

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
October 25, 1961

EXAMINER HEARING

IN THE MATTER OF:

Application of Hondo Oil and Gas
Company for permission to direction-
ally drill and for an unorthodox
bottom hole location, Eddy County,
New Mexico. Applicant, in the above-
styled cause, seeks permission to
directionally drill a well in
Section 26, Township 17 South,
Range 28 East, Eddy County, New
Mexico, the surface location to be
2310 feet from the North line and
1980 feet from the East line of said
Section 26 and the bottom hole loca-
tion to be in the Empire Abo Pool
at a situs 2540 feet from the North
line and 1980 feet from the East line
of said Section 26.

CASE NO.
2410

Before Dan S. Nutter.

TRANSCRIPT OF HEARING

EXAMINER NUTTER: The hearing will come to order,
please.

The next case will be Case No. 2410.

MR. MORRIS: Application of Hondo Oil and Gas Company
for permission to directionally drill and for an unorthodox
bottom hole location, Eddy County, New Mexico.

MR. CAVEN: S. H. Caven, employed by Hondo Oil Company
Law Department, Roswell. I am appearing for Hondo in this case.

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Our witness in this case is Mr. Jack McMinn.

EXAMINER NUTTER: Are there any other appearances in this case?

MR. BUELL: Guy Buell for Pan American Petroleum Corporation.

MR. ANDERSON: R. M. Anderson Sinclair Oil and Gas Company.

MR. KELLAHIN: Jason Kellahin, Kellahin and Fox, Santa Fe, appearing for Continental Oil Company.

EXAMINER NUTTER: Are there any other witnesses in this case?

MR. BUELL: Pan American will have one witness.

(Witnesses sworn.)

JACK F. MCMINN

called as a witness by and on behalf of the Applicant, having been first duly sworn, was examined and testified as follows:

EXAMINATION

BY MR. CAVEN:

Q Will you state your name, position and employer and



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place of residence?

A Jack F. McMinn. I am employed by Hondo Oil and Gas Company at the Roswell office. I am a petroleum engineer living in Roswell.

Q Have you previously appeared before the New Mexico Oil Conservation Commission and qualified as an expert witness?

A I have.

Q Are you familiar with the Hondo's application to directionally drill a Hondo Western Yates well to be located 1980 feet from the East line and 2310 feet from the North line Section 26, Township 17 South, Range 28 East and to complete this well at an unorthodox location?

A I am.

Q Have you personally supervised the completion and had considerable experience in the supervision and operation of wells in the Empire Abo Pool?

A I have personally completed eight wells on the Hondo Western Yates block in which we have successfully completed forty-one State A leases in Abo wells and have had considerable supervision for the joint operation with the Pan American Petroleum Corporation for about fifty per cent of the wells of Pan American and Hondo and have to do with the supervision of fourteen wells operated by Humble Oil and Refining Company in which we had an interest.

MR. CAVEN: If the Commission please, I move Mr. McMinn's



qualifications as an expert witness be accepted.

EXAMINER NUTTER: Mr. McMinn's qualifications are accepted.
Please proceed.

Q (By Mr. Caven) What is the purpose of Hondo's application to directionally drill a well described above to complete this well at an unorthodox location?

A The operator recognizes that the spacing unit in question appears to be at the edge of the Empire Abo Pool. Therefore operator's desire to penetrate the Abo reef at a point under the spacing unit which would be most likely to result in a normal completion and most unlikely to result in failure.

Q Have you prepared or had prepared a plat showing the spacing unit well location of which this spacing unit is a part?

A Yes, I have.

MR. CAVEN: A plat spacing unit involved in this application and adjoining acreage is offered as Exhibit 1.

Q (By Mr. Caven) Would you please state what is shown on the plat?

A This shows the eastern portion of the Empire Abo Pool with well location and lease ownership. As you can see the proposed location is in the center of the State lease block designated HWY for Hondo's Western Yates.

Q All of the wells shown on this plat are producing from the Empire Abo Pool?

A That is correct.



Q Is the working interest in this lease jointly owned by Hondo Western Development Company Delaware Yates and that Hondo is the operator to the Empire Abo Pool under the joint operation agreement between these parties?

A That is correct.

Q Is there a diversity of ownership in the Hondo State lease covering this block?

A It is all the same working interest. The royalty interest is owned by the State of New Mexico and is dedicated to the common pool.

Q Getting to the question of the deviation in this well. Would you tell me the deviation tolerance provided by the Commission's current regulations, could you come closer to the boundaries of the spacing unit than 100 feet?

A With the surface location as it is set up, you could come closer within tolerance now allowed by the rule.

Q Approximately where do you propose to bottom hole this well that we are speaking of today?

