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PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

BEFORE THE  
OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO  
SEPTEMBER 30, 1959.

IN THE MATTER OF:

Application of Pan American Petroleum Corporation for approval of a unit agreement. Applicant, in the above-styled cause, seeks an order approving its Northeast Hogback Unit Agreement, comprising 10,572 acres, more or less, in Township 30 North, Range 16 West, San Juan County, New Mexico.

CASE NO.  
1769.

BEFORE:

Daniel S. Nutter, Examiner.

TRANSCRIPT OF PROCEEDINGS

MR. NUTTER: Next case on the docket is 1769.

MR. PAYNE: Case Number 1769. Application of Pan American Petroleum Corporation for approval of a unit agreement.

MR. MANN: Bert D. Mann of Farmington, New Mexico, representing the applicant. We have two witnesses.

(Witnesses sworn.)

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J. W. D U R K E E, a witness, called by and on behalf of the Applicant, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. MANN:

Q State your name, please, and by whom are you employed?



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A J. W. Durkee, Pan-American Petroleum.

Q In what capacity?

A Land management.

Q Have you worked with and are you familiar with the unit agreement, the subject of this application?

A Yes, I am.

Q Do you have a plat of the proposed Northeast Hogback Unit?

A Yes, I do. Each unit agreement has an exhibit attached thereto, which --

Q Would you state what this exhibit shows, please, sir?

A Our proposed unit covers 10,572 acres in Township 30 North, Range 16 West, San Juan County; the legend up in the upper right hand corner represents the type acreage within the unit; the green being Federal, brown being State, the blue Patent, and then we have one tract there which has rather peculiar status; in some lease it was reserved for San Juan Indian School, and at this time the Navajos traded, or the Bureau of Land Management leased it out.

Q That is the tract in red?

A That's correct, tract 34.

Q Has that proposed unit agreement been submitted to the U. S. Geological Survey?

A It has.

Q And previously --

A Yes, sir.



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Q -- has the form of the agreement been submitted to the Commission about the plan, the State of New Mexico?

A Yes.

Q Have they given the preliminary agreement on this?

A They have done so in writing.

Q Have the working interest owners of the lease in this area all had an opportunity to join in the unit agreement?

A Yes, they have.

Q And have all of the royalty owners in the area had an opportunity to join in the unit?

A Yes, they have.

Q What is the basis for sharing of production from the wells to be drilled on this unit?

A In the event any of our exploratory wells are productive, participating units will be formed around those productive wells, and participating areas for Geological entrance, and typed.

Q And the participation will be on an acreage basis?

A That's correct.

Q Are the two State leases in this unit area -- in what respect are the interests of the State protected?

A There are more than two State leases, two State tracts. We feel the interest of the State will be served from a conservation standpoint, and the discovery production.

Q Are either of the wells that are proposed to be drilled



on this State acreage?

A In the event the unit is given final approval by the State and Geological Survey, we will have Pubco commence the first well in the Northwest corner of Section 36, which will be directly on State lease E-8343.

Q Mr. Durkee, is there any manner in the terms of the operating agreement in which the interests, there could be discrimination against the interest of the State of New Mexico, or any other royalty owners in the unit area?

A Not to my knowledge.

Q And this is equally applicable is it not, that there could be no discrimination as to the various institutions of the State of New Mexico which own the State's lands in this area?

A That's correct.

Q What is the -- What cost does the unit agreement provide for in development and drilling of exploratory wells?

A We have drilled four initial exploratory tests; that was the minimum that the U. S. G. S. would grant us approval on.

Q Is there any way that this unit could be perpetrated without discovery of production under the unit by wells prospectively drilled?

A No.

Q Discovery is essential to the perpetration of the unit?

A That's right.

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Q There are existing wells within the unit area?

A That's correct, producing from Gallup formation.

Q And the unit agreement does not provide that these existing wells would perpetrate the unit?

A No, it does not, and Mr. Anderson of the Geological Survey told me the only way the existing wells could ever be brought in, in the event one of our Dakota wells were drilled after the interest was approved, took place, is if it encountered Gallup production, which could thereby establish a Gallup formation.

Q After production of the new wells, and the existing wells, as far as the Geological Survey is concerned, they could be brought into the unit?

A That's correct.

Q Was the exhibit, and the unit agreement, which we submit as an exhibit, prepared by you under your direction?

A Yes, it was.

Q To what extent has the unit agreement been signed by the various working interests on there?

