NEW MEXICO OIL CONSERVATION DIVISION

STATE LAND OFFICE BUILDING

STATE OF NEW MEXICO

CASE NO. 10412

IN THE MATTER OF:

The Application of MW Petroleum Corporation/Apache Corporation to amend Division Order No. R-9487-A, Eddy County, New Mexico.

BEFORE:

MICHAEL E. STOGNER

Hearing Examiner

State Land Office Building

November 21, 1991

REPORTED BY:

DEBBIE VESTAL
Certified Shorthand Reporter
for the State of New Mexico

ORIGINAL

EXAMINER STOGNER: At this time I will call the next case, No. 10412, which is the Application of MW Petroleum Corporation/Apache Corporation to amend Division Order No. R-9487-A, Eddy County, New Mexico. Said order authorized the drilling of a well at an unorthodox gas well location in Unit E of Section 12, Township 22 South, Range 23 East in the Indian Basin Upper Pennsylvanian Gas Pool.

At this time the applicant specifically seeks to amend the gas allowable acreage factor assigned to the well by said order. However, the applicant has requested that this case be continued to the Examiner Hearing scheduled for December 5, 1991, which is scheduled for this room, in Santa Fe, New Mexico.

Case No. 10412 is therefore continued to the Examiner's Hearing scheduled for December 5.

(And the proceedings were concluded.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10412 heard by me on 31 October 1991.

, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

I, Debbie Vestal, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I caused my notes to be transcribed under my personal supervision; 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 NOVEMBER 27, 1991.

Debbie Vestal

DEBBIE VESTAL, RPR
NEW MEXICO CSR NO. 3

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BEFORE:

DAVID R. CATANACH

Hearing Examiner

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December 5, 1991

REPORTED BY:

DEBBIE VESTAL
Certified Shorthand Reporter
for the State of New Mexico

ORIGINAL

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EXAMINER CATANACH: At this time we'll call Case 10412.

MR. STOVALL: Application of Yates -- Application of MW Petroleum Corporation/Apache Corporation to amend Division No. R-9487-A, Eddy County, New Mexico.

EXAMINER CATANACH: Are there appearances in this case?

MR. CARR: May it please the Examiner, my name is William F. Carr with the law firm of Campbell, Carr, Berge & Sheridan of Santa Fe. I represent MW Petroleum Corporation in this case, and I have two witnesses.

EXAMINER CATANACH: Other appearances?

MR. BRUCE: Mr. Examiner, my name is James Bruce from the Hinkle law firm in Albuqueruqe, representing Musselman, Owen & King Operating, Inc. I have one potential witness.

EXAMINER CATANACH: And other appearances?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin, of the Santa Fe law firm of Kellahin, Kellahin & Aubrey, appearing on behalf of Marathon Oil Company. I do not have witnesses in this case.

EXAMINER CATANACH: Will the witnesses, potential witnesses, please, stand and be sworn in.

(The witnesses were duly sworn.)

MR. CARR: At this time I call Ceci Leonard.

CECI SEARLS LEONARD

Having been duly sworn upon her oath, was examined and testified as follows:

EXAMINATION

BY MR. CARR:

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

A. My name is Ceci Leonard.

Q. And would you spell "Ceci" for us?

A. C-e-c-i.

Q. Where do you reside?

A. In Houston, Texas.

Q. By whom are you employed and in what capacity?

A. I'm employed by Apache Corporation as a Senior Staff Reservoir Engineer.

Q. Have you previously testified before this Division and had your credentials as a petroleum engineer accepted and made a matter of

record?

A. Yes, I have.

Q. Are you familiar with the application filed in this case on behalf of MW Petroleum Corporation?

A. Yes, I am.

Q. And are you familiar with the well that is the subject of this hearing and the area that surrounds the well?

A. Yes, I am.

MR. CARR: Are the witness' qualifications acceptable?

EXAMINER CATANACH: They are.

Q. (BY MR. CARR) Would you briefly state what MW seeks with this application.

A. MW seeks to amend the gas allowable acreage factor assigned to our recently drilled Smith Federal Gas Com. No. 2 well.

Q. And that was approved by Division Order No. R-9487-A?

A. Yes, it was.

Q. And a penalty was imposed on the well by that order?

A. Yes, it was.

Q. What is the location of the Smith

Federal Gas Com. Well No. 2?

A. The well is located 2,049 feet from the north line and 480 feet from the west line of Section 12.

Q. This is in 22 South, 23 East?

A. Yes, it is.

Q. And in what pool is the well completed?

A. It's Indian Basin-Upper Penn gas pool.

Q. What are the spacing and well location requirements for this pool?

A. The spacing is 640 acres per well, and the setback requirements are 1650 feet from the section line boundaries.

Q. Is this a prorated gas pool?

A. Yes, it is.

Q. So any penalty that is imposed on the well can be applied to the acreage factor in the allowable formula?

A. That's correct.

Q. Could you refer to what has been marked as MW/Apache Exhibit No. 1 and first identify that and then review it for the Examiner. And in so doing, I think it would be helpful if you would provide some general background on this well and how we got to the hearing today.

A. Exhibit No. 1 is a Form C-102, a well location and acreage dedication plat. This was the one that was filed on the Smith Federal Gas Com. No. 2.

I'm going to first tell you a little bit about the history on how MW Petroleum came to be. Amoco Corporation was the original owner of the properties in Indian Basin. They assigned their interest to a subsidiary of theirs called MW Petroleum a couple of years ago.

Then Apache Corporation bought MW Petroleum from Amoco effective July 1 of this year. So all of the MW Petroleum properties are now wholly-owned by Apache Corporation.

Q. All right. Now, when was the Smith Federal No. 2 well originally proposed, and how was it proposed?

A. Amoco, in April of 1991, originally proposed that we sidetrack or that a well be sidetracked from the Smith Federal Gas Com. No. 1 location to a bottom-hole location window that you see on this plat. The boundaries of that window are 330 feet to 430 feet from the west line and 1800 to 2000 feet from the north line of the section.

In July they reentered the Smith Federal Gas Com. No. 1 and found that the casing could not take being reentered. There were numerous casing leaks in the intermediate casing, and so the well was plugged and abandoned.

Then in August of 1991 Apache came before this Commission and requested a straight-hole location, that straight-hole being the 480 feet from the west line and the 2049 feet from the north line.

The Commission did grant our application. And Apache drilled this well in October of this year.

Q. When the well was originally approved on the Amoco application, what penalty was imposed by the Division on that well?

A. A 0.49.

Q. When you came back and proposed the straight hole in lieu of the deviated hole, did you request the same penalty?

A. Yes, we did.

Q. And you received approval to drill a straight hole at that location?

A. Yes, we did.

Q. Could you explain what happened when

you drilled that well that has brought you back here today?

A. After drilling the No. 2 well, we tested an interval that was below the perforated interval in the Smith No. 1 well. And that interval did test water-free and at commercial gas rates.

As a result of that test, we are now seeking to amend the penalty factor that was imposed in the original order.

Q. Do the input factors that resulted in the penalty in the original order accurately reflect the reservoir as you know it to be today?

A. No, they don't.

Q. Let's go to what has been marked MW/Apache Exhibit No. 2, and I would ask you first to identify that and then review it for Mr. Catanach.

A. This is a structure map on the top of the Penn. It was developed by John Polasek, who is a geologist with our company.

Q. Is Mr. Polasek also going to testify in this case?

A. Yes, he is.

Q. This particular structure map is in the

southeast portion of the Indian Basin gas pool.

Q. Now, before we go into the plat and identify what the underscored numbers are, could you point out the proposed well and then identify the offsetting owners, please.

A. The recently drilled Smith Federal Gas Com. No. 2 is outlined in red in your map. That was the well that was just drilled this October.

The original well in that section is the well that's located just east of that. That's the Smith gas unit No. 1, and that well has been plugged.

Q. All right. Now, that well is at an unorthodox location; right?

A. Yes, it is.

Q. And how is it unorthodox?

A. It's unorthodox in that it is 480 feet from the west line, and the setback requirements are 1650 feet.

Q. The well is encroaching on the tracts to the west?

A. Yes, it is.

Q. Who owns and operates Section 11, the 640-acre tract to the west?

A. MW Petroleum does. This is one of the

properties that was acquired from Amoco. And MW has 100 percent working interest in that Section 11 well.