A In the south half of the spacing unit, 100 feet north of the South line of the spacing unit on which the well is located and no closer than 330 feet to the east or west lines of the spacing unit on which the well is located.

Q What advantages do you anticipate will result from bottoming the well as requested?

A It has been our experience on the north side that the



wells require numerous expensive stimulation, installation of expensive pumping units with higher lift costs whereas we expect the well bottom as indicated to be a normal flowing completion.

Q In your opinion, would the granting of this application whereby in the best interests of conservation by increasing the ultimate recovery from the Empire Abo Pool and would it protect correlative rights?

A Yes.

Q Is there anything further that you have to say in this matter?

A I believe not.

MR. CAVEN: If the Commission please, I'd like to ask leave at this time that Exhibit 1 be admitted in evidence in this case.

EXAMINER NUTTER: Exhibit 1 will be entered.

Do you have anything further?

MR. CAVEN: No, nothing further.

EXAMINER NUTTER: Are there any questions of Mr. McMinn?

EXAMINATION

BY MR. BUELL:

Q Mr. McMinn, as I understand your testimony you said that you felt you could complete a well at a regular location by making it a pumping unit?

A That's correct.

Q Do I understand you correctly?

A Yes.



MR. BUELL: That's all I have, Mr. Examiner.

EXAMINER NUTTER: Are there any further questions of the witness?

EXAMINATION

BY MR. MORRIS:

Q Mr. McMinn, why does Hondo propose to directionally drill rather than locate a well at the surface location which would be directly above the proposed bottom hole location and drill a straight well?

A That location was a management decision over which I have no influence. It was a management decision.

Q Can you shed any light upon why the straight hole was not attempted at this bottom hole location?

A No, I am not familiar with the reasoning behind this management decision.

Q Would you agree that there is ^{more}~~no~~ risk involved in drilling a directional hole than in drilling a straight hole?

A How do you mean risk?

Q A risk of losing the hole due to equipment malfunction, due to drilling problems, just ordinary drilling problems?

A I believe there would be some more risk.

MR. MORRIS: That's all I have; thank you.

EXAMINATION

BY EXAMINER NUTTER:

Q Mr. McMinn, do you have any opinion as to whether this



is productive

entire forty acre tract ^{is productive} of oil is from the Abo reef?

A My opinion is that it is or may very well be. The absence of any well to the north of this forty acre tract in my opinion leaves us completely in the dark as to the extent of the Abo reef coverage under this spacing unit.

Q You think that this is a productive forty acre tract but you have no evidence to substantiate that?

A The tier of the forty that this well occurs in we believe to be productive. We haven't developed it up to this point and we have reason to believe that the forty in question will produce.

Q What kind of well is that directly east ^{of} the No. 36?

A 36 is a well that was stimulated so that it does go up in production, up to the point of about two months ago. At the present time it is on a slight decline.

Q Is it making top allowable?

A Yes, sir.

Q How about the No. 27 farther east?

A It's a somewhat similar case, but a little bit stronger well, but it is on a decline at the present time.

Q Is it a top allowable well?

A Yes, sir.

EXAMINER NUTTER: Are there any further questions of Mr. McMinn?

He may be excused.



MR. BUELL: We have one witness.

J. E. THOMAS

called as a witness by and on behalf of Pan American Corporation, having been first duly sworn, was examined and testified as follows:

EXAMINATION

BY MR. BUELL:

Q Would you state your name, by whom you are employed, in what capacity and at what location, please, sir.

A J. E. Thomas. I am employed by Pan American Petroleum Corporation as a junior petroleum engineer in their Lubbock, Texas, district office.

Q Mr. Thomas, what is your educational background in engineering and what has been your experience as an engineer since graduation?

A I graduated in engineering from Iowa State College and have been employed at various locations doing various types of petroleum engineer work.

Q You are now in our Lubbock district office?

A That is correct. I am in charge of the reservoir engineer group, Lubbock office.

Q Has it done all of the Pan American reservoir engineering in the Empire Abo Pool?

A It has for the last two years.

Q At the outset, Mr. Thomas, so that the Examiner and



staff can follow and evaluate your testimony, I am going to ask you to state your recommendation with respect to the unorthodox location portion of this case. What is your recommendation to the Commission in that regard?

A My recommendation is that the Commission should deny the unorthodox location because I believe the unorthodox location is completely unnecessary.

Q Why do you feel, Mr. Thomas, that the well at this unorthodox location requested is unnecessary in this case?

A I believe that a top allowable well will be obtained at a regular location.

Q All right, sir. Let me ask you this: At the outset, do you feel if the Commission should approve the unorthodox location requested here that gross violations of correlative rights will occur?

A I certainly do.

Q All right, sir. Mr. Thomas, let me direct your attention to what has been marked Pan American's Exhibit No. 1. What does that Exhibit reflect?

