STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:	CASE NO. 12,463
APPLICATION OF POGO PRODUCING COMPANY TO AMEND THE SPECIAL POOL RULES FOR THE McMILLAN-MORROW GAS POOL OR, IN THE ALTERNATIVE, FOR AN UNORTHODOX GAS WELL LOCATION, EDDY COUNTY, NEW MEXICO	ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

July 27th, 2000

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner on Thursday, July 27th, 2000, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

July 27th, 2000
Examiner Hearing
CASE NO. 12,463

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E X H I B I T S

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HEYCO:	Identified	Admitted
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* * *

A P P E A R A N C E S

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FOR HARVEY E. YATES COMPANY:

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By: WILLIAM F. CARR

* * *

WHEREUPON, the following proceedings were had at 8:22 a.m.:

EXAMINER CATANACH: All right, we'll call the hearing to order this morning for Docket Number 21-00. I will call the continuances and dismissals first.

(Off the record)

EXAMINER CATANACH: And we'll go a little bit out of order this morning, we'll hear the Pogo case first. And at this time we'll call Case 12,463, which is the Application of Pogo Producing Company to amend the special pool rules for the McMillan-Morrow Gas Pool or, in the alternative, for an unorthodox gas well location, Eddy County, New Mexico.

Call for appearances in this case.

MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe, representing the Applicant. I have three witnesses to be sworn.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr, Berge and Sheridan. We represent Harvey E. Yates Company in this matter. I have no witnesses, I have a brief statement.

EXAMINER CATANACH: Any additional appearances?

Will the witnesses please stand to be sworn in?

(Thereupon, the witnesses were sworn.)

GARY LANG,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name for the record?

A. Gary Lang.

Q. Where do you reside?

A. In Midland, Texas.

Q. Who do you work for and in what capacity?

A. I work for Pogo Producing Company as a consulting landman.

Q. Have you previously testified before the Division?

A. Yes.

Q. And were your credentials as an expert petroleum landman accepted as a matter of record?

A. Yes, they were.

Q. And are you familiar with the land matters involved in this case?

A. Yes.

MR. BRUCE: Mr. Examiner, I tender Mr. Lang as an expert petroleum landman.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Bruce) Mr. Lang, could you identify

Exhibit 1 for the Examiner?

A. Exhibit 1 is a land map showing our acreage and also the area of the McMillan-Morrow Gas Pool.

Q. What are the rules governing this pool?

A. The pool rules are spaced -- 640-acre spacing, with wells no closer than 1650 feet to the outer boundary of the well unit, and there's one well allowed per unit.

Q. And Mr. Lang, are the pool rules restricted to these five sections of land?

A. Yes, they are.

Q. Okay, so they don't apply to anything within a mile of the pool?

A. No, these five sections.

Q. How many active wells are there in the pool at this time?

A. Right now there are three wells. There's a well in Section 13 operated by Yates Drilling, there's a well in Section 19 that's operated by Itasca Resources, and then we just recently -- Pogo just recently drilled a well in the south half of Section 7.

Q. What is the unit for Pogo's well?

A. It's a 320-acre unit. The South half of Section 7 was approved as a nonstandard unit by Order Number 11,308.

Q. Okay. Did that order also approve an unorthodox

location for the well?

A. Yes, 660 from the south and west lines of the section.

Q. What is the status of the north half of Section 7?

A. Well, Harvey E. Yates Company has requested approval for a nonstandard unit for the north half of 7 and an unorthodox well location, and this matter is to be heard on the August 10th docket.

Q. Does Pogo object to that Application?

A. No.

Q. Does Pogo intend to drill another well in this pool?

A. Yes, we plan on drilling another well in Section 18, to be located 660 from the north and west line.

Q. What does Pogo seek in this case?

A. Well, what we're seeking -- We're not seeking to request a change in the spacing, but we are requesting that the location be relaxed to allow four wells per section, with wells to be no closer than 660 to a quarter-section line, nor closer than 10 feet to a quarter-quarter section line, and this will conform the pool to the statewide rules.

But we are asking that the nonstandard units in Section 7 be recognized so that Pogo and Heyco each operate

their own wells.