Q. Is that a federal tract?

A. Yes, it is.

Q. Is the proposed well on Section 12 also located on a federal tract?

A. Yes, it is.

Q. Now, you're required to be 1650 feet back from the outer boundary of the spacing unit?

A. That's correct.

Q. How far are you from the Musselman properties in this area?

A. 2049 feet.

Q. So you're more than the standard setback from them?

A. Yes, we are.

Q. Where are their interests?

A. Their interests are in Section 1 just to the north of Section 12.

Q. To your knowledge do they have any interest in Section 2?

A. To my knowledge they do not.

Q. Do they have any interest in Section 11?

A. No, they don't.
Q. Are any of the interest owners in this area objecting to this well location other than Musselman?
A. No.
Q. And you are more than a standard setback from them?
A. Yes.
Q. You could in fact be 400 feet closer, could you not?
A. That's correct.
Q. Why was a penalty originally imposed on this well; do you know?
A. Not really. The penalty was imposed by Amoco, and that was before we were owners of the property.
Q. And you're still having to live with an order that approves that location but contains a penalty?
A. That's correct.
Q. And you're here today to try and deal with that penalty question?
A. That's correct.
Q. What does the information on this exhibit that is underscored in red indicate?

A. The numbers that are underscored in red are the perforated intervals in the wells. I'd like to first draw your attention to the original well in Section 12, the No. 1 well. It was perforated from a minus 3482 to a minus 3508. Amoco reported that that well had watered out. That was the information they had supplied to us.

Based on that information it was our opinion then that the gas-water contact must be on or around a minus 3500 feet. That caused us to redrill the well as close as we could to the west line in an up-structure location.

Further study of the field, however, did reveal that there were some offsetting information that disputed this minus 3500 gas-water contact.

To the north we have the Musselman and Owen No. 2 well. And it's perforated from a minus 3594 to a minus 3612. This is approximately 100 feet down-structure of the perforations in our original Section 12 well.

To my knowledge the closest water production that is in fact true water production that we have is in the original well in Section

1, perforated from a minus 3585 to minus 3635. And that well did water out, and it was shut in in December of 1985.

We have additional information to the south in Section 13. The Amoco, now MW Petroleum, Hoc Federal Gas Unit No. 1, is perforated from a minus 3648 to a minus 3744. And this well does not produce appreciable amounts of water. And it's perforated to a much deeper interval than even the minus 3600 feet.

Based on those those pieces of information, we did suspect that perhaps the gas-water contact was not at a minus 3500 feet. After the drilling of the Smith Federal No. 2, we decided to test below the interval that had been perforated in the No. 1 well and had reportedly watered out.

Now, I'd like to draw your attention now to our next exhibit, which is Exhibit No. 3.

Q. Let's go to Exhibit No. 3. And then if you would, review the information on that exhibit for Mr. Catanach.

A. Exhibit No. 3 is a log on the recently drilled Smith Federal Gas Com. No. 2 well. And the bottom portion of that log, you'll notice

that there is a perforated interval from 7554 to 7574. The bottom perf is a minus 3588.

Now, the interval was not stimulated, so the gas rates are not staggering. But the well did test 700 million cubic feet a day at 210 pounds with no fluid.

The next exhibit, Exhibit No. 4, is a detail of that well test. And you'll note that there were steady rates produced and that no fluid was produced from this zone. And this zone is 80 feet deeper than the zone that had reportedly watered out in the No. 1 well.

Q. From this information what conclusion can you reach about the gas column in the No. 2 well?

A. The gas column is approximately 100 feet thicker than we had originally thought when the well was proposed.

Q. So this is a difference between what was originally believed and what the actual facts of the particular well have to be?

A. Yes, that's true.

Q. Before we move on from these exhibits, I would like to go back for a minute to your structure map, your Exhibit No. 2. Musselman

operates a well, do they not, in the section north of the section which is involved in this case?

A. Yes, they do.

Q. And what is the location of that well; do you know?

A. That well is located 330 feet from the west line and 1650 from the south line of Section 1.

Q. So it's a standard setback from the common boundary between the two tracts?

A. Yes, it is.

Q. It is 330 feet from its west boundary?

A. That's correct.

Q. Your well is 480 feet from the west boundary?

A. Yes, sir.

Q. Is there a penalty imposed on the Musselman well?

A. Yes, there is.

Q. What is that penalty?

A. I believe that penalty is a 0.57.

Q. They are encroaching toward the west, as your well is also?

A. Yes, they are.

Q. Who operates the tract to the west of the Musselman well?

A. Oryx does.

Q. Is that a federal tract?

A. No. It has some state interests on it. It's a state tract.

Q. Now, your well is also unorthodox to the west?

A. Yes, it is.

Q. Are you encroaching on any other producer?

A. Only our own Smith Federal No. 1, which is located on a federal tract.

Q. Okay. You're also a federal tract?

A. Yes. I would like to explain further what the problem might have been in the Smith gas unit No. 1, the original well that had watered out, or had reportedly watered out in Section 12.

The next exhibit that I have --

Q. That's Exhibit No. 5?

A. Yes, sir. -- is a production curve on the Smith Federal Gas Com. No. 1. And you'll notice that that well was producing a significant volume of gas, over 3 million a day, through the

middle of 1989. And it was essentially water-free through the middle of 1989.

Then in a matter of one month, the well went from no water to 800 barrels of water a day. And then it watered out in six months. This is real inconsistent with the performance of other wells that I've looked at in this field.

Most of the wells take anywhere from four to six years to water out, and they don't experience that kind of increase in water production immediately as this well did.

We suspect that this well did not water out but that in fact suffered from a casing leak. This is further supported by a visual inspection that we made of the casing that was pulled from that well when the well was plugged and abandoned.

The casing was in horrible condition, and it was reviewed by both our production engineer, who is in charge of this area, as well as our production foreman.

Q. At no time when Amoco operated the well were tests run on the casing to determine the integrity?

A. At no time. There is something else

I'd like to point out about the Smith Federal No. 1, and that is --

Q. Just a second. Mr. Bruce is handing me a note saying they are missing exhibits.

MR. BRUCE: We haven't had any of them.

MR. CARR: Okay.

MR. STOVALL: Nice try, Mr. Carr.

MR. CARR: Gosh darn.

A. There was a test prior to the shutting in and temporary abandonment of the Smith Federal Gas Com. No. 1. The well was tested at a sub-sea level of about a minus 3610. And it did test all water with no stimulation.

I personally do not feel that the test was valid. They still never checked for a casing leak in this well. I don't think that that water came from that zone that was perforated, but nonetheless that was below a minus 3610 feet, which is where we suspect our lowest known gas to be at the present time.

Q. Ms. Leonard, if you're not encroaching on any other producer, why are you seeking a penalty on the production for the well at this new location?

A. We're seeking a penalty because that's essentially what we inherited from Amoco.

Q. Let's go to what has been marked as your Exhibit No. 6, and I would ask you to identify that, please.

A. Exhibit No. 6 is an acreage factor calculation for the Smith Federal Gas Com. No. 2. And this calculation is consistent with that that Amoco had calculated in April of this year.

We did include the new information as a result of the testing of the well and as a result of the new location of this well compared to what was believed at that April hearing.

Q. This exhibit then is simply the same method presented by Amoco in previous hearings using current information on the well?

A. That's correct.

Q. Now, there are basically three factors in this; is that correct?

A. That's correct.

Q. Let's go to the first one, the productive acreage method. Could you explain how you did that?

A. I took the amount of area or acreage up-dip of a minus 3600 feet sub-sea, which is

what we currently suspect is our lowest known gas, and the amount of that area is 500 acres. And this is approximately 78 percent of the 640-acre section.

Q. Now, the next thing you have is a two-circle method. Why did you use the two-circle method?

A. Again, I used the two-circle method because this is what was used by Amoco in the past.

Q. And just explain how you used this factor.

A. The two-circle method, we drew a 500-acre circle, which is the amount of productive area, around the existing location and around the nearest legal location or regular location. And then you look at the amount of area that lies outside of that which would be drained by a regular location.

And as it turns out from this calculation, 77 percent of the proposed or the existing drainage pattern is within the correlative rights of the gas unit.

Q. Now, let me ask you, when you drilled the circle around the well at the unorthodox

location, you actually were drawing that circle farther away from Musselman than the original circle at the standard location?

A. That's correct.

Q. And you have additional drainage area. Was any of that on the Musselman tract, or was there actually less on that tract?

A. Well, there's actually less on this tract than was originally proposed by Amoco.

Q. And is there less than you would have if the well were moved to a 1650 location off their lease line?

A. Yes, sir.

Q. All right. Let's go to the distance-ratio method, and I'd ask to you explain what you mean by that.

A. That's simply the setback to the nearest boundary over the legal setback. It's that ratio. And we are 480 feet from the west line, and 1650 is the standard setback. And that ratio is 29 percent.

