

to be a development that the location was wrong, so I personally went out there and resurveyed it and made the second certified plat as to the location.

MR. McCORMICK: How far is it from the west line of that forty?

A. 115 feet.

MR. GRAHAM: Are there any other wells on that same forty?

A. No, sir.

MR. SHEPARD: Is there any wells on the forty to the west of it?

A. No, sir, there isn't yet.

MR. SHEPARD: And the northwest of the northeast is owned by Jones and Watkins?

MR. JONES: So far as I know, yes, sir.

MR. SHEPARD: Thank you.

GOVERNOR MABRY: Anybody have anything to offer in this case on this docket?

MR. NEWMAN: Justin B. Newman, of the Oil Conservation Commission. When Mr. Jones said the well was 740 feet from the south line, Mr. Jones, you meant 740 feet from the north line?

A. Yes, I beg your pardon.

MR. NEWMAN: I just wanted to be sure the record was straight on that.

GOVERNOR MABRY: Anyone else to be heard on this. It will be taken under advisement, and we will take the next case. Case No. 198.

(Mr. Graham reads the Notice of Publication in Case No. 198.)

MR. KELLOUGH: My name is Booth Kellough. I am an attorney for the Amerada. This is our application for 80-acre spacing in the area commonly referred to as the Hightower Area in Township 12 South, Range 33 East, Lea County, New Mexico. We have two witnesses, Mr. Carl Barnhart, the geologist, and Mr. Bob Christie,

our engineer. I am going to attempt to limit my examination to Mr. Barnhart to geological matters, and Mr. Christie to engineering matters. And in that way present the whole picture to the Commission, but not all by the one witness.

MR. SHEPARD: Do you want your witnesses sworn?

MR. KELLOUGH: Yes.

MR. SHEPARD: Swear them, Mr. Graham, please.

(Witnesses sworn.)

CARL BARNHART, having been first duly sworn, testified as follows:

DIRECT EXAMINATION BY MR. KELLOUGH:

Q. Please state your name to the Commission.

A. Carl Barnhart.

Q. Where do you live, Mr. Barnhart?

A. Midland, Texas.

Q. By whom are you employed?

A. Amerada.

Q. In what capacity are you employed?

A. Geologist.

Q. And how long have you been a geologist for the Amerada?

A. Fifteen years.

Q. Mr. Barnhart, are you familiar with a well commonly referred to as the Amerada-State BTB No. 1 and located in Section 26, Township 12 South, Range 33 East, Lea County, New Mexico?

A. Yes.

Q. Mr. Barnhart, I hand you what has been marked Exhibit 1 and ask you to state to the Commission what that Exhibit is?

A. It is a map showing the location of the Amerada State BTB and the drilling wells surrounding it. Also outlined is an area which we anticipate to be productive.

Q. The four sections outlined in red, is that the area which is asked to be spaced in this Hearing?

A. That's right.

Q. And that shows all wells which have been drilled or are now drilling in that area?

A. Right.

Q. Does that also indicate the lease ownership?

A. Yes.

Q. And from this map it appears that Amerada owns leases covering the entire Section 23, 26, and 27; and that Gulf Oil Corporation owns leases covering Section 22, is that right?

A. Yes.

Q. Now, from that map, Mr. Barnhart, will you please describe to the Commission the location of State BTB?

A. It is located in the center of the northwest of the northwest of Section 26, 12 South, 33 East.

Q. Mr. Barnhart, I hand you what has been marked Amerada Exhibit No. 2 and ask you to please state to the Commission what that Exhibit is?

A. It is a print of the Schlumberger Survey on Amerada No. 1 BTB from the depth of zero to total depth of 11,199.

MR. KELLOUGH: We offer Exhibits No 1 and 2 in evidence.

GOVERNOR MABRY: They will be received.

Q. What is the completion date of the Amerada BTB No. 1 Well?

A. The original completion date is August 26, 1949.

Q. Did that well discover a new common source of supply or a new pool, Mr. Barnhart?

A. Yes.

Q. What is the producing formation which is discovered in that well?

A. It is lower Devonian in age, probably Devonian.

Q. Will you state to the Commission in your own words, describe to the Commission, how the State BTB Well was completed, giving the depth of the producing formation in your explanation?