Q. In the alternative, if that was not granted, would Pogo request an unorthodox for its Davis "18" Number 1 well?

A. Yes, uh-huh.

Q. Okay, let's move on. What does Exhibit 2 show, Mr. Lang?

A. Okay, Exhibit 2 just shows a list of the lessees or operators of the well units or sections within the pool, as well as lessees or mineral owners in Section 12 offsetting the proposed well.

Q. Okay, and Section 12 was notified because of the potential unorthodox location approval; is that correct?

A. Yes.

Q. Okay. What is the status of that Section 12 acreage?

A. Well, it's outside the units governed by Division statewide rules, so they can drill a well 660 from the corner without any special approval from the Division.

Q. Okay. Were all of these interest owners on Exhibit 2 notified of this hearing?

A. Yes.

Q. And is Exhibit 3 my affidavit of notice with the notice letter and return receipts?

A. Yes, it is.

Q. Were Exhibits 1 through 3 prepared by you or under your supervision or compiled from company business records?

A. Yes, they were.

Q. And in your opinion is the granting of this Application in the interests of conservation and the prevention of waste?

A. Yes, it is.

MR. BRUCE: Mr. Examiner, at this time I'd move the admission of Pogo's Exhibits 1 through 3.

EXAMINER CATANACH: Exhibits 1 through 3 will be admitted as evidence.

Mr. Carr, do you have any questions?

MR. CARR: I have no questions.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Lang, let me just get this clear. You want 660-foot setbacks from the outer boundary?

A. Yes.

Q. And 10 foot from the inner boundaries?

A. Yes, correct.

Q. And you want the option of drilling four wells per section?

A. Yes.

Q. Now, this pool is actually larger than what

you've got mapped here, is it not.

A. The McMillan-Morrow Pool just consists of these five sections in the dark red outline.

MR. BRUCE: Mr. Examiner, there are some wells -- and maybe Mr. Hardie could point them out, our next witness -- that were considered within the pool itself, but the 640-acre spacing provisions only apply to these five sections of land.

Q. (By Examiner Catanach) Okay, and as far as notice, you gave notice to all of the interest owners within these five sections?

A. Yes, that's correct, we did.

Q. Anybody outside of these sections?

A. Section 12, we notified all the mineral owners and lessees in Section 12, which is outside the unit -- which is outside the pool, because it's an offset to our Davis "18" Number 1 well.

But all the ones in 7, 13, 24 and 19 were notified.

MR. BRUCE: Mr. Examiner, if I could expand a little bit on that, since everything outside is on statewide rules, I don't know that we were required to give notice.

Furthermore, I don't think there are any Morrow wells within a mile, producing Morrow wells within a mile

of this pool.

EXAMINER CATANACH: Everything outside the pool boundaries is on statewide, which means they do have the option of drilling four wells per section, or two wells per 320.

MR. BRUCE: That's correct, Mr. Examiner.

EXAMINER CATANACH: And the setbacks would be the same 660. Okay.

Q. (By Examiner Catanach) In Section 24, what is the status of that well that --

A. It's plugged.

Q. P-and-A'd?

A. Pogo and Devon both own leasehold in there, but it was a new lease we took about a year ago.

Q. Okay. And the two wells in Section 18, those are also plugged?

A. Yes.

Q. Okay. Which of these wells in the south half of Section 7 did you recently drill?

A. It's in the southwest southwest. The other two are plugged.

EXAMINER CATANACH: Okay, I don't have any further questions.

This witness may be excused.

MR. BRUCE: Call Mr. Hardie to the stand.

WILLIAM E. HARDIE,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name and city of residence?

A. My name is Bill Hardie, I live in Midland, Texas.

Q. Who do you work for?

A. I work for Pogo Producing Company.

Q. What's your job there?

A. I'm a senior geologist.

Q. Have you previously testified before the Division as a geologist?

A. Yes, I have.

Q. And were your credentials as an expert accepted as a matter of record?

A. They were.

Q. And are you familiar with the geology involved in this matter?

A. I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Hardie as an expert geologist.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Bruce) Mr. Hardie, could you identify

your Exhibit 4 and describe the geology, Morrow geology, in this area?