A Percentagewise as to Federal lands, 66 percent, 66.67 percent of the Federal land now committed. With respect to the State lands, we now have 5.6, percentagewise.

Q That is 5.6 percent of the unit as a whole?

A Of the unit as a whole. Now, the State land represents only 5.666 percent of the total unit area that we have; all but in that 5 acres.



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MR. NUTTER: On the Federal, do you mean 66 percent of the unit, or the land?

A 66 percent of the unit.

MR. NUTTER: Then the Federal lands are committed?

A Yes, sir, the percentage on Federal basis would be 79 percent.

Q (By Mr. Mann) Of the Federal acreage?

A Yes, sir.

Q What is the situation as to fee lands?

A That is changing day to day; we just got word a few minutes ago that we got one more tract committed; the fee lands in the area constitute a total of 59.2970 percent, and at this time we have approximately two and a half percent committed, meaning about half the field.

Q By committed, you mean both the interest owners and the royalty owners in that area?

A That's correct.

Q And of the total percentage which can be committed to the unit at this time, in light of this unleased Indian reserve acreage, what is it?

A 94.862 percent is the maximum that can be committed, in view of that one tract.

MR. MANN: I believe that's all.

MR. NUTTER: Any questions of this witness?



CROSS EXAMINATION

. PAYNE:

Q Mr. Durkee, can you figure out what percentage of the working interests are committed, that is in the entire unit?

A In the entire unit -- just a moment, sir; 76.347 percent.

Q Thank you. Mr. Durkee, is there more of Sections 16, 21, 38, and 23 than is shown on the exhibit, do they extend further to the West?

A It is my understanding that that portion of acreage that has a red line represents the Reservation boundary.

Q Indian?

A Indian, tribal.

MR. NUTTER: And do the sections actually extend into the Reservation?

A I understand they do.

Q (By Mr. Payne) That is the portion of the sections not within the Reservation?

A That's correct.

MR. NUTTER: Does anyone have any further questions of Mr. Durkee?

QUESTIONS BY MR. NUTTER:

Q Now, this plat describes, Mr. Durkee, describes this portion of the acreage which is outside of the Reservation?

A Yes, that's correct.

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Well, now, how is the acreage described that is inside the Reservation, are there some lots on there also?

side That, I do not know; we have not investigated that we did not feel it was important in this particular issue.

Q What you are really after is just including that one of those four sections -- I guess it is five sections, including the Navajo, isn't it? I mean, number 15, is it the Navajo in any --

A No, sir, it is not; the Navajo boundary continues North there, due North, rather than --

Q So what you are after is only the inclusion of that section of 16, 21, 28, 33, which lies East of the Navajo Reservation boundary?

A That's correct, sir.

Q Mr. Durkee, the unit agreement describes Section 21 as being lots 1 through 16, inclusive, or all? --

A Well, unfortunately, I can't --

MR. MANN: If the Examiner, please, I think that is just an irregular section, because they stopped the survey at that boundary. It is apparent what happened, or they wouldn't be described as lots at all.

MR. NUTTER: I was wondering if they had a lot of lots coming through the East side of the Reservation area, and some on the West side. It appears there are some sections outside of the Reservation lines.

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A That's correct; you see it one way, and then another. I am not just exactly sure what the picture is outside of the Reservation, and those on the East side, which is what we are presently concerned with, which are taken from the Federal plats, which are prepared under the supervision of the Government Land Office; well, the records to that plat is right at the lefthand corner of the map, the survey of December 3rd, and the previous survey June 25, 1910.

MR. NUTTER: Any further questions of Mr. Durkee? He may be excused.

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W A Y L A N D R O B E R T S, a witness, called by and on behalf of the applicant, having been previously sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. MANN:

Q Would you state your name, and employment, please?

A Wayland Roberts, Pan American Petroleum, Farmington.

Q What is your position with Pan American?

A Presently I am area geologist in charge of the San Juan Basin.

Q Have you previously testified before this Commission?

A No.

Q Would you briefly state your education and professional qualifications?



A Well, I received my Bachelors degree from Texas Christian University in 1950, and immediately went to work for Pan American; during the last nine years, I have worked as a geologist at Midland, Roswell, Fort Worth, Albuquerque, and now Farmington District offices; and the past five years I have been dealing primarily with the San Juan Basin; and the past three years I have been classified as an area geologist in the San Juan Basin.

MR. MANN: Are the witness' qualifications acceptable?