Q. And then what did you do with all these factors?

A. I simply averaged all three factors and came up with the 61 percent penalty factor.

Q. Are you recommending a 61 percent penalty?

A. No, I'm not.

Q. What are you recommending?

A. I'm recommending a 77-and-a-half percent penalty factor.

Q. How do you get that?

A. By averaging the productive acreage and the two-circle method, the average of those two factors is 77-and-a-half percent.

Q. Do you think a penalty of 77 percent would be more realistic based on what you understand of the reservoir?

A. Yes, I do.

MR. STOVALL: Mr. Carr, if I may clarify, are you talking about a penalty production factor?

MR. CARR: A production factor of that.

MR. BRUCE: An allowable.

MR. CARR: An allowable factor of 77 percent.

MR. STOVALL: Just to make sure. We don't penalize you the amount you want to be able to produce.

MR. CARR: I'm sure we would go de novo

if that happened, and they would have Mr. Kellahin here representing them when they straightened it out.

Q. (BY MR. CARR) In your opinion will approval of this application -- would approval of the application without a penalty result in MW and Apache gaining an unfair advantage on offsetting tracts?

A. No, I don't believe so.

Q. And why is that?

A. The only tract upon which we are encroaching is Section 11. That is an MW Petroleum tract. We have 100 percent of that, and it's also a federal leasehold. So there is -- we're willing to accept that. There is a significant amount of productive acreage remaining in Section 12. This is a competitive reservoir.

Q. Would approval of the application with no penalty permit you to gain an advantage on any offsetting producer?

A. No, sir.

Q. Would a 77 percent penalty in your opinion enable you to produce the well, trying to honor the penalty that was previously imposed,

and at the same time adjusting the productive acres that you now believe to be under the tract?

A. Yes, sir.

Q. Could you identify Exhibit No. 7, please.

A. Exhibit No. 7 is an affidavit that William F. Carr, attorney for this case, did serve notice to all of the working interest owners affected.

Q. Attached to that do we have return receipts showing that the offsetting operators have in fact received notice of today's hearing?

A. Yes, they are attached.

Q. In your opinion will granting the application of MW to amend the application by increasing the production factor to 77-and-a-half percent cause waste?

A. The granting of this application will not cause waste.

Q. Why is that?

A. In the interest of the timely production of reserves and in the protection of correlative rights, I believe that this well ought to be allowed to produce its fair share of this field's reserves, and that interest is best

protected by a 77-and-a-half percent acreage factor.

Q. Would any reservoir damage occur by producing it at the higher rate?

A. Oh, no.

Q. You're not encroaching on any other operators, so correlative rights should not be impaired?

A. That's correct.

Q. Will MW also call a geological witness?

A. Yes.

Q. Were Exhibits 1 through 7 either prepared by you or compiled under your direction and supervision?

A. Yes, they were.

MR. CARR: At this time, Mr. Catanach, I would move the admission of Exhibits 1 through 7.

EXAMINER CATANACH: Exhibits 1 through 7 will be admitted as evidence.

MR. CARR: That concludes my direction examination of Ms. Leonard.

EXAMINER CATANACH: Mr. Bruce.

EXAMINATION

BY MR. BRUCE:

Q. Ms. Leonard, you talked about the penalty, but I believe under the current order, whatever that number may be, 9487-A, there's a 48 or 49 percent allowable factor; is that correct?

A. Yes, sir.

Q. Not a penalty factor?

A. That's correct.

Q. That's the allowable. And you're seeking now a 77.5 percent allowable factor?

A. Yes.

Q. And that's -- you can calculate it if you want, but that will roughly allow MW to increase production by about 60 percent?

A. That's correct.

Q. The Smith No. 1 well in Section 12, how much has that produced to date?

A. That well has produced approximately 30 Bcf.

Q. Three-zero?

A. Yes, sir.

Q. Now, I believe in your calculations on productive acreage in Section 12, you used 500 acres; is that correct?

A. That's correct.

Q. Wouldn't a large amount of that have

already been drained by this Smith No. 1 well?

A. Well, yes, sir, it has, but there's been a significant pressure depletion as a result of this from the Federal No. 1 producing.

Q. Do you have any idea how much has been drained by the Smith No. 1 as far as acreage?

A. No, sir, I don't.

Q. What was the last pressure reported on the Smith No. 1?

A. I don't have that information. The field pressure is approximately 1600 pounds.

Q. What is the pressure in your Smith No. 2?

A. Approximately 1550 pounds.

Q. And the Smith No. 1, is it shut in now?

A. It's plugged and abandoned.

Q. And you don't have a final pressure on that?

A. No, I don't.

Q. Now, regarding water production, are there wells to the east in the Indian Basin-Upper Penn pool that have watered out?

A. Yes, there are.

Q. Is the trend generally from the east to the west water encroachment?

A. In my opinion the trend is generally from the northeast.

Q. Okay. So it's coming from the northeast to the southwest?

A. Yes.

Q. So if there's going to be watering out, the Musselman well would probably water out before your Apache well -- I mean your Smith No. 2 well?

A. For several reasons. We are structurally significantly high to the Musselman well. And the other reason is that that well is indeed northeast of our well or more north.

Q. It's further north, but since the water is encroaching from the northeast, the water would reach there first?

A. Yes.

Q. Even if they were at the same level structurally?

A. Yes.

Q. Regarding the Smith No. 1 well, was there evidence of a tubing or packer leak in that well after watering out?

A. It was never tested.

Q. Okay. But you did state you thought

there was a casing leak above the packer?

A. I don't know where that casing leak was. I simply believe that there is a casing leak.

Q. That's speculation because you haven't tested it?

A. No, it hasn't been tested. Amoco was the operator of the well at the time.

Q. What was the method of testing the pressure in the Smith No. 2 well?

A. Shutting tubing pressures.

Q. In the Smith No. 1 well, did you have any water sample from that well?

A. No, sir.

Q. So the resistivity wasn't checked?

A. No, sir.

Q. Does Amoco -- excuse me, MW or Apache have any partners in the Smith No. 2 well?

A. Yes, we do. Oryx is a 50 percent working interest owner in the Smith No. 2.

Q. Approximately how thick -- and you may want to defer this to the geologist -- but how thick is the Upper Penn formation?

A. I'll let John answer that since he's the one that developed all that.

Q. You mentioned Oryx is a partner in the well. Obviously they have approved of the request to increase the allowable?

A. Yes, sir, they have.

Q. Is that in any way prompted by their own internal economics or --

A. I don't know.

MR. STOVALL: Mr. Bruce, can you wait just a moment.

(A recess was taken.)

MR. BRUCE: Just a minute, Mr. Examiner. I believe I'm almost done here. One final question.

Q. I believe you said Exhibit 6 was -- at least some of the calculations were derived using new information -- that was calculated using new information derived from your No. 2 well; is that correct?

A. That's correct.

Q. What was new from the No. 2 well as opposed to what Amoco told you about the No. 1 well?

A. Amoco had informed us that the Smith Federal No. 1 had watered out as a result of water encroachment. Testing of the No. 2 well

indicated that we had approximately 100 feet of additional gas column that was not expected in that well.

As a result of that additional 100 foot of gas column, we have extended the amount of productive acreage of down-dip of what was originally believed to have been the gas-water contact.

MR. BRUCE: Okay. I have nothing further at this time, Mr. Examiner.

EXAMINER CATANACH: Mr. Kellahin.

MR. KELLAHIN: Thank you, Mr. Examiner.

EXAMINATION

BY MR. KELLAHIN:

Q. Ms. Leonard, I'm going to try to understand the sequence of events between what I will call the Amoco order, which was the second amended order that you obtained from the Division. There were three parameters or factors in the penalty calculation, were there not?

A. When Amoco originally secured the order in May of 1991, before MW had purchased the property, there were those three factors included in that calculation, that's correct.

Q. When you came back in August of 91 --
A. Yes, sir.
Q. -- those same three factors were applied to the penalty calculation?
A. Yes, sir.
Q. But there was an adjustment made -- was there any adjustment made?
A. No, sir, there was no adjustment made.
Q. Okay. The three factors were what we've characterized a productive acreage component, the double-circle component and then a distance-to-boundary component; right?
A. That's correct.
Q. Okay. When Amoco presented and you presented, I guess, back in the August hearing in 91 the productive acreage factor, was that based upon a structure map?
A. Amoco's productive acreage factor was not based upon a structure map. I didn't really present anything. I simply recommended that we continue with the same acreage factor that Amoco had requested in their April hearing.
Q. What was the acreage factor Amoco had requested or used in the earlier hearings?
A. The productive acres were 352 acres.