A. Exhibit 4 is actually two maps that I've combined into one. It has two sets of contours. The first is a structural contour on the producing sand within the McMillan-Morrow Gas Pool, and that surface is shown to be dipping to the southeast or to the lower right-hand corner of the map, being the lowest part of the map.

The second set of contours is color-filled, and it represents a gross sand isopach on what I call the Singer sand, which is the discrete producing unit in the Morrow that all the producing wells in the McMillan Pool are completed in. And the colors are such that the lighter shades of green represent thinner sand, whereas the darker shades represent thick sands. And we can see on the map that I've contoured anywhere from 10 to upwards of over 40 feet of sand thickness in this sand.

The sand itself is trending north-south, such that it would have represented a river or a delta channel that was meandering and was flowing from the north to the south, down essentially a regional dip, plain.

I've highlighted an approximate gas-water contact at minus 7100 feet in elevation. The sand is wet below that elevation and gas-productive above it.

So the important item to get from this exhibit is

that the McMillan-Morrow Gas Pool essentially contains this sand. And once you move outside of the pool, there is no more Singer sand based on these contours, with the possible exception of Section 12, which does lie outside of the pool.

It's also important to note that northward development of this sand is going to be inhibited by the fact that the McMillan Lake and the Brantley Lake system exist just to the north of this, so that the sand probably runs underneath those lakes and would be very difficult to develop as a result of that.

Q. Just very briefly, I know they're on your cross-section, which is your Exhibit 5, Mr. Hardie, would you go through the cross-section and describe the status of those wells on your cross-section, when they were drilled, et cetera?

A. Cross-Section A-A', which is Exhibit 5, the orientation and the location of the wells on the cross-section are also shown on Exhibit 4. It's an east-west cross-section across the channel sand.

And on Exhibit 5 you can see I've colored a portion of the Morrow. That's the middle Morrow interval. That contains most of the sands in the McMillan area. There are a lot of sands in the middle Morrow in this part of the world, but unfortunately most of them are either wet

or tight.

The Singer sand, which I've shown on the cross-section in yellow, is the only one that's known to produce commercial quantities of hydrocarbon, and it's the only one that has sufficient porosity to do so.

Basically, this cross-section just shows the configuration of that channel and how most of the better wells, including the Pecos River Deep Unit 13 there in Section 13 and the recently drilled Davis Number 1 well, that Pogo drilled, are in the thickest part of the channel sand, and we consider that crucial to finding commercial hydrocarbons in this trend.

Q. What pressures did Pogo encounter in its Davis "7" Number 1 well?

A. Pressures in the Davis "7" were essentially virgin. I think they were in the neighborhood of 3400 pounds bottomhole pressure.

It may be helpful, I think, at this point if I went over a little bit of the history of the field and what Pogo has been trying to achieve here. This field was discovered in 1964. The discovery well was in Section 18. It's in the northwest corner of Section 18, and it was drilled in 10 of 1964. That well has cum'd about 6 1/2 B's and has since been plugged.

After that well was drilled in 1964, there was a

lot -- several other wells drilled in the pool, including the well drilled in the east half of Section 13, was drilled a month after the initial discovery well. That well is still producing. It's made just over a BCF of gas in the 30 or 35 years that it's been producing.

There was also a well a well drilled in the southeast corner of Section 7 in the early 1960s. That was a completed but noncommercial well.

And then there were two wells drilled in the late 1960s, one in Section 24 and one in Section 19. The well in 19 is still producing and has cum'd almost 2 1/2 B's since it was completed. Those were both drilled in the late 1960s.

And that was essentially the status of the development of the field until 1976, when Heyco drilled in the south half of Section 7. I'm particularly referring to the well that's in the northeast of the southeast quarter of Section 7. They found 19 feet of sand in that well.