A. The well was drilled to a total depth of 11,199 feet and bottomed in the basement complex.. The well was then plugged back to 10,270 feet, 5½ inch casing run to 10,270 feet. The casing was then perforated from 10,170 feet to 10,180 opposite a porous zone in the Devonian. It swabbed 35 barrels of oil in 23 hours natural. It was treated with 250 gallons of acid and flowed 1286 barrels of pipeline oil in 22½ hours, and then started making 15 per cent water through these perforations. On the basis of this test, the original initial production was filed for a total of 1386 barrels of oil plus 16 barrels of water in 24 hours flowing through a 24/64 inch tubing choke with a gas oil ratio of 270. The casing perforations from 10,170 to 180 were squeezed off, and the well was then perforated from 10,155 to 165, treated with 250 gallons of acid and completed--recompleted, that is--August 31, 1949, for a flowing potential of 781 barrels of pipeline oil in 19 and 3/4 hours through 1/4 inch tubing choke and with a gas oil ratio of 280, and a corrected gravity of 56.9.

Q. Then the well is now being produced through perforations from 10,155 to 10,165 feet?

A. That is correct.

Q. And what would you say the top of the formation discovered in that well is?

A. The top of the Devonian on our interpretation is at 10,090 feet.

Q. And what would you say the top of the effective pay is?

A. We call the top of effective pay at 10,128 feet.

Q. And what, in your opinion, is the base of the effective pay?

A. On our base interpretation we call the water oil contact at 10,195 feet.

Q. Mr. Barnhart, did the samples which you cut in that well show anything with reference to the permeability?

A. As best we could interpret from well cuttings, we did interpret the samples as carrying good porosity and probably very good permeability.

Q. Would you recommend that Sections 22, 23, 26 and 27 be included in the spacing order which you are now asking for?

A. Yes.

Q. In your opinion, Mr. Barnhart, from the information which you have from this BTB Well, does the probable productive limitation of the common source of supply or the pool discovered in that well cover at least the four sections just named?

A. In our interpretation it would reasonable to assume that the pool would cover at least those four sections.

Q. Now, referring to the map, marked Exhibit 1, will you please state--will you please point out to the Commission any other wells in the area you recommend to be spaced and tell the Commission the present status of those wells.

A. In Section 22 in the southeast of the southeast, Gulf is drilling a well at approximately 9,000 feet present depth. In the northwest of the southwest of Section 22, pardon me, Section 26, Amerada ~~was~~ drilling a well at 9,000 feet. Both wells are projected to the Devonian pay of the BTB.

MR. KELLOUGH: That is all the questions I have of this witness.

GOVERNOR MABRY: Very well.

MR. McCORMICK: Your pay is 67 feet?

A. Yes.

MR. McCORMICK: How much did it cost you to drill a well to that depth?

MR. KELLOUGH: Excuse me, please, I am not objecting to the question, but we have our engineer here who will go into the matter of well cost, and I believe he is more familiar with it than Mr. Barnhart, but if Mr. Barnhart knows, it is all right to answer the question.

A. I don't have that exact cost figures available.

MR. McCORMICK: Are you familiar with the ownership of the south half of 26?

A. As shown on our land maps, Amerada owns the south half.

MR. McCORMICK: It is fee land, isn't it?

A. Yes, it is fee land.

MR. McCORMICK: Have you consulted, or has any member of your company consulted with the royalty owners about this matter, the royalty owners under the south half of 26?

A. Not to my knowledge, no.

MR. McCORMICK: That is the only fee land in the four sections. The rest is State land?

A. The rest is State land.

MR. McCORMICK: Why do you recommend 80-acre spacing?

A. I believe on the basis of the permeability and the porosity that we found in well cuttings plus the action of the well, which Mr. Christie will give you later, that 80-acres will drain, that is, one well will drain 80 acres.

MR. McCORMICK: Is there more permeability there than in the other pools that are using 40-acre spacing?

A. There is more permeability. Of course, we are limited in

knowledge of the Devonian production, but this is more permeable from oil cuttings than our average Permian pay fields. This is a solution type of porosity, whereas most of our Permian porosity is inter-crystalline porosity.

MR. McCORMICK: Just what does that mean?

A. Larger openings.

MR. McCORMICK: Are you familiar with the Hamilton Area?

A. Yes.

MR. McCORMICK: It is now called the Knowles?

A. Yes.

MR. McCORMICK: How does this compare to that as to permeability and porosity?