A Exhibit 1 is a structure map showing the top of the Abo reef.

Q Let's have a little basic agreement here, Mr. Thomas, so we can save a few words. Since a surface location and a bottom location are both involved lets you agree with me that we'll refer to the unorthodox location as the bottom hole location



being requested by the Applicant. Would you state for the record the proration unit in which this unorthodox location is being requested?

A The proration unit is Section 26, Township 17 South, Range 20 East.

Q Let's also agree that when we refer to the subject proration unit that that is the proration unit we are discussing?

A You bet.

Q All right, sir. You said Exhibit 1 reflects a structure of the top of the what?

A On top of the Abo reef.

Q All right. I wish you would look now to a well mentioned earlier. I believe Mr. Nutter asked Mr. McMinn about that well immediately off left to the east of the subject proration unit.

A I have seen it, yes.

Q What well is that?

A That is well State A No. 36.

Q Would you locate it?

A That is the same Section, Section 26.

Q Mr. McMinn testified that that well was a top allowable well.

A That is correct.

Q From the standpoint of structure I wish you would compare for the record the structural location at an unorthodox



location on the subject proration unit with the structural position of the State Well A No. 36.

A The position of the orthodox location on the proration unit would be higher structurally and therefore more favorable than proration unit H.

Q So, certainly then, Mr. Thomas, from the standpoint of structure, there is no necessity at all for an unorthodox location on this subject proration unit?

A That is right.

Q Would you look now, Mr. Thomas, at Pan American's Exhibit No. 2. Would you state for the record what that Exhibit reflects?

A Pan American's Exhibit No. 2 is a porosity treatment program contoured on the Abo reef.

Q I notice the legend on this Exhibit says an isovol map (i-s-o-v-o-l).

A It means the porosity times feet.

Q These contour lines reflect the actual volume?

A That's correct.

Q That is underneath?

A The volumes that underlie these various areas.

Q This is a tool you engineers use in ascertaining oil recovery reserve volume calculations of that type?

A That is correct.

Q All right. How have you designated the subject pro-



ration unit on Exhibit 2?

A I have outlined the subject proration unit with green. The unorthodox location is designated as a red dot and a yellow arrow pointing toward it.

Q That's the area you identified as an unorthodox location on Exhibit 1?

A That is correct.

Q With respect to the productive acreage feature of this subject proration unit, Mr. Thomas, let me ask you: In your opinion reflected by your work on this Exhibit, how many productive acres in the Abo reef do you feel this subject proration unit has?

A It indicates that all forty acres should be productive.

Q So, from the standpoint from having to crowd in to the middle of the field to avoid an unorthodox productive well, that's not the case here at all?

A That is true.

Q The Applicant could complete at a regular orthodox location a productive well?

A I believe he could.

Q All right, sir. Let me ask you this, Mr. Thomas: Does your Exhibit 2, does it show the thickness of the reef in the center portion of the field and the thinning as we go to the northern edge?

A It certainly does show a thickening as we go to the

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more higher thicker more permeable center portion of the Abo reef and thinning as we go to the north.

Q So, Applicant here is moving from a regular location or an orthodox location south and he would be moving into the thicker more permeable portion of the Abo reef?

A He definitely would be moving into a higher permeability area.

Q All right, sir. We stated that - - rather, you stated that in your opinion Applicant could complete at a location in conformance with the Pool rules a productive well. Let me ask you at this time whether or not in your opinion you think it would be a commercially productive well?

A I certainly do, Mr. Buell. Well No. 36 directly to the east has been producing at top allowable since its completion in October of 1960. And has produced 23,000 barrels.

Q I wonder if you would make the same comparison on your isovol map of the position of a well at a regular location of the subject proration unit and compare that with the position of State A Well No. 36 offset west to east.

A A location of the proration unit on the isovol map as compared to 36 should be a better well. There is a thicker section underlying that lease.

Q Now, that lease 36 it is at a location in conformance with the applicable rule?

A 330 feet location, that's correct.



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Q It is a top allowable commercial well?

A It has produced top allowable since October of last year.

Q In your opinion, a well at a regular location on the subject proration unit from the standpoint of structure and standpoint of feet, would be at a better location than this well No. 36?

A That is my opinion.

Q We have spoken of well No. 36 as being a commercial well, a top allowable well. In your opinion, Mr. Thomas, will it be an economical well?

A I certainly believe it will. It will pay out probably some time around the end of this year.

Q So it's going to be a money maker?

A That is correct.

Q Let me ask you this, Mr. Thomas: In your study of this reservoir, what in your opinion are the recoverable reserves under the subject proration unit?

A I have calculated the recoverable reserves under the proration unit as being 114,000 barrels.