And the key to that well, as far as Pogo was concerned, was that they had a shut-in wellhead pressure that reflected nearly virgin pressures. This was in 1976. At that point in time, the whole pool had produced about 11 BCF, and it's only made about 12 BCF to date. So most of the reserves had already been produced by 1976, and we were seeing virgin pressures in that wellbore. The reason it

wasn't commercial, we felt, was that the sand thickness was insufficient for commercial production.

That's when Pogo came in and drilled the Davis "7" Number 1 there in the southeast corner of Section 7. We encountered, again, near-virgin pressures in that wellbore, despite the fact that it's located very close to a well in Section 18 that's made 6 1/2 BCF.

We think this confirms our suspicion that the pool is underdeveloped and that it supports a need for infill development within the pool, and we would like to bring it within the same development criteria that are used on statewide Morrow -- or Morrow pools.

Q. Based on your mapping, is it your opinion that there are additional drillable locations within this pool if the rules, the well-location rules, are relaxed?

A. Yes, there are. There are several additional drilling locations available, based on the current mapping. This is, of course, a risky play, as are any Morrow drilling plays, simply due to the fact that the sand itself can be tight, even though it is thick, and it's very easy to drill a dry hole, even if you are in the main channel body.

Q. In your opinion, is the proposed location for the Davis "18" Number 1 a well location which would minimize the risk in drilling that well?

A. Yes, it does. We picked this location primarily to minimize risk, putting it as far away as we felt feasible from the existing old producing wells in Section 13 and 18, and also close enough to the Davis "7" Number 1 that we would encounter the same reservoir conditions that that wellbore had encountered.

Q. Let's move on to your final exhibit, Mr. Hardie, and just briefly go through what that exhibit shows.

A. That would be Exhibit 6. I've included this primarily to give the Examiner a regional perspective of the Morrow-producing trends in relation to the McMillan-Morrow Gas Pool.

Near the top of the map I've outlined the pool in kind of a purple color. And as you can see on this map, it lies well outside of the producing Morrow trends farther south and just north of the City of Carlsbad. So it is an isolated development of Morrow production, and there are currently no producing Morrow wells within a mile of the pool.

I would also caution you that this map does not include all of the dry holes and other penetrations. It just includes bubbles that represent Morrow-producing wells.

Q. Looking at this map, there's a well just to the southwest of the unit in Section 26. Could you just

briefly describe what that well produced from?

A. That well produced from one of the other stray sands in the middle Morrow, not the Singer sand, and I believe at the time that it was drilled and completed in the Morrow they included it the pool, although it wasn't a 640-acre-spaced unit at the time. It's since been produced to depletion and plugged back to, I believe, the Cisco formation.

Q. Okay. But what you stated is, these are only Morrow-producing wells. There are a significant number of Morrow dry holes surrounding this pool, are there not?

A. Yes, there are.

Q. Mr. Hardie, in your opinion is the granting of Pogo's Application in the interests of conservation and the prevention of waste?

A. Yes, it is.

Q. And were Exhibits 4, 5 and 6 prepared by you or under your direction?

A. Yes, they were.

MR. BRUCE: Mr. Examiner, I'd move the admission of Pogo Exhibits 4 through 6.

EXAMINER CATANACH: Exhibits 4 through 6 will be admitted as evidence.

Mr. Carr, any questions?

MR. CARR: No questions.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Hardie, do you know what the virgin pressure of this reservoir was from the discovery well?

A. I believe when the discovery well was drilled that there were some shut-in wellhead pressures that exceeded 3400 pounds, but I'm relying on my faulty memory for that. I'm not sure that there was ever actually an accurate bottomhole pressure taken in the initial discovery wells that's at least available on the public record.

Q. Well, you made the statement that your Davis "7" Number 1 well encountered virgin pressures, so I --

A. Virgin wellhead pressures in the sense that our shut-in wellhead pressures are very similar to what they encountered on those original wells that were drilled back in the 1960s. There may have been some depletion, but if there was it was certainly less than 1000 pounds of pressure depletion over that period of time, small enough that we can't necessarily detect it without taking an accurate bottomhole pressure measurement, which we have not yet done in the Davis well.

Q. What do you attribute this to? Are there some geologic factors that contribute toward this?

A. Well, a lack of adequate permeability to drain large areas would be the obvious explanation, and that's

what we felt when we asked for the original unorthodox location in Section 7.