A. Very similar.

MR. McCORMICK: Is it the same producing horizon?

A. Yes, approximately, both being Devonian in age.

MR. McCORMICK: That has 80-acre spacing, does it not?

A. I don't believe it has been set up, as far as I know, no rules have been made in the Knowles Area.

MR. McCORMICK: That is all I have.

GOVERNOR MABRY: Thank you, sir.

MR. ADAIR: If the Commission please, I would like to ask the witness one question. The Commission has pending before it now an application for similar rules in an area just north of the BTB Area here. I would like to ask Mr. Barnhart if this is a separate pool or a separate source of supply from the area that is productive to the north surrounding this BTA well?

A. I would say yes, based on the extreme difference in water oil contact of the two areas. This well structurally is 700 feet higher than the BTA. The oil water contact is 835 feet high. Based on that primarily, I interpret them as separate pools.

MR. ADAIR: That is all, sir.

MR. KELLOUGH: That is all, Mr. Barnhart.

ROBERT J. CHRISTIE, having been first duly sworn, testified as follows:

DIRECT EXAMINATION BY MR. KELLOUGH:

Q. Will you please state your name to the Commission.

A. Robert J. Christie.

Q. Where do you live, Mr. Christie.

A. Fort Worth, Texas.

Q. And by whom are you employed?

A. Amerada Petroleum Corporation.

Q. And in what capacity?

A. Division Petroleum Engineer.

Q. How long have you been an engineer for Amerada?

A. Approximately sixteen years.

Q. And you have previously testified before this Commission as an engineer?

A. I have.

Q. Mr. Christie, regarding this State BTB Well, do you have any information with reference to pressure, bottom hole pressure?

A. Yes, sir, we ran a bottom hole pressure test on the BTB Well No. 1 on September 15 of this year. The static pressure after being shut in for sixteen days was 3,884 pounds per square inch. The well was opened on a quarter inch choke, tubing choke, and the pressure immediately dropped from 3884 to 3853, which is a drop of 31 pounds, and the bottom hole pressure stayed at that figure during the duration of the test, which was run for 24 hours.

MR. McCORMICK: What is the significance of that, Mr. Christie?

A. It indicates to me a very effective water(deep.) *drive?*

Q. Mr. Christie, does that also indicate anything with reference to permeability?

A. During that 24-hour test, the well produced approximately 1,000 barrels, or between 41 and 42 barrels per hour. That indicates relatively good permeability, I would think, with that rate of production and no more drop in bottom-hole pressure at 31 <sup>pounds</sup> barrels.

Q. What is the gravity of the oil?

A. Approximately 57 degrees API.

Q. Do you know the cost of this well?

A. The cost is approximately \$250,000.00.

MR. McCORMICK: That is on the initial well?

A. That is on the initial well.

MR. McCORMICK: What will a field well cost?

A. We estimate that future wells to that same depth will cost approximately \$225,000.00.

Q. Mr. Christie, in your opinion, what is the area which may be effectively drained by one well?

A. Based on our PI test and on geological information on the permeability, it is my opinion that one well will drain at least 80 acres.

Q. From the information which you have obtained from this well together with the well cost, is it your opinion that 80 acres is an area which may be economically drained and economically developed by one well?

A. Yes, sir, it is.

Q. And you recommend that the Commission order 80-acre proration units?

A. Yes, sir.

Q. What recommendation do you have with reference to well

spacing and the location of wells in this area?

A. We would suggest the wells be drilled in the northwest quarter or southeast quarter of each 160 acres in the outlying area and that the 80-acre proration units be extended east and west, that is, have them running east and west.

Q. In that connection, may I ask you if Exhibit No. 1 does not show--I beg your pardon. I wish to make this statement for the Commission, the Exhibit does not show, but the records show that in the southeast of Section 26 you will notice there are two 80-acre tracts; one the north half of the southeast, and the other the south half of the southeast. And the records show there is separate ownership of those two tracts.

MR. McCORMICK: You mean of the minerals?

MR. KELLOUGH: I mean of the minerals, yes.

MR. McCORMICK: What about in the southwest quarter?

MR. KELLOUGH: It is the same mineral ownership according to the records. In every other section in the area, that is, as far as the three sections in which Amerada owns leases, the ownership is at least in 160 acres. The only 80-acre division according to the records is in the north half and south half of the southeast quarter. That may or may not be material.