MR. NUTTER: Yes, sir.

Q (By Mr. Mann) Are you familiar with the geology of the area of the application?

A Yes, sir.

Q Would you refer to what we will submit as Applicant's Exhibit 3, and state what it shows on that exhibit?

A Well, this exhibit shows that proposed unit as outlined, which is outlined in red; here we have subsurface structure contours up on the Gallup sand dipping in this direction; we have relatively flat dips behind the Hogback monocline. As we approach that monocline and we go to 50 foot, the dips range from 20 to 30 degrees, and then they begin to flatten out and diverge on out to the San Juan Basin.

Q What is indicated by the hatcher sections on that map?

A We have three prospects in the cretaceous sections



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that will be penetrated. The Dakota constitutes a prospect over the entire unit area; we got these in descending order, these --

Q Is the brown hatched --

A The brown hatched line here is a line where we think that the Mesa Verde group would be productive, as it approaches the Hogback monocline; the green hatched line as you will note parallels the black line monocline, and the estimated extent of the fracture dip production; the red hatched line in a North and West-Southeast direction across the North end of the proposed unit, is the estimated extent of the Gallup sandbar production.

Q What is shown by the red dots on this exhibit?

A The red dots, the big red dots are the four proposed Dakota wildcat locations, and there is one that is not red.

Q For the benefit of the reporter, will you state the locations?

A The first proposed well that we plan to drill is in the Northwest quarter of Section 36; and then depending on rig activity, the second and third and fourth wells will be drilled the second well a lot more than likely will be drilled in the Northwest quarter of Section 24; the third well in the Northeast quarter of Section 25, and the fourth well in the Northwest quarter of Section 22.

MR. NUTTER: The third well was going to be drilled where, Mr. Roberts?

A In the Northeast quarter of Section 15.



MR. NUTTER: 15?

A Yes, sir.

Q (By Mr. Mann) In your opinion, is the entire unit area probably productive of oil or gas?

A In my opinion, the entire interval, or entire unit area offers potential from one or more of this cretaceous sand that will be encountered by the four proposed tests.

Q Is it your opinion that the productive limits of the protective pool will extend to the -- what has been beyond that?

A I feel that the outline we have here reasonably limits the expected productive limits of these certain types of stratigraphic traps, but for these reasons, the San Juan river, as you approach the site down here, is cutting through the Mesa Verde, and even goes so far to cut it through the Chaco Canyon, which in my opinion would reduce the mobility on your direction; of course, we got established to the North, which continues quite a ways, but in my opinion, these lines, these shaded areas reasonably depict the limits of anticipated production.

Q I notice that in certain instances the shaded areas extend outside; could you tell us how the particular unit boundary was selected?

A Initially, we discussed this with Mr. John Anderson in Roswell, and we showed him our geology on the prospect, and showed him that as we went West from this Hogback monocline, which is your major structural feature in the sense of the unit, as you

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went West you began to particularly have a pickup of your more gentle dips westward to the unit; where you go on the East side of the unit, the South limits of the unit were limited by the presence of the San Juan river, and the Navajo Reservation, as well as this West limit here, established production limited as on the North side, and probably more important than that, Mr. Anderson outlined this and said this is the area he would recommend for approval.

Q You do have the preliminary approval of this proposed unit?

A Yes, sir.

Q What are the proposed tests -- well, what formations are they to test?

A In drilling the four proposed test wells, naturally these wells on the western side, on the side of the monocline, will encounter the entire cretaceous section which will be 2,000 feet, it will increase rapidly, which will be 2,000 at the Southeast corner of the unit, maybe 5,000 feet in depth. In drilling the five wells on the Dakota, we will encounter three major prospects in the area, your Dakota, your lowermost zone to be penetrated offers potential from two type traps, mainly a primary stratigraphic trap due to variation in pathology and terminology, and the acreage in the monocline, and a second stratigraphic trap caused by the infiltration of fresh waters from the outcrop approaching the Hogback monocline giving us enough stratigraphic



potential in the Dakotas, that is evidenced by a good gas show in the Hoover in Section 23, and the predominant indications of fresher waters behind the Hogback and typically saline waters in front of the Hogback. Up the section from the Dakota, we encounter the Gallup, which again offers two types of stratigraphic traps, the fractured type, delineated by the green hatcher area, and closely associated with the Hogback monocline and the sandbar type trap, normally referred to as the Horseshoe Canyon trend coming across the East end of the proposed unit; moving up the section, we encounter the Mesa Verde which produces the Mesa -- which incidentally, the Mesa Verde group composes in most part this steep monocline that is present through the interval. So moving to the Southeastern part of the proposed unit, we feel that the Mesa Verde would offer some potential from two types of traps, essentially the same as those discussed from the Dakota primarily from the change and secondary stratigraphic traps due to a water block caused from fresh water coming through the upcrop.