Other possible explanations would be some small-scale faulting which has acted to isolate the sand reservoir in a pressure sense. But we have no evidence of that, and we do have seismic across this area, none of which shows any faulting, but there could be faults on the order of 30 to 40 feet of throw that could isolate this reservoir, that could be invisible seismically. So that is a possibility.

I think perhaps a combination of both those is really what's at work here.

Q. Well, did you find evidence of low permeability in your new well?

A. It shows evidence of low permeability, such that we think, based on the permeability that we saw in the well, that we can justify infill development on this reservoir. It's not high enough that it's draining large areas.

The well is currently producing at a rate of 7 million a day, and I think it's making about 80 barrels of condensate. It's got a flowing tubing pressure of about 2400 pounds right now. It's not a spectacular well in the sense that it's making in excess of 10 million a day. It's a good well, but high-permeability Morrow wells are capable

of higher rates than that. The main reason that it's making that current rate is, quite honestly, because of the high pressure that we encountered, not because of the high permeability.

Q. How does that compare to the discovery well? Do you know what that originally made?

A. I know that that made in excess of 10 million a day when it was initially completed. It's tough to get those early production rates, but there were some records that showed it making more than 10 million.

Q. Do you have an opinion as to how many feet of net sand you'd have to encounter in this reservoir to make a well?

A. That's again one of the problems we face with such an old field, is that the logs were taken in the early 1960s. Most of them were either sonic logs or gamma-ray neutron logs, and it's very difficult to get accurate porosity measurements from those. The only modern log we have, essentially, is our own, and it has an average of about 12-percent porosity across the sand. It's about 30 feet thick in that well.

In future drilling we would like to see a gross sand thickness in excess of 20 feet, and that's what we'll aim for, I think, in future development, mainly because we don't have yet the ability to predict whether or not it's

going to have sufficient perm. But of course we know that the chances are good if we've got more than 20 feet, just based on the existing completions.

Q. Is this sand that you mapped -- is this gross or net?

A. That's gross.

Q. That's gross. Well, you've got a well in Section 7 that encountered 19 feet of gross that was apparently not commercial?

A. That is correct. That's the well that, if you look on the log, you can tell the sand looks a little bit dirty, even though there were 19 feet of it. But it's also the well that had, back in 1976, indications of virgin or near-virgin reservoir pressures. That was a key well to us. We felt like perhaps with modern frac stimulation it could have been a commercial completion.

Q. Where are your additional locations that you may drill in this pool?

A. Well, just looking at the map, in terms of Pogo's acreage, I would say we would be looking obviously at first drilling the Davis "18" Number 1. That's our proposed location for this hearing. We may end up drilling, if that is successful, in the southwest quarter of Section 18, maximizing sand thickness and structural elevation, and also probably trying to stay as far away from the 6-1/2-BCF

well as we could, balancing those. Pogo owns, jointly with Devon Energy, Section 24, and I can see at least two locations along the thickest part of the sand there in Section 24, somewhere in the north and south halves.

And of course there are opportunities for some of the other operators, I feel, to drill infill development wells in this pool, the main one being Yates Drilling there in Section 13.

Q. The location for the Davis "18" Number 1, now, that's -- you want to move that to -- Is that 660?

A. 660 from the north and west.

Q. And the reason being is, you want to move away from the discovery well?

A. That is correct.

Q. I assume you have some drainage data for the discovery well that will be presented?

A. The reservoir engineer for Pogo will present that information.

Q. Okay. And do you believe that location will encounter that thick sand?

A. I do. I'm always concerned about the risk of porosity. Just because you have a thick sand doesn't guarantee sufficient porosity for commercial productivity, but of course staying as close to our known high-porosity well in the Davis "7" is a priority.

It's also important to point out that we've got one modern data point in this pool, with our well in Section 7. One of our goals is to gather additional information as to how to most efficiently develop this pool, and we feel like the location in the northwest of Section 18 would achieve that. It will be another modern data point that we compare and use to determine how we develop the pool

Q. Some of the other sands that are in that middle Morrow section, do you anticipate them being productive in your new well?

