528: Application of Bass Enterprises Production Co. for an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for an unorthodox Morrow test well location to be drilled 660 feet from the North and West lines of Section 10, Township 21 South, Range 32 East, Lea County, New Mexico, the W/2 of said Section 10 to be dedicated to the well.

CASE 6529: Application of Amoco Production Company for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the S/2 of Section 22, Township 23 South, Range 28 East, Eddy County, New Mexico, to be dedicated to its Brantley Gas Com. Well No. 1 located in Unit K of said Section 22. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6530: Application of Amoco Production Company for unorthodox gas well locations, temporary injection of produced gas, and to vent gas, Union and Harding Counties, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox locations in the Tubb formation of its State FI Well No. 3, located 1315 feet from the South line and 1980 feet from the East line of Section 36, Township 20 North, Range 34 East, Union County, and its Heimann Well No. 5, located 660 feet from the South line and 1315 feet from the West line of Section 3, Township 19 North, Range 33 East, Harding County. Applicant further seeks authority to conduct pressure interference tests, including authority to vent gas produced from the State FI Well No. 1 for a period not to exceed 45 days and to inject produced gas into its Heimann Well No. 4 located in Unit K of Section 34, Township 20 North, Range 33 East, for a period not to exceed six months.

CASE 6531: Application of Getty Oil Company for an unorthodox gas well location and simultaneous dedication, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to simultaneously dedicate its Baker B Well No. 6 at an unorthodox location 510 feet from the South and West lines of Section 10, Township 22 South, Range 37 East, Lea County, New Mexico, and its Baker B Well No. 15 located in Unit L of said Section 10, the current unit well, to the existing proration unit.

CASE 6532: Application of Northwest Production Corporation for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Tapacito-Pictured Cliffs and Blanco Mesaverde production in the wellbore of its Jicarilla 117E Well No. 5 located in Unit M of Section 28, Township 26 North, Range 3 West, Rio Arriba County, New Mexico.

CASE 6072: (Continued from March 28, 1979, Examiner Hearing)

In the matter of Case 6072 being reopened pursuant to the provisions of Order No. R-5643 which order created the Travis-Upper Pennsylvanian Pool, Eddy County, New Mexico, with provisions for 80-acre spacing. All interested parties may appear and show cause why the Travis-Upper Pennsylvanian Pool should not be developed on 40-acre spacing units.

Dan Nutter

applicant further seeks authority to conduct pressure interference tests, including authority to vent gas produced from the State FI Well No 1 for a period not to exceed 45 days and to inject produced gas into its Hinman Well No. 4 located in Unit K of Section 34, Township 20 North Range 33 East, for a period not to exceed six months.

Amoco Production Company

March 23, 1979

File: TBM-986.51-1467

Re: Application for Hearing
Unorthodox Gas Well Location
Temporary Exception to Rule 404
to Vent CO_2 and Permit for Temporary
Injection of CO_2 (Rule 701).

Case 6530

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. Joe D. Ramey (3)

Gentlemen:

Amoco Production Company respectfully requests a hearing to consider our application to drill two gas wells for CO_2 from the Tubbs Formation at a total depth of approximately 2800'. The unorthodox location for each of these two wells are as follows:

State FI Well No. 3
1980' FEL x 1315' FSL
Sec. 36, T-20-N, T-34-E
Union Co., New Mexico

Heimann Well No. 5
1315 FWL x 660' FSL
Sec. 3, T-19-N, R-33-E
Harding Co., New Mexico

The State FI Well No. 3 will be used as an observation well in conducting reservoir testing of the Tubbs formation to collect additional engineering data. We also, therefore, request an exception to statewide Rule 404(a) to allow producing the State FI Well No. 1 for a period not to exceed 45 days and venting the gas during this period.

Amoco Production Company further requests approval for injecting CO_2 which will be produced from the Heimann Well No. 1 into the Heimann Well No. 4 for a period not to exceed 6 months. The Heimann Well No. 4 will be drilled at an orthodox location of 1980' FWL x 1980' FSL of Sec. 34, T-20-N, R-33-E, Harding County, New Mexico. Heimann Wells Nos. 2 and 5 will be observation wells in conducting this long-term testing of the Tubbs formation.

Attached are three copies each of location plats for the two wells requiring approval of an unorthodox location. Also shown on the plats are existing wells in the immediate vicinity of each well, including the wells to be produced during the testing and the proposed CO_2 injection well.

Please place this item on the Examiner's Hearing Docket of April 18, 1979, or the next hearing docket thereafter.

Any questions concerning this request should be directed to Mr. Jim Allen (713/652-5497).

Yours very truly,

J. R. Barnett

JCA/dgh
47K

Attachments

Bcc: V. E. Staley - Levelland
G. T. Buell - Building
B. A. Landis - Building
D. R. Currens - Building
L. J. Sanders - Building

Amoco Production Company

March 23, 1979

File: TBM-986.51-1467

Re: Application for Hearing
Unorthodox Gas Well Location
Temporary Exception to Rule 404
to Vent CO_2 and Permit for Temporary
Injection of CO_2 (Rule 701).