Q. Okay. How was that derived; do you know?

A. Amoco drew a line from the original well in Section 1, which was the Arco Smith No. 1 well. That line then extended to the Smith Federal Gas Com. No. 1 well to the south, and then over to a dry hole to the southeast of the Smith Federal Gas Com. No. 1, which would be the Pan American Dunkin Federal No. 1. And they simply stated that all acreage west of that line was productive acreage.

Q. There wasn't a structural factor integrated into the analysis of the productive acreage?

A. No, sir, there was not.

Q. So when you and your geologists then prepared the structure map, it is the structure map that you're now using to make the adjustment in the productive acreage?

A. Yes, sir.

Q. And productive acreage is simply that portion of the structure above the minus 3600?

A. That's correct.

Q. Contour elevation on the structure?

A. Yes, sir.

Q. And everything below that then is presumed not to contribute for purposes of the calculation?

A. For purposes of the calculation, we're really considering the minus 3600 as the lowest known gas. I firmly believe that there is productive acreage below a minus 3600. I simply can't prove it. So we're using the minus 3600 as our boundary for the calculation of the penalty.

Q. Explain to me again the data between the No. 1 and the No. 2 well in Section 12 that causes you to believe that the lowest known gas is now approximately 100 feet below what Amoco was using for the lowest known gas.

That was based upon re-analyzing the No. 1 well and attributing the water produced in the No. 1 to a casing leak?

A. Yes, sir.

Q. Was there any water analysis made of the water produced from the No. 1 well?

A. We found no water analyses in the file.

Q. Do you have any way to calculate or estimate the approximate location of the casing leak?

A. No, sir, we don't.

Q. Where would you attribute the water production to in that well if it's not coming from the formation within the pool?

A. That water production could be coming from an interval that's deeper than a minus 3600 feet. The well was drilled through the entire Penn section. It could be coming from a shallower interval.

I personally suspect it's coming somewhere deep within the upper Penn, but I really -- that's a suspicion only and has no proof or facts behind it.

Q. Have you reviewed the drilling and completion reports and information for the No. 1 well?

A. I have reviewed all of the current -- or I'd say recent reports, any workovers that have been done within the last three years.

Q. Do you find any information that shows that the well is completed in such a fashion that water could be migrating in that wellbore from a deeper water contact up into the wellbore?

A. There is no suggestion that that could happen.

Q. Give me your best hypothesis of where

the water is coming from.

A. I think the water is coming from somewhere deep in the Penn section.

Q. Okay. Using the geologist's structure map and then determining the number of surface acreage in the section above the minus 3600 foot, you get the approximately 500 acres, was it?

A. Yes, sir.

Q. So then 500 acres in a ratio to the 640 was then the productive acreage portion of the penalty calculation?

A. That's correct.

Q. When you put that in place with the other two factors, what number do you get for the production allowable number?

A. Following the same formula that Amoco used in the original application, we get 0.61 allowable, acreage allowable factor.

Q. Okay. You've suggested or requested a 77.5 percent allowable factor. What did you adjust to get the increase?

A. To get the 77-and-a-half percent allowable factor?

Q. Above the 61 percent.

A. I didn't adjust anything. I took the

average of the productive acres and the two-circle method and used that average, and that was 77-and-a-half.

Q. Okay. If you take the productive acreage number --

A. Yes, sir.

Q. -- and average that with the distance-to-boundary ratio and delete the double-circle portion, do you know what you get?

A. No, sir, I don't.

Q. If the well you're seeking an increase in its allowable on was not restricted in any fashion, had a full allowable, what would be its daily gas production rate; do you know?

A. The average allowable for 1990, I believe, was 4.4 million a day. I really don't know what the average allowable has been for 1991.

Q. Does the No. 2 well in Section 12 have the capacity to produce a full allowable if it was not otherwise limited by the penalty factor?

A. I don't think a full allowable, no. We tested the well for a couple of days, and it produced 2.9 million a day at 780 pounds. I don't really know what the well would do with

additional drawdown.

The well hadn't completely cleaned up at that time, but I suspect that the limits of its production is somewhere around three-and-a-half million a day.

Q. If the allowable for the spacing unit is applied at the 61 percent, what would be the producing rate of your well on a daily basis?

A. If I assumed -- let's just have a nice round number -- four million a day, that would be approximately two-and-a-half million a day.

Q. Okay. And if we move it up to the 77-and-a-half, would your well be restricted at all?

A. Yes, it would be somewhat because the allowable would be then something around three million a day.

MR. KELLAHIN: Thank you, Mr. Examiner.

EXAMINATION

BY EXAMINER CATANACH:

Q. Ms. Leonard, when Amoco originally came in to permit this deviated well, do you know why Amoco proposed a penalty?

A. No.

Q. Was the application objected to as far as you know?

A. I believe that Musselman, Owen & King objected to the application, but I don't know if they objected to it because of the penalty or not. I don't know where that entered into it. I really don't understand that sequence of events.

MR. BRUCE: We might be able to clear that up, and I'll have a witness discuss that briefly.

MR. STOVALL: Do you want to wait until his witness?

MR. BRUCE: Basically it was agreed upon.

EXAMINER CATANACH: Prior to the hearing?

MR. BRUCE: Yes.

EXAMINER CATANACH: I would ask Mr. Kellahin how Marathon feels they're being affected by this whole thing.

MR. KELLAHIN: We're not taking a position in their case. We are interested insofar as how this penalty is applied to our case, which is the following case, and the relationship between Sections 13 and 14.

EXAMINER CATANACH: I see.

MR. STOVALL: Trying to build a record, are you, Mr. Kellahin?

MR. KELLAHIN: Doing what I can.

MR. CARR: Reminds me, you always enter your orders before you get the records, so my efforts are to no avail.

MR. STOVALL: We'll keep your caustic comments on the record.

MR. CARR: I didn't say that.

MR. KELLAHIN: I'm just repeating what my able counsel has suggested.

(Discussion off the record.)

Q. (BY MR. CATANACH) Ms. Leonard, on your allowable calculation, why would you throw out the distance-ratio method in your calculation?

A. In my opinion there are probably more than 500 productive acres in this section that are productive. And I think it would be unfair to penalize the well unnecessarily and not give it a chance to produce the gas reserves that remain in that 640-acre spacing unit.

Q. Do you have any idea what those reserves might be?

A. Not really.

Q. It's my understanding that MW or Apache currently owns all of Section 11 and Section 12; is that correct?

A. No, sir. We have half of Section 12, but we do own all of Section 11.

Q. Half of Section 12. And who owns the other half?

A. Oryx.

Q. So they're a 50 percent partner in the well?

A. Yes, sir.

Q. Now, in trying to understand how you determine the minus 3600 feet as being the lowest known gas, that was determined how again?

A. That was determined using the information, the perforation information in both the north and south offsets, which are both perforated to below a minus 3600, neither well producing significant volumes of water. And based on the test in the No. 2 well, it was tested down to minus 3588 and did not produce any liquids at all.

Q. So is it your opinion in the Smith well No. 1 in Section 12 that was plugged that the interval for minus 3508 to minus 3600, that's all

productive?

A. That's all productive.

Q. And it was never tested in that well?

A. No, sir. I found a procedure in the well requesting that the casing be tested, but when we reviewed the actual records of how the well was tested, the casing was never tested.

This was at a time when Amoco was disposing of the property. I don't think that they were maybe paying as much attention to it as they might otherwise.

Q. Also in your opinion you don't believe that the interval from minus 3482 to minus 3508 within Section 12 was drained completely by the first well?

A. No, sir. The section still has pressure. We still have approximately 1600 pounds of reservoir pressure.

EXAMINER CATANACH: I believe that's all I have for that.

MR. STOVALL: I've got a couple questions, if I might.

EXAMINATION

BY MR. STOVALL:

Q. Let me make sure I understand the

sequence. Amoco operated the No. 1 well, got water in it, and basically said we need to go up-structure, let's kick off and go over to a higher structural position from the same wellbore; is that correct?

A. That's correct.

Q. Got that approved. Determined they couldn't do it because the well wasn't in good enough mechanical condition to do it?

A. Yes, sir.

Q. Sold the property to MW or Apache -- or sold MW to Apache, I guess, is what you said they did; right?

A. That was fairly close. We bought the property effective July 1 of 1991. We took over operations effective August 1 of 91. The attempt to re-enter the well was made in July of 91 while Amoco still had operations of the well, but Apache was the owner at that time.

Q. Then Apache drilled the No. 2 subsequent to taking over operations in August, I guess; is that correct?

A. Yes, sir.

Q. And drilled the No. 2 based primarily on the geology and engineering presented by

Amoco; is that correct?