GOVERNOR MABRY: Is that all from this witness?

MR. KELLOUGH: I have one or two questions, please.

Q. Do you know whether or not there has been a name recommended for this pool?

A. The nomenclature committee have recommended the name of Hightower for this area.

Q. Do you have any recommendation to make with regard to allowables?

A. We would suggest for the present, at least until we perhaps

find out more about the reservoir through future drilling, that the allowable be set as the allowable for that depth pool on a 40-acre unit, which would be, I believe, 187 or 189 barrels.

Q. 196?

A. 196, that's right.

Q. And you make that recommendation as a temporary matter, pending further development of the area, is that right?

A. Yes, sir.

Q. Do you have any recommendation to make with reference to any special field rules?

A. The only field rules that I would suggest would be a tolerance in the location of the well of 150 feet.

MR. McCORMICK: You are allowed that tolerance any way under present rules, are you not? NOT 50 (RS)

A. I believe so, yes, sir. The other rules we would prefer that the Statewide rules apply at the present time.

Q. Then you have no special field rules to recommend?

A. No, sir.

Q. Do you recommend and do you request this Commission to make this order applicable to the entire common source of supply, which has been discovered in this well, even though it may be determined to be within or without this four section area?

A. I believe it would be desirable to maintain that pattern within the entire pool.

Q. So that it is your request and recommendation to the Commission that any well drilled to this common source of supply whether within or without the area be drilled on this pattern?

A. Yes, sir.

Q. Now, in your opinion, will 80-acre proration units prevent

waste and avoid the drilling of unnecessary wells and promote conservation?

A. I believe it will, yes, sir.

MR. KELLOUGH: That is all I have.

GOVERNOR MABRY: Any questions of this witness from anyone else?

MR. ADAIR: Do you have any bottom hole analysis?

A. No.

MR. McCORMICK: Does anyone represent the Gulf here who wishes to make any statement?

GOVERNOR MABRY: If not the case will be taken under advisement, and the witnesses excused.

MR. GRAHAM: May I ask one question?

Q. What is the status of 191 which is now being continued?

MR. KELLOUGH: Mr. Adair, of the Texas Pacific, is the one that knows about this. The status of--

MR. ~~SHELLEY~~ <sup>SHUELE?</sup>: I assume you are referring to the Texas Pacific Coal and Oil Company's State BT Well. It is drilling, as I understand, in the upper part of the Mississippian Formation, and we have approximately 1,000 feet, I understand. It will be about 30 days to complete the well.

MR. GRAHAM: My question really had to do with Amerada's application in the BTA Well.

MR. KELLOUGH: Mr. Graham, as I recall it was included in connection with this application that as soon as that well was completed, the Texas Pacific would advise us and the matter could be set down. But that is separate and distinct from this hearing. As far as I know, the agreement is the same with reference to the other case, but that has no bearing at all on this particular case.

MR. GRAHAM: In the same area?

MR. KELLOUGH: But a separate source of supply.

MR. ADAIR: The Commission's action on your application on BTB will not serve as any predicate on the application pending in BTA?

MR. KELLOUGH: That is up to the Commission. Geologically the matters are different, and that is the point I want the Commission to be sure and understand.

MR. McCORMICK: I think the Commission understands that.

MR. KELLOUGH: The witness testified on that.

GOVERNOR MABRY: Will you read the next case, please.

(Mr. Graham reads the Notice of Publication in Case No. 199.)

MR. SHELDON: My name is Vilas P. Sheldon representing Roland Rich Woolley.

(Mr. Sheldon sworn.)

MR. GRAHAM: Proceed, Mr. Sheldon.

MR. SHELDON: Mr. Roland Rich Woolley, operating a lease in the name of and for A. S. Woolley, now owns and operates the 160 acre lease in the Square Lake Pool of Eddy County. This lease now has four producing wells, each one of which is drilled in the center of a 40-acre proration unit. Production has declined to a rather low figure. I don't have it here, but Well No. 2 in the northeast 40-acre unit is now producing at a very low rate, and Woolley proposes that No. 2 Well be plugged and abandoned and that an additional well, which will be an unorthodox location, be authorized some 25 feet out of the center of the 160. It would then be 1345 feet from the west line and 1295 feet from the north line of his lease. It would not crowd any other operator. It would be just in the center of his own lease. The purpose for the request is to possibly produce some oil that could not be produced with the present wells.