Q In your opinion, Mr. Thomas, will a well located at an orthodox location on this subject proration unit, will it recover these recoverable reserves?

A Yes, sir.

Q All right, sir. Now, let's go on down to the south from this regular location we have been speaking of and let's go



down 100 feet north of the South line of this subject proration unit.

What, in your opinion, would be the volume of oil you would expect a well at that crowded unorthodox location to recover?

A I believe a well crowding the thick highly permeable center of the Empire Abo Pool would recover in the magnitude of 400,000 barrels.

Q Mr. Thomas, if a well at this unorthodox location would recover up to 400,000 barrels, what additional volume of oil coming from that would be produced by this well at this unorthodox crowded location?

A The acreage through the entire Empire Abo Pool.

Q Do you feel that that would be protecting correlative rights?

A I do not. I believe that will be a violation of correlative rights.

Q Mr. Thomas, let me ask you this: To what factors do you attribute the predicted differences in the recoveries of the two wells on the subject proration unit located differently?

A As we go north to the Abo reef and thence we find considerably less permeability than we find in the thicker section of the reef, toward the center of the Abo Pool.

Q Actually, you attribute the difference in recovery to the difference in that permeability?

A That is correct.



Q What date have you looked at that would allow you to predict the performance of these two locations?

A Well No. 36, directly to the east is denser and that type of well that you could expect from the center of the reef and the north edge location.

Q What date have you observed from that well that would indicate this to you?

A Firstly, it took a large acid treatment to make a commercial well out of this Abo well which lies in a denser less permeable area and the center of the field has a small acid treatment permitting wells to come in for rates up to 500 barrels per day.

Q If I recall correctly No. 36 well was swabbed to potential, is that right?

A Our book shows that it was swabbed on potential on October 8, 1960, 72 barrels oil in twenty-four hours indicating a considerably tighter reservoir permeability-wise than in the center of the field.

Q Even though it is tighter, permeability-wise, you are saying that it is still a good top allowable well?

A It is still a commercial well. It has made 23,370 barrels to date.

Q Mr. Thomas, does Pan American operate any pumping wells in the Empire?

A Yes.



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Q Do you know whether or not any other operators are operating pumping wells?

A I believe there are several more. I can find that if you want me to.

Q No, sir. Mr. Thomas, as a reservoir engineer do you think the fact that Applicant could make a commercial well at a regular location, even though he may have to perform a larger acid treatment, even though he may have to install a pumping unit sooner, but he could still make a commercial economical top allowable well from a reservoir engineer's standpoint, do you think that is any basis to crowd at the proration unit line?

A I do not.

Q All right, sir. I wish you would look now, Mr. Thomas, at Pan American Exhibit No. 3. What does Exhibit 3 reflect, Mr. Thomas?

A Exhibit 3 is a cross section going north to south through the Empire Abo Pool in the vicinity of the recommended unorthodox location.

Q Would you briefly state for the record the names of the well which we used to make this cross section?

A Certainly. The northmost well is State A 36 going south to No. 26, then 25, then 17.

Q So I can orient this Exhibit in my mind, Mr. Thomas, it is a north-south section immediately to the east of the subject proration unit in question?



A That is correct. It is located 140 to the east. It is 140 acres to the east.

Q All right, sir. From the standpoint of the significant portion of this hearing, the unorthodox location portion of the hearing, what is the significance of this cross section, Mr. Thomas?

A This cross section very vividly shows that the Empire Abo reef is thinning to the north and thickening to the center of the reef.

Q By moving from a regular location, from a southward direction you get into thicker more permeable pay?

A That is right.

Q Does this show in a similar form some of the same data which are reflected on Exhibit 2, the isovol map and Exhibit 1, the structure map?

A That is correct.

Q Mr. Thomas, as I recall it the Empire Abo Pool has now defined has an extremely long oil accumulation?

A Twelve million approximately.

Q I wonder if you know approximately how many miles it would take to encompass the entire periphery of this Pool?

A About twenty-seven.

Q I feel sure that you probably haven't made a study to ascertain this but let me just ask you this generally: Based on your general knowledge of the periphery of this field, would you



feel that there are many many locations around the periphery of this field where an applicant could by crowding into an unorthodox location increase the relative recovery from an individual well?

A I believe there are numerous locations where by crowding at an unorthodox location you could recover significantly more oil.

Q In your opinion, Mr. Thomas, in the event the Commission should approve this unorthodox request and in the further event that Applicant does drill the well would you then recommend to Pan American if that location is where they should ask for an unorthodox location?

A I do. I would feel that I would be forced to recommend that to protect correlative rights.

Q In other words, your recommendations to Pan Am would be to do this so you can mitigate the damage?

A That is correct.

Q For any other operator in the Pool to maintain his competitive advantage, would he have to do the same thing?

A I feel they would be forced to do the same thing.