A. We authorized the No. 2 internally based on Amoco's geology and engineering. At the time that that well was being drilled, John Polasek, who you will meet in a minute, was hired. And I asked him to do an in-house geologic interpretation since we didn't have one. So he started his in-house interpretation at the time that well was drilling.

Q. And subsequently, based upon his work and your later analysis, you determined that water really wasn't the problem -- water formation wasn't the problem in the well?

A. That's correct.

Q. Given that knowledge, if you were getting a fresh start, if No. 2 weren't drilled today, would you tend to go further away from the section line and go back closer to the No. 1? Hypothetical question. It really doesn't mean a whole lot.

A. My opinion is I would recommend it to management because then we wouldn't have to mess around with this penalty stuff.

Q. In other words, that structural gain that you make by moving this far east isn't as

significant as Amoco thought at the time they --

A. That's correct.

Q. -- sought the application; is that correct?

A. That's correct.

Q. With respect to the casing leak, although it wasn't tested, you did indicate that somebody -- production engineer and production superintendent -- actually looked at the casing that was pulled?

A. We had --

Q. You had some physical evidence that there was some bad casing in the hole; is that correct?

A. Yes, we do. We had two members of our staff look at it. And we were looking for locations for the Smith Federal No. 2, and we were out on location. And there was casing. It was lying down, and they looked at it and were horrified at the condition of that casing.

Q. You don't know what particular depth the casing they were looking at came from? There's no indication of that; is that correct?

A. No.

Q. Mr. Bruce asked you about the water

encroachment. You say it's coming from, really from up-dip, from the northeast; is that correct, or kind of along a strike, I guess?

A. It's not necessarily conforming to structure. In my opinion, based on the way we've got it mapped, the volume of water, the source of water is largely from the northeast, and it conforms to structure somewhat but not in the classical sense.

Q. Assuming that is the case and you testified that the Musselman well would probably water out first because it is both lower and to the north of the No. 2 Smith well, does the location of the No. 2 Smith well have any bearing on when the Musselman well will water out?

A. In my opinion, it doesn't. There are approximately 34 wells currently producing from this field. And all of those wells have bearing on when the Musselman will water out.

Q. Bearing in the sense that they are withdrawing gas and leaving room for the water; is that what you mean?

A. That's correct.

Q. But whether the Apache well is at -- what is it? 480 feet or 1620 feet, it's the

withdrawal of gas and not the location of the well?

A. That's correct.

Q. One other thing. You've stated that -- and correct me if I'm putting words in your mouth -- that the distance-ratio penalty factor isn't necessarily appropriate in this case because the distance -- you are encroaching only on your own property and not somebody else's; is that correct?

A. That's correct.

Q. But if either of the parcels were to be sold and it were to become different ownership, then that might be a significant factor; is that correct?

A. It certainly could.

Q. The other question is based upon this unorthodox location, assuming there is some -- call it excess drainage for lack of a better term -- from Section 11, does that in effect mean that Apache has given some of its gas to Oryx, if you will, because they're a partner in the well that's doing that, some of its Section 11 gas?

It's giving its own gas to its partner in its own well; is that correct? Tricky

question.

A. I don't think so. I think that it will be all that the Smith Federal No. 2 can do to adequately drain the reserves that are under its own section. I don't think it has any competitive advantage over the structurally higher and much thicker Smith Federal No. 1 in Section 11.

MR. STOVALL: Good answer. Okay. That was kind of a throw-away question anyway.

I don't have any other questions.

EXAMINER CATANACH: Anything further? Mr. Bruce.

MR. BRUCE: Can I ask one, just a clarification?

FURTHER EXAMINATION

BY MR. BRUCE:

Q. On the No. 1 well, I think you said it was tested in the Upper Penn immediately before it was plugged and that water was found; is that correct?

A. It was tested at approximately minus 3610. That zone was not stimulated at all, and usually the Upper Penn has to be stimulated somewhat before it gives up any significant

volumes of fluid. And they swabbed approximately 350 barrels of water per day from that and were not able to keep up with the water volume.

That suggests to me that the water they were producing was the same water that they were producing from the upper zone. That's why I think the water is coming from the lower Penn someplace, someplace down deep from a casing leak.

Q. Was that test done by Amoco or by Apache?

A. That test was done by Amoco in 1990.

MR. BRUCE: Thanks.

EXAMINER CATANACH: The witness may be excused.

MR. CARR: At this time we call John Polasek.

JOHN POLASEK

Having been duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. CARR:

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

A. John Polasek.

Q. Would you spell "Polasek."
A. P-o-l-a-s-e-k.
Q. Where do you reside?
A. Houston, Texas.
Q. By whom are you employed and in what capacity?
A. I'm employed by Apache Corporation as a Senior Staff Geologist.
Q. Have you previously testified before the New Mexico Oil Conservation Division?
A. No, I haven't.
Q. Would you briefly summarize your educational background and then review your work experience for Mr. Catanach.
A. I got a bachelor's degree in geology from Syracuse University in 1974, a master's degree from the State University of New York in 1978. I started off working with Amoco in 1978, and went to a company called Wintershaw in 1982, where I worked there approximately three years.

In 1985 I became an independent geologist. And I was an independent consultant as well as owned JP Exploration. My latest consulting job was Apache Corporation, which I started in late August, I believe. And I've been

hired by Apache Corporation since then.

Q. You're now a full-time employee of Apache?

A. I'm a full-time employee.

Q. What were your degrees in?

A. Geology.

Q. Are you certified as a petroleum geologist?

A. Yes. I'm certified by the Society of Independent Professional Earth Scientists, or SIPES, Houston chapter.

Q. Are you familiar with the area which is involved in this application in the subject well?

A. Yes, I am familiar.

Q. And have you made a geological study of this area?

A. Yes, I have.

MR. CARR: We tender Mr. Polasek as an expert witness in petroleum geology.

EXAMINER CATANACH: He is so qualified.

Q. Have you prepared an exhibit for presentation in this hearing today?

A. Yes, I have.

Q. That's what has been marked as MW/Apache Exhibit No. 8?

A. Correct.

Q. Would you identify that now and review it for Mr. Catanach, and we might start with the structure map.

A. Okay. On the left-hand side of this cross-section, D-D prime, there's a structure map with the structural cross-section. The wells included in this structure cross-section are the Pan Am-Smith 1 in Section 11, the Apache-Smith No. 2 well, the Smith No. 1, and to an old Pan Am dry hole in the southeast part of the field.

The structure map is on top of the Pennsylvanian. And that is a major unconformity in the area. Do you have a colored copy of that?

MR. STOVALL: I just discovered we do have a colored copy.

A. Okay. The structure map is on top of the Penn, the Cisco Canyon is the formation name, as they call it. Upper Penn. I guess the Conservation calls it the Upper Penn.

This information was put together by all the existing wells that have been drilled in this portion of the field. Some of the interpretation on the cross-section was based on

log, log's character, cores, and any sample analyses that were done.

I want to show on that structure map the yellow outlines. In Section 11 is 100 percent MW/Apache. In Section 12 in the Smith Federal, it's 50 percent Apache, MW/Apache, 50 percent Oryx. And Section 13 it's approximately 93 percent Apache, 7 percent Oryx.

Q. If we look at the structure map, this is the same structural map that was presented as Exhibit No. 2; is that correct?

A. Exactly.

Q. And you prepared this?

A. I prepared this.

Q. Did you prepare it for this hearing, or basically what were you asked to do?

A. No. When I first started consulting for Apache, they had this area. They had acquired interest in 26 wells in this particular area. The maps that Amoco had were maps that had been done previously and hadn't been updated in a few years. And I started a project in here to evaluate their properties and including the Smith Federal lease.

Q. Did you integrate the Amoco information

into your work?

A. Yes, I did.

Q. And your interpretation is based on that and, what, seismic information?

A. No. It was just based on adding additional wells that hadn't been included in the Amoco map in a little bit more subsurface detail. Their map was on 100-foot contour interval, and mine is on 50.

Q. When you compare your work to that of Amoco, is your evaluation of Section 12 -- has it differed in any material way?

A. Yeah. My map is a little bit more conservative.

Q. Let's go now to the cross-section portion of this exhibit, and I'd ask you to review that for Mr. Catanach.

A. Well, the first thing that's obvious from this structure cross-section -- and let me again -- the three wells, starting from the left to right, are Pan Am, old Pan Am, MW/Apache wells. That goes approximately east to west. And the final well is to the southeast. These are hung on a minus 3600 structure datum.