A. I do not, although if you look on Exhibit 5, the cross-section, you can see that most of the completions back in the 1960s were actually open-hole completions that exposed not only the Singer sand but also a multitude of the other sands in the middle Morrow section. Many of those sands have actually tested -- been isolated and tested elsewhere and shown to be wet. Some of these operators, I think, were fortunate in the fact that those sands that were probably wet were also tight, so they didn't contribute a lot of water to the producing well.

But most of those sands calculate to be wet, and most of them are also looking pretty tight on these old logs.

Q. Development to the south of the pool is likely to

be -- Well, there's not likely to be much development; is that your opinion, because of the -- it could be wet in the Singer sand?

A. Yeah, there's a couple of specific DST's where they isolated this very sand and tested a lot of water. They did that in Section 30 in the north half, in that well, and I believe they also tested it there in Section 31, where you see a well there in the south half with 38 feet of net sand. Both of those tested large amounts of water, if my memory serves correctly. That's pretty well defined.

You know, there is some leeway on where that gas-water contact lies. You've got a producing well there in the northwest corner of Section 19, and then you've got your wet well in the north half of Section 30. Somewhere between those two wells is the contact. My current map shows that to be pretty conservatively drawn at minus 7100 feet, but I can't actually pick that on well logs. It's not something I can identify that precisely.

EXAMINER CATANACH: I have nothing further of this witness. You may be excused.

CHAIRMAN WROTENBERY: Mr. Examiner, can I interrupt for just a moment?

EXAMINER CATANACH: I suppose.

CHAIRMAN WROTENBERY: We'll go off the record

here for just a moment.

(Off the record)

EXAMINER CATANACH: Okay, let's continue, shall we?

RON GASSER,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name for the record?

A. Ron Gasser.

Q. Where do you reside?

A. Midland, Texas.

Q. Who do you work for and in what capacity?

A. I work for Pogo Producing Company, and I'm the division petroleum engineering manager.

Q. Have you previously testified before the Division?

A. Yes.

Q. And were your credentials as an expert engineer accepted as a matter of record?

A. Yes.

Q. And are you familiar with engineering matters related to this Application?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Gasser as an expert petroleum engineer.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Bruce) Mr. Gasser, could you refer to your Exhibit 7 and describe for the Examiner what those two pages show?

A. The first page of Exhibit 7 is a production plot for the McMillan-Morrow Pool, beginning in 1970. It shows that cumulative production from the pool has been about 12 1/2 BCF, and as of the date of production for *Dwight's*, where this data was retrieved, they only show two producing wells in the field.

The second page is a tabular presentation of the wells which make up this production. You can see that *Dwight's* includes seven wells in the pool and that only two of those are active. And it has the cumulative production from each well.

Q. Okay. Why don't you move on to your Exhibit 8 and describe production and the area drained by the wells in the pool?

A. Exhibit 8 is basically the same plot, except that it does include the most recently completed Davis "7" Number 1 production, and you can see that production from the pool has jumped from its 200 MCF a day to 7 million a day, 7.2 million a day. And I've included on there the

declines that we currently anticipate seeing from the field.

Incorporated with that on the second page is a volumetric calculation, which incorporates the gravity and the condensate and the reservoir temperature and an initial of 4235 pounds, an abandonment pressure of 500 pounds. The average net pay for the field, we've used 20 feet, a water saturation of 25 percent, and we've estimated a 20-percent porosity for the pool.

That matches the decline and ultimate recovery currently expected from the pool of 15 BCF and thereby generates a drainage acres for the entire pool of 1009 acres.

And if you are to divide back into that 1009 acres the eight wells that are included in the pool, that calculates to be 144 acres per well for average drainage expected at this condition.

Q. Why don't we move on to your final three exhibits together, 9, 10 and 11, and discuss the specific wells in the pool and their drainage?

A. Exhibits 9, 10 and 11 are production plots and the associated drainage-area calculations for the three remaining producing wells in the pool.