Q Would any of these so called unit wells, assuming that this spacing is approved, would any of the unorthodox located wells increase the recoverability reserves in the Empire Abo Pool?

A No, sir.



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Q From an engineering standpoint this would be completely unnecessary?

A That is my opinion.

Q At an unorthodox location?

A That is correct.

Q Let me ask you this, Mr. Thomas: More in the way of summary in conclusion than anything else to make sure I completely understand your testimony: You stated that you are recommending that the Commission deny the unorthodox location portion of this hearing because you felt that it was unnecessary?

A That is correct. I believe that a well drilled at a standard location will be a commercial well and recover the reserves underlying that particular tract.

Q Do you feel it will be an economic well?

A Yes.

Q Drilled at a regular location and it will make money?

A I believe it can.

Q All right, sir. Let's turn to the other side of the conservation coin. Let's turn the coin over and look at the protection of correlative rights' side of the coin. Do you feel that a well at a regular location would protect everyone's correlative rights including the Applicant's?

A Correct, at a regular location.

Q Conversely, you feel that a well at an unorthodox location would cause a gross violation of correlative rights?



A I feel that a well crowding the structure in the higher permeability portion of the Empire Abo reef would result in violation of correlative rights.

Q Do you have anything else that you would like to add to the record at this time?

A I do not.

MR. BUELL: That's all we have at this time.

EXAMINER NUTTER: Are there any questions of Mr. Thomas?

EXAMINATION

BY MR. CAVEN:

Q Has Pan American had any experience with drilling holes on the north side of the Abo Pool?

A We certainly have.

Q Do you mean you have drilled some?

A That is right, at a standard location.

Q How do you account for this in view of this information that you had?

A I believe that we got close to the edge where there is usually a very good possibility of getting a commercial well. In the oil business we all have to take our chances.

Q You don't have anything to lose if Hondo drills the well at a regular location and doesn't secure a commercial well but you feel confident that you have to recommend to us that we do that?

A That is correct.



Q Have you also considered a drilling location to the west of the particular lease block, specifically the southwest quarter, northeast quarter of Section 27?

A I recommended to my manager that we do drill a well there.

Q What response have you received?

A They have not yet approved it.

Q When did you make the recommendation?

A About two months ago.

Q What is the normal expectancy on one of those?

A I can't really forecast what my management will do. I can only make the recommendation. I believe that probably the reason they haven't is that there are several more blocks further west located to the south where I'm sure my management would like to see wells drilled prior to their drilling a well.

Q In spite of the fact that your management hasn't seen fit to drill you want to Hondo to do so?

A I feel that Hondo by drilling a well at a standard location will get as good a well as they have in 36. I would like to point out that a well at No. 36 which has produced 23,000 barrels to date, even if you're assuming it goes on a very sharp decline of 20 per cent you should recover an additional 90,000 barrels of oil.

Q In connection with this No. 36 well, where did you say you see that information?



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A Most of it I got out of the Commission file. It has definitely produced top allowable for years. I would also like to point out that I think that 61 barrels a day pumping is a mighty good well for a lot less than that.

Q However, that is your opinion and apparently there have been occasions when you have not necessarily been correct in assuming that a spacing unit would produce at a regular location?

A No engineer is right all the time, that is correct.

Q I understand that that may be the case. Did you say that this pay in this Pool or this Section thickens as it goes to the north?

A No, sir, it thins as it goes to the north.

Q Where is the maximum thickness in the pay?

A In the center of the reef.

Q Has that been substantiated by the wells that have been drilled?

A Yes, sir.

Q With regard to your recommendation for drilling at an unorthodox location as crowding the normal boundary line, for a spacing unit surrounding the edge of the Pool, does that proposal or recommendation apply to the south side as well as the north side?

A I believe that I stated that I made a recommendation as to an unorthodox location. I never recommended anything about an orthodox location.



Q I beg your pardon. I thought you said if this hearing granted approval for the unorthodox location that you would recommend to your management that they protect correlative rights by moving into these spacing units which allegedly bound the Empire Abo Pool for a distance of 27 miles and crowd the locations.

A There are not as many locations in the south because the reef structure dips considerably more sharper to the north and the north has many more locations of that type.

Q So, in the south you can't say 27 miles of location would be in this area?

A There are locations in the south, also.

Q Do you know how many?

A No, sir.

Q Did you say that wells drilled at these locations, assuming they were drilled, would not increase recovery reserves?

A I believe that wells drilled at this location, that reserves out there will substantially be recovered in the center of this Pool.

Q Do you mean that the ultimate recovery will be increased or decreased by the drilling of wells as proposed?

A Actually, probably the ultimate reserves in this field will be decreased by moving into the higher permeability area because this lower permeability area wears your reserves out and will not be designed to as low a pressure as if a well were drilled at that location.