The thing that's obvious here is the

color, and let me explain the color. Typically, geological colors for dolomite is pink, for limestone it's blue. This blue is not water; it's limestone. And for shaley limes or shaley dolomites it's gray.

What I've done on this cross-section is identify the base of the dolomite, which is basically the reservoir rock of the Indian Basin field. Okay. This dolomite sits on bedded limestones, approximately Canyon age, and is overlain by Wolfcamp age, shales, and clastics in some cases. It's a major unconformity in the area, so the top of this reef has been eroded down somewhat.

I also included on here the zones that were perf'd and produced out of the reservoir in red. The perfs are in red. On the right-hand side of the cross-section was the original oil-water contact of approximately 3800 feet, minus 3800 feet. And that is just based on the dry hole in the Pan Am No. 1, Dunkin Federal to the southeast. The Dst recovered water along with gas.

Okay. As you can see, the thickness of the dolomite in the Pan Am No. 1 Smith Federal in

Section 12 is approximately 350 feet thick. As you go from that well to the Apache well, No. 2 Smith Federal, we only topped about -- the top, 160 feet roughly.

And as you go westward from there, the No. 1 Smith in Section 11 is approximately 277 feet thick. You can see in here that I have marked some shale zones. This is based on interpretation.

There is Paleo in here as far as differentiating different zones, but when you get into dolomite, the Paleo -- all the bugs are pretty well obliterated by the dolomization.

You can also see on the Smith No. 2 well the lowest zone that we perf'd and the upper zones that we perf'd and tested. And there is a bridge plug between the two zones.

Q. Basically what conclusions have you reached from your geologic study as that relates to Section 12?

A. As far as the comparison between the No. 1 Smith Federal and No. 2, we are geologically approximately 30 feet structurally higher; however, we don't have open the whole zone. We're basically structurally higher. I

don't think it has any bearing on the reservoir.

Q. And your study and your geological interpretation is the basis for the determination that there are 500 productive acres in this section?

A. Correct.

Q. The blue on the exhibit does not indicate water?

A. Does not indicate water.

Q. Was Exhibit No. 8 prepared by you?

A. Yes, it was.

MR. CARR: At this time, Mr. Catanach, we move the admission of MW Exhibit No. 8.

EXAMINER CATANACH: Exhibit No. 8 will be admitted as evidence.

MR. CARR: Thank you. That concludes my direct examination of this witness.

EXAMINER CATANACH: Mr. Bruce.

EXAMINATION

BY MR. BRUCE:

Q. What was the gray, these gray stringers on Exhibit 8 represent?

A. Again, this is hung structurally, so the gray doesn't -- when you look at it on the log, sometimes it's offset. But it basically

indicates a shaley limestone or shaley dolomite.

Q. Okay.

A. And --

Q. Go ahead.

A. And that's based on Amoco core information and cores that they have taken in this area.

Q. Okay. Looking at the Pan American No. 1, Smith Fed. well, there are two sets of perfs there, one marked in red and one marked in blue. What does the blue indicate?

A. The blue one is the perf, is the zone that was tested, that Amoco tested and produced water prior to the plugging.

Q. And that's just slightly below 3600 feet?

A. Right.

Q. Below sea level?

A. Correct.

Q. And is that equivalent to the perforations in the Musselman well to the north?

A. The Musselman well perfs -- and again, this is done by Ceci -- I believe are -- see, the difference between our well and the Musselman well, the Musselman well has about 50 or 60 feet

of limestone above the dolomite. So their main zone is approximately stratigraphically equivalent to the zone that we see in the No. 1 Smith in that particular well.

Q. The No. 1 Smith in Section 11?

A. Right.

Q. Okay. Do you know what the original formation or reservoir pressure was?

A. I believe the original reservoir pressure in this field was about 2800 pounds. Presently it's about 1600 pounds. And most of the wells were drilled in the early 60s.

Q. Okay. And you're saying 1600 pounds based upon your pressure test in the Smith Fed. No. 2 well?

A. Correct. But other wells in the area that have been redrilled recently into the reservoir have that same reservoir.

Q. Regardless of whether they're high or low in the Upper Penn?

A. It seems to be, yes.

MR. BRUCE: Nothing further, Mr. Examiner.

EXAMINER CATANACH: Mr. Kellahin.

MR. KELLAHIN: I don't have a copy of

your structure map. Let me borrow one.

EXAMINATION

BY MR. KELLAHIN:

Q. In looking at Section 12, what would be the optimum location in 12 to drill a well?

A. In 12?

Q. Uh-huh.

A. Well, I think structurally it doesn't seem to matter. I think the optimum location would be for the thickest dolomite.

Q. Do you have a gross isopach that will show the pictures?

A. Yes, I do. But I'll have it for the next -- I mean I do have it, yes. I do have a dolomite isopach.

Q. Describe for me why you reached the conclusion that structure is not the important criteria for picking the optimum location in Section 12.

A. The Hoc No. 1, the Pan Am Hoc, or now it's the MW/Apache Hoc No. 1, has been producing at approximately minus 3700 or below that or below 3650 and closer to 3700.

MR. CARR: That's the well on the north half of 13; right.

THE WITNESS: That's the well on the north half of 13. And that particular well is still making gas, although at marginal amounts with no water production.

None of the other wells along that trend in Section 13, 14, 11, other than the Pan Am well in 12, have had any water production whatsoever.

Q. (BY MR. KELLAHIN) What's the thickness of the reservoir at the Apache 2 well location of Section 12?

A. We did not go deep enough, but it's estimated about 300 feet thick, and it's thinner than the No. 1.

Q. How does that compare to the Musselman-Smith No. 2 in Section 1?

A. Musselman, I do not know. They only topped the zone. They went about 30 or 40 feet into it, and that's it.

Q. Do you have sufficient data from the wells drilled in this area to draw a net pay map, if you will, of the reservoir by which you could apportion reservoir share among the various spacing units?

A. No, I don't.

MR. KELLAHIN: No further questions.

MR. STOVALL: Just one easy geologic question.

EXAMINATION

BY MR. STOVALL:

Q. Do you agree with the engineer that were the Smith No. 2 not already drilled, that you wouldn't necessarily seek this unorthodox location based upon the information you have today?

A. It appears as though the dolomite is thicker in the No. 1 location.

Q. So you'd go further east?

A. I think Amoco had a little different interpretation. I think when they applied for this thing, their interpretation was to go structurally up-dip. And I found no net dolomite maps or anything that Amoco had done in their file. So it was almost -- I started from scratch pretty much.

MR. STOVALL: That's my question.

EXAMINER CATANACH: I have no questions. The witness may be excused.

MR. CARR: That concludes our direct presentation.

(A recess was taken.)

EXAMINER CATANACH: You may proceed, Mr. Bruce.

MR. BRUCE: Mr. Examiner, I have one witness, Mr. Statton.

BOB STATTON

Having been duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. BRUCE:

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

A. Yes. My name is Bob Statton.

Q. And what is your occupation?

A. I'm a petroleum engineer consultant in Midland, Texas, with the firm Gist & Statton, Inc.

Q. And who are you employed by in this case?

A. Employed by Musselman, Owen & King.

Q. Have you previously testified before the OCD as an engineer?

A. No, I have not.

Q. Would you, please, state your educational and work background for the

Examiner.

A. Okay. I graduated from Texas A & M in 1979 with a BS in petroleum engineering. I went to work for Allen Atwell out of Hobbs for a couple of years before joining HJ & Associates consulting firm in Dallas. I stayed there for five-and-a-half years and then moved to Midland and worked for Osborn & Yule, another consultanting firm, for about four years before my partner, Rhet Gist, and I split off here last April and started our own consulting firm.

Q. Are you familiar with the engineering matters related to this case?

A. Yes, I am.

Q. Were you hired by Musselman, Owen & King specifically to analyze this area?

A. Yes, I was.

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

EXAMINER CATANACH: He is so qualified.

Q. Mr. Statton, first of all, just briefly would you describe how the penalty in Order R-9487-A came to be?

A. My understanding from talking with Mike

Headrick of Musselman, Owen & King, is that Amoco and Musselman, Owen & King mutually agreed to that production factor.

Q. Okay. And in this case, Musselman, Owen & King isn't really concerned about Apache draining reserves off of Section 1, are they?

A. No, they're not.

Q. What is the basic concern?

A. Musselman, Owen & King are concerned about a potential coning problem that may result as a consequence of increased withdrawal rates of any wells nearby, specifically the one in the case here.