The Pecos River Deep, which is currently producing at about 150 MCF a day, is expected to recover

1.7 BCF of gas and drain approximately 72 acres.

Exhibit 10 is the State "19" Com, currently producing at about 60 MCF a day. It's expected to recover 2.4 BCF of gas and drain approximately 234 acres.

Exhibit 10 [*sic*] is the newest well in the field, it's our Davis "7" Number 1, currently making 7 million a day. We expect it to make an EUR of approximately 1.8 BCF of gas and drain 90 acres.

Q. Based on these figures, do you believe that additional drilling is needed in this pool to produce the reserves that are in the reservoir?

A. Yes, I do.

Q. Were Exhibits 7 through 11 prepared by you or under your supervision?

A. Yes, they were.

Q. And in your opinion is the granting of Pogo's Application in the interest of conservation and the prevention of waste?

A. Yes, it is.

MR. BRUCE: Mr. Examiner, I'd move the admission of Pogo Exhibits 7 through 11.

EXAMINER CATANACH: Exhibits 7 through 11 will be admitted as evidence.

Mr. Carr, do you have any questions?

MR. CARR: I have no questions.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Gasser, do you have anything to add to the geologist's testimony as far as the reservoir pressure is concerned?

A. No, it's basically an estimate. My reservoir pressure, initial pressure, of 4235 pounds was obtained from *Dwight's Energydata*. I think the way they calculate that number is, they take the surface pressures and try to take them downhole, to give you a bottomhole initial reservoir pressure.

So with my drainage calculations I started with that initial pressure for the pool.

Q. And that was for the well in Section 18?

A. Yes. Yes, Section 18, the 6.4-BCF well that's currently abandoned.

Q. Okay, and that pressure, you said, was 4235?

A. Yes, that's correct.

Q. And the pressure you encountered in the Davis "7" Number 1?

A. We shot the well with the tubing full of nitrogen, and the initial shut-in tubing pressure that it built up to was 3200 p.s.i.

Q. The drainage area that you've calculated for the Davis "7" Number 1, that doesn't take into account, does

it, the well that you plan on drilling in Section 18? Would that reduce the recoverable reserves for that well?

A. No, I don't believe so, and that's one reason why we used only 90 acres. The drainage area that's calculated based off the production from the field ranges from a couple of acres on the tight wells to a maximum of 234 acres on the State "19" well. So there's a great variance in what these wells will drain, and I think that's more a function of net sand thickness and permeability than anything else.

And you can tell that with our Davis "7" Number 1 we did get 36 feet of sand, but as Mr. Hardie testified, we believe that it is somewhat tight and may have limited drainage. And until we get further reservoir data, we feel comfortable with our 90-acre drainage. It's not cast in stone; it will change with performance of the well, I'm sure.

Q. And you've estimated 1.8 BCF recoverable for that well?

A. Yes.

Q. Have you done any estimates for the Davis "18" Number 1?

A. No, I have not. I would assume that it would be a well similar to the Davis "7" Number 1, though, and that's principally why we're picking that location.

Q. Okay, let's see. The discovery well, what was the drainage area on that one?

A. I didn't present that to you. I do have it here, though. Based off of this 6.4-BCF recoverable, we estimate that it should have drained 216 acres. That's with a net pay of 40 feet, a water saturation of 25 percent and a porosity of 10 percent.

Q. Was there a reason why that wasn't submitted?

A. No. Well, yes, the reason it wasn't submitted is, I was just presenting the decline curves and volumetric calculations for the producing wells in the field. And it does conform with basically what we would expect for a better-than-average well in the field. It's not the largest drainage area, but it is the second largest in 216 acres.

Q. Well, given the fact that that drains 216 acres, do you still feel that there's reserves in that northwest quarter that you can recover by a new well?

A. Yes, we do. If you were to take and assume that it was a perfect circle that it drained, then there is a spot in the corner that would be undrained, not much of one.

But looking at the Exhibit 4 and the gross thickness map that Mr. Hardie's made, and looking at the performance of the wells and inferring permeability from

performance, which then you go to try to determine what the actual drainage would be, I envision that it should be more along the shape of his net-pay map, rather than a perfect radius. It should fall along the contours of the reservoir and be in more of a northeast-to-southwest drainage situation.