Q Mr. Roberts, does your testimony today, on this exhibit you have prepared, vary from the geological report and the plat submitted to the Commissioner of Public Lands when this application was originally submitted several months ago for preliminary approval?

A Essentially, the geologic prospects do not -- has not changed. We have had to alter slightly the position of some anticipated areas of production due to additional drilling that



has developed since the preliminary approval; one of the main changes that has occurred has been the changes of the locations. Originally, we had planned our initial test up in the Northwest quarter of Section 13, these people up here have elected not to join the unit. We have moved further down the unit proper, and planned the well in the Northwest quarter of Section 24 initially, correct. The second test remains as it was originally presented. The third test was originally planned to be drilled in the Southeast of the Northwest of Section 22; we have moved it diagonally to the Northwest quarter of 22 to diagonally offset a State tract.

The fourth test down in the Southeast part of the unit was originally planned in the Northwest quarter of Section 35; it has been moved a mile East to be located directly on a State tract.

Q Have there been wells drilled in the unit area?

A There have been, since the preliminary approval, we have had Gallup wells drilled in the northeastern portion of the unit.

Q Were those wells drilled with the consent of the United States Geological Survey, in the light of the fact that there was a pending unit agreement?

A Yes, sir, it is my understanding, I do not know whether it was written or verbal, but we discussed the dilemma, and that we had in -- keep from moving toward us, from the unit in the working, and the United States Geological Survey said, "Go ahead and drill your wells, and then we will work that out



when we get the four exploratory wells down." As Mr. Durkee testified, none of these wells would be included in a precipitating area until production is established from one of the wells that was drilled after the unit has been given final approval.

Q In your opinion, will the four proposed test wells give an adequate exploratory test of the unit or area for determining the probable productivity?

A Yes, sir.

Q In your opinion, will the development and operation of unit area as a unit, tend to promote the conservation of oil and gas for the best utilization of reservoir energy?

A Yes, sir.

Q Will the granting of this application prevent waste?

A Yes, sir.

Q Was this exhibit prepared by you?

A Yes, sir.

MR. MANN: We would like to offer the Unit Agreement as our Exhibit 1, or however you have it marked, our Unit Agreement as our second exhibit, and this other agreement --

MR. NUTTER: Pan American's Exhibits 1 through 3 will be entered in evidence, without objection.

MR. MANN: That concludes my questions.

MR. NUTTER: Does anyone have any questions of the witness?





CROSS EXAMINATION

BY MR. PAYNE:

Q Mr. Roberts, are there any producing wells in this unit area, except these wells which are completed in the Gallup up in the Northeast portion?

A No, sir.

Q Now, if you do get production from these proposed test wells, and establish a participating area, will the Gallup where these wells are currently completed, come into a participating area too?

A That is my understanding.

Q But not until you do get production?

A Not until we establish, right.

Q So if none of these test wells that you propose here get production, then what happens?

A Then the unit will be perpetuated by additional development, additional wildcat drilling, I suppose.

Q And that wouldn't result in any plans, and the thing would be developed, it wouldn't become any participating area then?

A That is my understanding.

MR. MANN: I believe, if it please the Court, the testimony is that the United States Geological Survey has said not only will the other wells have to get production, but they will have to get production in the Gallup before you can form a

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participation area to include those in the Gallup participating area.

MR. NUTTER: Then they will be -- continue to be operated by their present owners until such a time as other Gallup production is obtained in this area?

MR. MANN: That's right.

MR. NUTTER: Any further questions of the witness? He may be excused. Does anyone have anything further to offer in Case 1769? We will take the case under advisement.

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STATE OF NEW MEXICO     )  
                                  ) ss.  
COUNTY OF BERNALILLO    )

I, G. R. GONZALEZ, Court Reporter, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in stenotype and reduced to typewritten transcript by me and/or under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal, this, the 10th day of November, 1959, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

G. R. Gonzalez  
G. R. GONZALEZ, Court Reporter.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1769 heard by me on 9-30, 1959.

[Signature], Examiner  
New Mexico Oil Conservation Commission



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