Q Reserves we can change, we can't the recovery, as I understand it?

A I agree. You can't change the amount of ultimate recovery by draining other people's oil if you crowd the structure proration unit line.

Q With regard to ultimate recovery for the total Pool, it's your opinion that drilling a well in this location, drilling a well in this location or similarly located wells would decrease the ultimate recovery from the Empire Abo Pool?

A Would you state that again?

Q You say drilling a well at this location, the center location rather than the edge of the Empire Abo Pool would reduce the ultimate recovery from the Empire Abo Pool?

A I believe that the difference will be quite unappreciable over the overall picture, but I want to point out that I think that the center portion of the Empire Abo reef has excellent communication and those reserves will be obtained by the wells drilled at standard locations. I believe that if you drill a well in the tighter lower permeability section you will probably get oil underlying that particular location or that immediate vicinity, that you may be draining from the center of the field due to the fact that you are apt to draw the pressure down in that tighter interval. It's merely a matter of permeability.

Q By drilling wells, drilling this well and bottoming it in the location that we have proposed at an unorthodox location



or drilling wells on spacing units surrounding the fields at similar locations would increase or decrease the ultimate recovery from the Empire Abo Pool?

A I believe it would be a slight decrease in the ultimate recovery from the Empire because you'd not drain as thoroughly the tighter intervals you would get as if you drilled at a standard location.

Q What are the mechanics of the reservoir that would lead you to this?

MR. BUELL: The question has been asked no less than three times.

EXAMINER NUTTER: Why it wouldn't produce, is that it?

A Mr. Cavens, as you know it takes pressure on your reservoir to force oil into the well bore. If you drain a well in this tighter interval, the permeable interval, you can draw the pressure in the immediate vicinity to a lower pressure before abandonment. Then you're going to draw the oil from the wells in the center portion of the field or from a well near to the center portion of the field. That particular well which crowds the structure will be, I believe, in a higher permeable zone and will recover considerably more oil, but it will be everyone else's oil along the twelve-mile Pool.

Q How far do you think this communication extends?

A In the center of the Empire Abo reef there is excellent communication as shown by all the history obtained.



Q Would you say that every well drilled except for the Crystal well has the same affect?

A That is correct. That is, wells in the standard location.

Q So that the affects substantially differ?

A When an unorthodox location is thoroughly drilled within the framework of the State wide rule.

Q So that you feel Pan American would want to take advantage of this circumstance to prevent recoveries of oil in an economic manner from this location?

A I do not feel that Pan Am is taking advantage of anybody.

Q No, I didn't say that. I said you are taking advantage of the rule.

A No. I think it is very difficult to devise an allocation formula that is 100 per cent workable, that works 100 per cent in protecting correlative rights and still be practical to administer. I feel that the one we have is fine, particularly if we abide by our other rules. I believe it is as practical as we could have.

Q What is your experience in other oil-producing states with this circumstances? Is this a common rule?

A What circumstance are you referring to?

Q The drilling on the edge of a pool.

A I personally believe all wells should be drilled on



standard locations.

Q What is your experience in other oil-producing states?
I presume you have experience in Texas.

MR. BUELL: I believe I am better qualified to answer that than Mr. Thomas. I think it notoriously well known that Texas has a rat race, you might say as far as spacing exceptions are concerned. Actually, for this year, as of October 21, they had over 1,326 spacing exception applications filed.

Does that answer your question?

A (By Mr. Caven) You stated that the well would recover 114,000 barrels. You estimated that it would recover 114,000 barrels. Do you have an estimate as to the length of time over which that recovery would be?

A First off, I want to express the fact that I said it was my opinion the recovery of oil underlying that tract would be 114,000 barrels if it produces at the rate of 3,600 for the last year, approximately 23,000 a year and doesn't go on too sharp a decline, I think it could be produced within ten years.

Q In other words, that well would go from its complete production to complete drainage within a period of ten years?

A No, I don't think I meant it quite that way, Mr. Caven.

Q When would they get the last barrel of that 114,000 barrels, in your opinion, under the present circumstances?

A You are asking a question that is real hard to determine. I imagine - - I think it will recover 114,000 barrels and it may



recover more when the permeability is developed in that area.

Q You estimate that the life of the well in the Empire Abo reef is twenty years?

A No, sir, I do not. I would say where the life of the well in the least permeable zone might be twenty years where the entire field may be considerably longer.

Q I see. Well now, the additional production which you say will be drained from the other portions of this Pool, when would you say that would occur assuming this well is drilled at the orthodox location or is not drilled. When would you estimate that oil could be recovered?

A I believe the operators - - you mean the oil that is being confiscated, so to speak?

Q Yes.