Q. So if there's too much production from the wells in the area, there might be water encroachment?

A. Correct.

Q. On Musselman's well?

A. That's right.

Q. Would you go into this coning a little bit and tell us what your fears are.

A. We had been looking, after the engineering aspect for this well for about a year-and-a-half, and we had advised Musselman, Owen & King that we wanted to take a bottom well

pressure test back in March of this year to do two things: One was to define possible skin damage. We thought from doing the pressure buildup analysis we could detect that, and if so, maybe we could do some stimulation.

But also we wanted to possibly see what the optimal rate of withdrawal would be so that we would not cause a water cone to occur. And this test was performed in March of this year, March 22, 1991. We found the reservoir pressure to be quite a bit lower than what Apache stated. We found it to be 1350 pounds as opposed to 1600.

And also from that test we ran some analytical calculations that suggested at their location, at Musselman, Owen & King's location, that going much above a million a day might cause water to come up into their wellbore region, thereby restricting adaptability.

Q. Okay.

A. I might add too that this well has started producing water. Musselman, Owen & King's well is producing water and has been since about October 29 of this year.

They conferred with us and asked us

what they should do, and we suggested cutting back to the rates that we had recommended in the first place. They have since done that, and the water production is coming down.

We're trying to reestablish a higher flowing tubing pressure so that the gas is able to lift the water that is there. We don't have any water production, but our rates are way off at this time for the well.

Q. In your opinion if there is too high of a withdrawal rate of gas from this portion of the reservoir, might water production increase in the Musselman, Owen & King well?

A. Right.

Q. Therefore might increasing the production in the Apache well adversely affect Musselman's correlative rights?

A. I believe it would. I would also like to point out at this time that when we started studying the overall field, that we noticed that back to the east where there's a lot of wells that have been plugged, many of those wells are much higher structurally than either the Musselman, Owen & King well or the Apache new well.

And we think that part of that watering out was in fact due to a severe withdrawal rate, bringing in the water, and therefore cutting short the reserves, the life of the well.

Q. So structure isn't very important in the water?

A. Structure has some importance, but rates also have a very big effect. One would -- in other words, high rate or a low rate. You're going to see different producing mechanisms around as well, of course.

Q. Do you have anything further in this matter, Mr. Statton?

A. No.

MR. BRUCE: I'd pass the witness, Mr. Examiner.

MR. CARR: Mr. Carr.

EXAMINATION

BY MR. CARR:

Q. Mr. Statton, the Musselman well in Section 1, that location was approved and a production penalty was set on that well, was it not?

A. That's correct.

Q. What is that penalty rate?

A. I don't have that available to me.
Q. Are you producing at or about the production limit as imposed by the order?
A. Actually below it.
Q. Has that always been the case?
A. Not always.
Q. In fact, isn't it true that early this year there was a dispute between Musselman and Amoco when in fact Amoco complained that you were ignoring the production limitation?
A. I can't answer that.
Q. Is it only recently that you have discovered that the well is in fact rate sensitive?
A. No. We discovered it back in March.
Q. You're not aware of any meetings with the Oil Conservation Division staff, some of the people perhaps present, when there were complaints about the rate that you were producing raised by Amoco?
A. No, I'm not.
Q. If you were producing at a higher rate at that well, that in fact would also affect the potential for coning in the well; isn't that correct?

A. That's correct.

Q. Now, if I understand your testimony, you're not really concerned about the location; you're concerned about the rate?

A. That's right.

Q. So we're not talking about drainage here?

A. The location relative to Musselman's well, we are concerned about because it is fairly close by. If you look at the map, it is one of the closest wells to the Musselman well that's producing right now.

Q. Now, your Musselman well would also be affected by the well in Section 2, would it not?

A. I haven't looked at the map. Could you point that out for me, please.

Q. There's a Conoco State No. 1 well in Section 2.

A. Yes, sir. It would also be affected by that.

Q. Wouldn't it also be affected by the Pan American-Smith No. 1 Federal in Section 11?

A. Yes, sir.

Q. Have you considered any action to perhaps adopt special rules for the pool to

restrict production because of this problem?

A. No, we have not.

Q. But you believe that the penalty should be imposed just on the Apache well?

A. I believe that Apache should abide by what they agreed to, yes, sir.

Q. Were you involved in the actual negotiation of that agreement?

A. No, sir, I was not.

Q. Do you know whether it was based on drainage or reservoir pressure?

A. I'm not aware of that.

Q. Are you aware if it was based on proximity of the common lease line?

A. No, sir.

Q. Do you know that the Musselman well was closer to the common boundary between these properties than the Apache well?

A. Yes, sir.

Q. Do you know that the Musselman well is closer to the western boundary than the Apache well is to the western boundary of its section?

A. Yes, sir.

Q. And do you know that your well is encroaching on a tract operated by another

operator, Oryx?

A. Which one would that be, sir?

Q. To the west in Section 2.

A. When you say "encroaching," what do you mean?

Q. Are you closer to Section 2 than authorized by spacing rules, or do you know?

A. I don't know that.

Q. Do you know what the spacing rules are in this pool?

A. I do not -- well, I know what the spacing is, but this is an unorthodox location just as the Apache location.

Q. Do you know the basis for setting penalties for wells in unorthodox locations?

A. No, sir.

Q. Do you know the difference between that and, say, imposing a pool rule to protect against dissipation of reservoir energy?

A. No, sir.

MR. CARR: That's all I have.

EXAMINER CATANACH: Mr. Kellahin.

MR. KELLAHIN: Just a few questions, Mr. Statton.

EXAMINATION

BY MR. KELLAHIN:

Q. You've indicated that you've made a study of the rate sensitivities?

A. Yes, sir.

Q. Of which wells?

A. Of the Musselman, Owen & King well.

Q. That's the well in Section 1?

A. That's in Section 1, yes, sir.

Q. Have you made a rate sensitivity study of any of the other wells in the pool?

A. No, sir, because we don't have access to that data. I wish we did. We would like to have that data from the old Amoco well, but that's something that's prohibited us from going into that kind of study.

Q. Do you have estimates of the gas reserves in place underneath Section 1 that are being produced by your well?

A. I have an estimate, yes, sir.

Q. Do you have those estimates for any of the other spacing units?

A. Yes, I do.

Q. Have you attempted to determine the apportionate share of those reserves among all the sections?

A. Yes, sir, I have, at least I have a map here that we could enter as an exhibit that we've worked up that involves much -- many more sections than this one does, and we've done our analysis based on that.

Q. What was the purpose of the analysis?

A. To figure out approximate ultimate recoveries per 640 in this area so that we could then try to define what might be recovered from the Musselman, Owen & King well.

Q. Have you been able to take that information and construct a penalty, if you will, for those wells that are at unorthodox locations in order to balance the equities and protect the correlative rights of the interest owners involved?

A. No, sir, because we weren't asked to do that.

Q. Okay. The Musselman well is at an unorthodox location. You're 330 off that western boundary?

A. Correct.

Q. Your producing allowable for that well is what percentage; do you remember?

A. I don't remember.

Q. Okay.

A. But we're below that percentage because of the reservoir problems that we see, and we're trying to restore relative permeability to gas that's been adversely affected by the encroachment of water.

So we've cut back on our rates hoping that the water would subside back down and thereby reduce, you know, effective permeability of the water and increase the effective permeability of the gas.

Q. Of the options to control the rates of withdrawal between your well and the Apache well, one of the choices would be a pool rule change by which the rates were controlled so that they would both be withdrawing at the optimum rate?

A. Yes, sir.

Q. Another alternative is to look at the existing penalties in place on both of those wells and see if by happenstance or otherwise those penalties, as they are now, are close enough that they will balance the withdrawal rates so that you don't have a problem?

A. Correct.

Q. Have you done the second part?

A. No, sir, we have not. We have not been asked to do that.

Q. Explain to me again your position in opposing the applicant's application.

A. It's really more than just a technical position. One is it was an agreement that came before this court, I would say. Two, from my side and the reason I am here is because we believe that these wells and, again, from our study of the whole area are sensitive to withdrawal rates that some of these other wells that have watered out at much higher structural positions than either of these two wells could have in fact produced more gas had there been restrictions applied to those wells earlier in their life.

So if we go in here and get real aggressive with either the Musselman well or the Apache well, the same kind of problem, we believe, would persist.

Q. Have you been able to or have you quantified the impact it will have if the Apache well is increased from the 49 percent up to their requested 77 percent of allowable?

A. We would have to see a pressure

transient test performed on that well to even get an idea of what that would do to ours. Ideally, we would like to see an interference test run where one well is shut in and the other well would then be produced and analyze the shut-in well to see how much interference there truly is at these different rates. I think that's one way of trying to prove our point.

Q. I understand your position. I'm trying to understand how it applies to the formula that's actually in place on the well now, the 48 percent.