Q. Is it your opinion that four wells will be necessary per section to drain the remaining reserves?

A. Well, I believe each well would need to be considered on a case-by-case basis, based off of the risk that's included in drilling Morrow wells, especially in this location. And it also depends on the mapping that you see. Obviously in Section 18, if you were to space four wells throughout Section 18, in the east half of Section 18, they become probably rather risky and you won't be drilling over there.

But it's rather obvious to us that there is economic gas to be recovered from this pool, based off of the performance of the "7" 1, and we're just hoping to drill more wells, get more modern data and get some more permeability information and direction of the channel so that we can exploit the reserves from this reservoir.

Q. Well, in your opinion, would it be sufficient to allow, say, one infill well per section instead of four? Instead of a total of four wells, have a total of two wells

per section? Is that reasonable? Or do you see an area where there may, in fact, be three or four wells per section?

A. Well, I can -- You know, in Section 18 you can see that with a 6.4-BCF well, it hasn't drained any of the reserves that are only 320 acres away. So I believe that the compartmentalization or the actual channel location of the sand should allow for four wells per section. I envision this as being no different than any other Morrow pool in the State of New Mexico, basically, and we ought to be under statewide regulations.

Q. Do you know why this pool was originally spaced on 640 acres?

A. No, I don't. I've read over the testimony and the field rules, and I've yet to determine exactly what they were thinking.

Q. Was it based on the discovery well?

A. Yes.

Q. But they didn't present any evidence at the original hearing to demonstrate that large a drainage?

A. Not that I could tell.

Q. Hm. And this was back in 1964?

A. The hearing testimony that I was reading was in 1978. Now, I don't know if that was for the initial or if it was for a subsequent three hundred -- I believe it was

for a 320-acre pool, infill location, was the testimony I was going off of.

Q. You don't recall which well that was?

A. No.

Q. So in your -- you believe that -- Was this pool originally 320, based on the discovery well, and somebody came in later on? Is that what happened?

A. Yeah, I believe they came in later on and applied for field rules to set it up on 640-acre drainage.

Q. That's interesting. You don't have any of the other reservoir pressures that were encountered in any of these other wells, do you?

A. No, I do not. Most of the data that I'm working off of is *Dwight's* data, and they'll generally have with their production a P/Z plot, and as I said earlier, calculated off of surface pressures that are turned in on the Commission paperwork.

EXAMINER CATANACH: I have nothing further of this witness. Mr. Bruce, is there anything further?

MR. BRUCE: Just two things, Mr. Examiner. One thing that Mr. Lang pointed out and he can testify to, is that there is, if you look at Exhibit 1, even though all this acreage colored yellow is acreage in which Pogo has an interest, there are different royalty owners and mineral owners in the different sections, 7 versus 18 versus 24,

which is one reason Pogo feels compelled to develop Section 18 as wells as Section 7.

And the other thing was, I did not bring it with me, I believe there was a hearing in the 1960s to increase the spacing to 640 acres and then a subsequent hearing about a decade later to limit the areal extent of the special pool rules.

EXAMINER CATANACH: Is that it?

MR. BRUCE: Yes, sir.

EXAMINER CATANACH: Mr. Carr?

MR. CARR: May it please the Examiner, Pogo Producing Company and Harvey E. Yates Company are in agreement concerning the development of Section 7, Township 20 South, Range 27 East. Mr. Bruce provided me a letter yesterday which memorializes that agreement. It is consistent with Pogo's testimony here today, but Heyco has requested that I provide you with a copy and ask that this letter just be included in the record of this proceeding.

EXAMINER CATANACH: Okay, this letter shall be included in the record.

Okay, there being nothing further in this case, Case Number 12,463 will be taken under advisement.

(Thereupon, these proceedings were concluded at 9:20 a.m.)

I do hereby certify that the foregoing is a complete record of the proceedings in the examiner hearing of Case No. 12463 heard by me on May 27 1993.

David R. Catanach, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL July 28th, 2000.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002