A That oil would be recovered by the operators it rightly belongs to, in my opinion, near the end of the field.

Q What is your estimate as to what period of time that will take?

A A lot of it has to do with the proration picture.

Q What is your forecast? I assume you have made those?

A My present forecast with normal producing allowables in New Mexico surely doesn't go beyond ten years. Otherwise, I have no idea.

Q Assuming you were going to build some production there what basis would you purchase the production on?



A I feel that the main portion, the center portion of the Empire were thoroughly produced at top allowable until it gets a fairly low bottom hole pressure.

Q How long will it be producing at top allowable and producing these additional two hundred some odd thousand barrels?

A I really don't see where that has anything to do with it.

MR. BUELL: Again, I hate to interrupt but I feel that some of these questions are a way far afield as far as pertinence and relevance to this hearing are concerned.

EXAMINER NUTTER: I agree. If we could keep the questions a little more pertinent and brief, Mr. Caven.

MR. CAVEN: I think that's all we have.

EXAMINATION

BY EXAMINER NUTTER:

Q Mr. Thomas, this contour map is the top of the reef itself, is that correct?

A Yes, sir.

Q Does this reflect the top of the porosity necessarily?

A Yes, it does.

Q Is the porosity at the top of the reef?

A The greater portion of the reef is presently, well, through the entire reef section. Now, it may be that there are smaller intervals which are not, which have a low order of porosity.



Q In some places on the north side of this reef there exist some stringers which may not be reef themselves but they are productive of oil. Do you know whether such stringers exist along in this area?

A I feel that those stringers are correlative to the reef. They're connected to the reef, in communication with the reef. Well No. 36 has the same gravity and essentially the same GORs as wells in the center of the field.

Q You feel these stringers are in communication with the reef proper?

A Yes, but a poor order of communication because of the low order of permeability.

Q They have a low order of permeability?

A There is lower permeability along the north. There are only seven which are less than top allowable edge wells.

Q Are those mostly on the north or south side of the reef?

A About half and half. There are a few more on the north.

Q Does Well No. 36 A make water?

A The Commission report does show that it makes water.

Q Do you know whether it makes water on initial completion?

A The scout book that I looked at does not show it.

Q Your Exhibit reflects that made 76 barrels and 135



barrels of water, is that correct?

A No. 27 is getting into the water table, Mr. Nutter on the south side of this reef.

Q By virtue of the lower permeability?

A By virtue of lower permeability and structurally. This water table, incidentally, of mine agrees with the water table previously found in No. 34 A in Section 25 of 2680.

Q Now, Mr. Thomas, referring to your Exhibit No. 2. That is the isovol map. It would appear that this bulge in the five-foot line is the main thing that takes care of the proposed well if it were drilled on a standard location?

A That is correct.

Q Now, is that bulge based primarily on the bulge there in No. 24 A?

A That is right.

Q Does the 24 A encounter more porosity - -

A Yes.

Q - - than the same amount of - -

A It encounters more pay, too.

Q More pay and more porosity?

A And a higher type of porosity.

Q Referring to your Exhibit No. 1, it shows that 24 A made 432 barrels upon completion yet it got less volume than the No. 2.

A These wells have not been penetrated only about 10 or



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20 feet. It is a section with the permeability directly at the perforations so there may be additional pay.

Q The potential doesn't mean too much on Exhibit 1?

A No. It merely shows it is a strong well where it's perforated.

Q How much pay does the No. 36 A encounter?

A The No. 36 A as shown on our Exhibit 3 encountered 84 feet gross.

Q 84 feet?

A Yes.

Q How much reef do the wells in the center of the reef encounter? How much pay?

A In the center of the reef, it averages approximately 300 feet.

Q So, this well No. 36 A - -

A That average for the entire field, that's all the wells including the center, averages 400 to 600 feet.

Q You stated that you had recommended to your management that they drill a well in the north of 27? Was that the location?

A I meant the southwest.

Q The southwest of the northwest?

A That is correct.

Q But you haven't heard from them yet?

A No, sir.



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EXAMINER NUTTER: Are there any further questions of

Mr. Thomas?

He may be excused.

(Witness excused.)

EXAMINER NUTTER: Do you have anything further?

MR. BUELL: No, sir. That's all we have except for a closing statement.

EXAMINER NUTTER: Is there anything further anyone wishes to offer in this case?

MR. ANDERSON: I am R. M. Anderson, Sinclair Oil and Gas Company. I would like to make a statement with regard to general policy.

It has been our policy to oppose exceptions to spacing rules after development has taken place in a field. We feel that if exceptions are to be granted that they should be granted at the beginning of the development in order that all operators that are to drill will have an equal opportunity to take advantage of irregular locations, locations that will be made regular by a special rule for a particular field and in this specific case, we would like to object from a policy standpoint and also we would like to concur with Pan American in their analysis which shows that a violation of correlative rights of the other operators in the field will occur by the granting of this application and Sinclair as a large operator in the Empire Abo field objects.