Case 6530

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
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Santa Fe, New Mexico 87501

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Union Co., New Mexico

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1315 FWL x 660' FSL
Sec. 3, T-19-N, R-33-E
Harding Co., New Mexico

The State FI Well No. 3 will be used as an observation well in conducting reservoir testing of the Tubbs formation to collect additional engineering data. We also, therefore, request an exception to statewide Rule 404(a) to allow producing the State FI Well No. 1 for a period not to exceed 45 days and venting the gas during this period.

Amoco Production Company further requests approval for injecting CO_2 which will be produced from the Heimann Well No. 1 into the Heimann Well No. 4 for a period not to exceed 6 months. The Heimann Well No. 4 will be drilled at an orthodox location of 1980' FWL x 1980' FSL of Sec. 34, T-20-N, R-33-E, Harding County, New Mexico. Heimann Wells Nos. 2 and 5 will be observation wells in conducting this long-term testing of the Tubbs formation.

Attached are three copies each of location plats for the two wells requiring approval of an unorthodox location. Also shown on the plats are existing wells in the immediate vicinity of each well, including the wells to be produced during the testing and the proposed CO_2 injection well.

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Yours very truly,

J. R. Barnett

JCA/dgh
47K

Attachments

Bcc: V. E. Staley - Levelland
G. T. Buell - Building
B. A. Landis - Building
D. R. Currens - Building
L. J. Sanders - Building

ROUGH

dr/

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 6530

Order No. R-6007

APPLICATION OF AMOCO PRODUCTION
COMPANY FOR UNORTHODOX GAS WELL LOCATIONS,
TEMPORARY INJECTION OF PRODUCED GAS AND TO
VENT GAS, UNION AND HARDING COUNTIES,
NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on April 25, 19 79, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this _____ day of May, 19 79, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Amoco Production Company, seeks approval of ~~an~~ unorthodox gas well locations in the Tubb formation for its State FI Well No. 3 to be located 1315 feet from the South line and 1980 feet from the East line of Section 36, Township 20 North, Range 34 East, NMPM, Union County, New Mexico, and its

Heimann Well No. 5 located 660 feet from the South line and 1315 feet from the West line of Section 3, Township 19 North, Range 33 East, NMPM, Harding County, New Mexico.

(3) Applicant further seeks authority to conduct pressure interference tests, including authority to vent gas produced from the State FI Well No. 1 for a period not to exceed 45 days, to produce its Heimann Well No. 1 located in Unit M of Section 3, Township 19 North, Range 33 East, NMPM, and to inject produced gas into its Heimann Well No. 4 located in Unit K of Section 34, Township 20 North, Range 33 East, for a period not to exceed six months.

(4) That such interference tests will permit the applicant to evaluate the Tubb Carbon dioxide reservoir to determine the most efficient and economic spacing pattern and to test and evaluate production and gathering equipment.

(5) ~~That the evidence such interference tests~~ That the data derived from such interference tests should be

(5) That the proposed unorthodox locations are to permit the completions of wells at optimum locations for use during the interference tests.

(6) That the applicant should notify the Supervisor of the Division's District Office at Santa Fe of the date and time that said interference tests shall commence.

(7) That no offset operator objected to the proposed unorthodox locations.

(8) That approval of the subject application will afford the applicant the opportunity to ~~produce its just and equitable share of the gas in the subject pool, will~~ gather engineering and reservoir data which should serve to prevent the economic loss caused by the drilling of unnecessary wells, avoid the augmentation of risk arising from the drilling of an excessive number of wells, and ~~will~~ otherwise prevent waste and protect

correlative rights.

IT IS THEREFORE ORDERED:

(1) That unorthodox gas well locations for the Tubb formation are hereby approved for the Amoco Production Company State FI Well No. 3 to be located 1315 feet from the South line and 1980 feet from the East line of Section 36, Township 20 North, Range 34 East, NMPM, Union County, and the Heimann Well No. 5 to be located 660 feet from the South line and 1315 feet from the West line of Section 3, Township 19 North, Range 33 East, NMPM, Harding County, New Mexico.

The applicant is further granted

(2) That authority ~~is also given~~ to conduct pressure interference tests, including authority to vent gas produced at a rate not to exceed 2,000 MCF per day from ~~the~~ its State FI Well No. 1 for a period not to exceed 45 days and to produce the Heimann Well No 1 located in Unit M of Section 3, Township 19 North, Range 20 East, NMPM, and to inject produced gas into its Heimann Well No. 4 located in Unit K of Section 34, Township 20 North, Range 33 East, NMPM, for a period not to exceed six months.

(3) That the _____ of said Section 36 and the _____ of said Section 3 are to be dedicated to the above-described wells.

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

(3) That the applicant shall notify the supervisor of the Division's district office at Santa Fe of the date and time that such interference tests shall commence