MR. KELLAHIN: Jason Kellahin, Kellahin and Fox, appearing on behalf of Continental Oil Company is in agreement with the policy principles which were just stated by Mr. Anderson with regard to the variations in spacing and well locations in that they should be granted early in the life of a pool if at all in order that everyone can protect themselves in the event of violation to correlative rights.

I would like to comment on the testimony a bit. Naturally, when you've got the edge location it always creates what appears to be a hardship on the owner of acreage in that location. Testimony here today by the Applicant is based on that. They say that the unit is at the edge of the Empire Abo Pool field with which there apparently can be no argument. They want to drill at a location most likely to obtain a normal completion. In other words, they're not willing to admit or even speculate that all of the acreage they propose to dedicate isn't productive of oil yet. Their attorney, in cross examining the witness offered by Pan American, would seem to infer that a well at an orthodox location wouldn't be a commercial well. If that were the case this matter should be heard upon a request whether they were entitled to full allowable. That case is not presented here. Their witness said that acreage is productive and if they could complete a well at an orthodox location they would probably create a commercial well. Certainly, the testimony offered by Pan American shows that they could complete a commercial well at

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that location and it is the only testimony which was offered in this case backed up by engineer analysis. With all due respect to Mr. McMinn - - I don't question his testimony for one moment - - he said he could drill at the proposed location. He didn't support that by a cross section map or any other items of engineering information. The only information offered here was offered by Pan American and we oppose the application on the ground that there is nothing here to show the necessity for the unorthodox location, the bottom hole location.

MR. BUELL: May it please the Examiner, I would like to briefly say that in my opinion this is one of the most critical cases that this Commission has had before it in some time. I will admit that it looks small now and not big, that it is a simple question for one unorthodox well location in the Empire Abo Pool, a Pool, incidentally, which has developed and drilled over 200 wells. Actually, this is the first hearing that we have had for an unorthodox location. There have been two, I believe, granted administratively due to surface reasons including an orthodox location.

I am glad that Mr. Caven brought up Texas because if there is ever a sorry state of affairs, if there is a horrible example, it's Texas. You can take that from one who has had to live with it. I stated in answer to his question that to October 21st of this year, there have been over 1,300 applications for spacing exceptions and based on my experience with many of those cases.



only about one per cent were actually needed to either prevent waste or to protect correlative rights.

If the Commission approves this application, even if they approve it with a penalty, in my opinion the flood gates are going to be opened in the Empire Abo Pool. I have to admit that Pan American will be the first with its hat in hand for an unorthodox location or location in order that we can protect ourselves and minimize the damage that would accrue to us.

From the standpoint of the record there is not one iota of evidence in this record that even begins to justify an unorthodox location. Both witnesses for the Applicant and Pan American have testified without qualification or equivocation that at a regular location a commercial economic well could be completed. Actually, the record, the evidence is to the contrary, that probably waste, although a very minor portion, that waste would still result if the unorthodox location were approved. The record is crystal clear as to the gross violation of correlative rights and from the point of preventing waste and protecting correlative rights, both of these cry out that it be denied and denied completely.

MR. CAVEN: With regard to the question raised by Sinclair and Mr. Buell with regard to the granting of the exception, the type of section we have here is hardly likely to occur at the inception of a field because this is a situation where we are probing for the boundary and trying in that attempt to find the

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most economical way to find the boundary of the field and still get a reasonable return on the investment that we are making in the well.

EXAMINER NUTTER: Are there any further questions or statements in this case?

MR. MORRIS: If the Examiner please, the Commission has received correspondence from Mr. William R. Loar, Chief Proration Engineer, Sunray Mid-Continent Oil Company in which he says "In reference to the New Mexico Oil Conservation Commission Case No. 2410 which has been set for hearing October 25, 1961, it is our understanding that Hondo Oil and Gas Company proposes to bottom their directionally drilled well in Section 26, Township 17 South, Range 28 East, approximately 100 feet from the unit line. Sunray Mid-Continent Oil Company, as an operator in the Empire Abo Pool, recommends adherence to the spacing rules, and any advantage gained by a location exception for structural or producing advantage should be compensated for by a production penalty."

EXAMINER NUTTER: Is there anything further in this case?

The case will be taken under advisement.



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I, THOMAS F. HORNE, Court Reporter, in and for the County of San Juan, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in machine shorthand and reduced to typewritten transcript under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

Thomas P. Larne
Notary Public

October 2, 1965.

I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case No. 2440
heard by me on 10/25, 1961.
Notarum, Examiner
New Mexico Oil Conservation Commission