A. I am not aware of how the 48 percent was derived.

Q. So you don't have any knowledge about whether or not that is an appropriate rate at which to produce the Apache well in order not to exceed the rate in which the reservoir is sensitive to that production?

A. I do not think you can say what penalty rate is based on some acreage position. It's got to be more due to pressure and pressure analysis where you could really establish this stuff. Otherwise, it's an arbitrary pick on where your gas-water contact is.

I could make a case that that gas-water contact in fact is west of the old Amoco well just as much as I could make a case for what Apache is saying. So there's a lot more arbitrary assumptions in that part than there would be if we started doing some more definitive testing.

Q. How do you make the case that the water contact is west of the Apache well?

A. Very simple, it watered out.

MR. KELLAHIN: Thank you, Mr. Examiner.

EXAMINATION

BY EXAMINER CATANACH:

Q. Do you know how long the Musselman well has been producing?

A. I can find out. I believe we're producing for a little over two years. Since May approximately 3 Bcf and until the last two months was making around 2 million a day or 1.8. They've cut the well back again because of this water problem.

Q. What's the current rate?

A. Current rate right now, like yesterday's rate was right around 2- to 300 Mcf

with no water; whereas, the previous month the rates have been coming down along with the water. We had suggested that they put a back pressure regulator on their separator to try to keep the flowing tubing pressures up so we don't load up with water and kill the well. And that's what was done.

Q. By controlling the rate in the Smith No. 2 well or by keeping it down somewhat, it might delay watering out your well?

A. Correct, and their well too, in our opinion.

Q. It's eventually going to happen, though, maybe due to production from wells in Section 2 and Section 11?

A. Could happen, yes, sir. Eventually it will. It's a matter of how much you can get out. And if it's coning, then you're going to be basically wasting a wedge of production out there which you might have had had you not coned the water to begin with.

Q. Do you believe it's fair to curtail only this one operator when there's other operators involved in this whole scenario?

A. Yes, sir, I do because, again, it was

agreed upon. And we think because of the location of this well to the Musselman well, which it is one of the closest wells if not the closest producer, that it will have the most effect.

Q. Do you think the additional data that Apache has come up with doesn't justify the increase in allowable?

A. We haven't seen the data we would like to see, one of which would be a resistivity of the water produced from that Amoco well. Another would have been the bottom-hole pressure associated with that well. If it was a casing leak upstairs, the pressure would have been a lot higher.

We would have liked to have seen that; we just don't have that information handy. I don't think it's their fault; it's just it wasn't available.

Q. You can't say that that increase from 49 percent to 77 percent definitely will have an impact?

A. I cannot say that until we have had a chance to look at another pressure test on their well. That would be as critical as anything

else. But from what we saw on our well, we did see a difference, so I'm just going by analogy.

Q. But the Musselman well produced 2 billion a day for approximately two years?

A. Actually, higher than that. It was producing over three-and-a-half for quite some time. And then they had some kind of disagreement with, I believe, Amoco and/or the pipeline about what they ought to be producing. So they've cut theirs back to an agreed allowable that is now lower than what it used to be.

Q. Is the cutback in production due to the fact that maybe your well or the Musselman well was overproduced?

A. Yes, sir. It was at one time. The well was overproduced. And I think there's a two-year period that started sometime back in this year at which they've decided to cut it back to perform up to what Amoco had wanted in the first place, which was to get back in line with production.

Q. So you're not entirely curtailing your well just because of -- just because you think it's rate sensitive?

A. At this point we are, yes, sir. We

were at a rate much higher a week ago than we are right now, or two weeks ago for that matter. We're doing it right now for reservoirs. Before it was done because of, I guess, the agreement that was made with the OCD to cut it back. But we're doing it right now to try to keep the well from loading up and dying.

The reservoir pressure is lower than what was stated earlier. And, of course, from a hydraulic standpoint that means it's going to be harder to lift these lower bottom-hole pressures, and that's what we're very concerned about.

Q. So as far as you know, the well is not being curtailed at this point due to the OCD requiring it?

A. No, sir, it's not.

MR. STOVALL: Do I get to venture into engineering now?

EXAMINER CATANACH: Have at it.

EXAMINATION

BY MR. STOVALL:

Q. I think you've answered it before, but once again, the rate sensitivity issue is, A, it's dependent upon withdrawals from the entire field; is that correct?

A. Yes, sir.

Q. And, B, it's based upon an absolute withdrawal rate of gas from the reservoir; is that correct?

A. Yes, sir. And it's also a function of the local region around those wellbores as to what the permeabilities are. They do vary across the region.

Q. Let's assume that either Apache drilled the well at an orthodox location or that they were still able to repair and continue to operate the Pan American No. 1 and then produce at a top allowable, wouldn't that have the same effect?

A. Yes, sir, if it could have, but I think that's a hypothetical question.

Q. Well, assuming you've got the same withdrawal rate from a location that's 1200 feet further east --

A. Are you also assuming the water isn't there too? That's my question.

Q. I'm sorry. Yes, I am assuming that --

A. Yes, sir.

Q. -- their conclusion about the water is correct, that the Pan American watered out due to mechanical failure rather than reservoir --

A. Yes, sir, I would have to agree with what you said.

Q. Okay. Do you understand that the penalty is a portion of allowable?

A. Yes, sir.

Q. And that if you could assign a 10 percent penalty, but if the allowable is high enough, you could still get a rate that is above some limit that you would set as an engineer as a maximum efficient rate for the reservoir?

A. I'm not sure I followed that.

Q. In other words, 10 percent of 20 million could be higher than 68 percent of 2 million?

A. Yes, sir, I understand that, what you're saying.

Q. And so it sounds to me like you're coming in here using the wrong forum to try to do what you want to. As an engineer what you would like to do is see the withdrawal rates from reservoir limited based upon science to a number which would be determined by scientists as being the absolute number above which you start doing damage to the reservoir through coning; is that correct?

A. No, sir. The reason I am here is because more -- I guess you would say a defensive posture. Not knowing what they were going to bring, leaving Apache to this forum, what information they had, one, there was an agreement of .49. And two, from what they have stated and what we have seen in these wellbores, at least the Musselman, Owen & King, in fact these wells to the east have watered out at a higher position than even our well or their well, tells me it is somewhat sensitive to the withdrawal rate.

I'm not proposing that we change rules. I'm saying how it affects the Musselman, Owen & King well, and I also propose it will do the same thing to the Apache well.

Q. To the extent there's agreement, do you realize, if it's any sort of enforceable agreement, that the district court is going to have to enforce it, not the OCD; that as far as we're concerned, both the Musselman well and the Apache well are limited by order?

A. Yes, sir.

Q. And that agreement may have been -- whatever agreement there may have been is part of the evidence that went into the entering of that

order?

A. Yes, sir, I understand.

Q. And you understand that Apache now is saying that there is different information than was available at the time the order was entered and therefore they're asking that the order be changed based upon new and different information; is that correct?

A. I understand that they are submitting different information. I would just say it's incomplete, but I understand what you're saying.

Q. But you haven't submitted anything else other than the fact that the thing is --

A. I can submit any and all exhibits required by Apache.

Q. Of course, you know, that is your option, but I want to make sure that we're talking in the right framework is where I'm coming from. I'm just concerned, and I think everybody else has raised the same concern, that you may be asking for the right thing for the wrong reasons in this case.

A. Okay.

MR. STOVALL: I have no further questions.

EXAMINER CATANACH: I have one additional question.

FURTHER EXAMINATION

BY EXAMINER CATANACH:

Q. Do you agree with Apache's contention that there was a portion of the reservoir that was not drained by the Smith No. 1 below where they were originally perforated?

A. I disagree with that because, again, I believe that this well watered out due to water encroachment from -- the water was indigenous to that zone and was not a casing link. So I would disagree with that.

Q. So you would disagree with the 500 acres productivity rates?

A. That's correct. I think the only way to prove that obviously is to have done a replacement well to the well they just plugged. And had that well been wet, I think the proof would have been in the pudding or vice versa. But I think right now it's presumptuous to say it's 500 acres or even 200 acres.

FURTHER EXAMINATION

BY MR. STOVALL:

Q. Let me follow up with you and ask you

then, they have presented some evidence in support of their contention that the water was due to casing link. Do you have any evidence to the contrary? What evidence do you have to support your argument?

A. I don't have any evidence, but with all due respect, I don't think they do either. All they have is evidence of casing. We don't know where it was pulled from. I would say it wasn't pulled from the bottom. We don't know if that casing in fact had communication behind the pipe to this particular zone.

We asked them for water resistivities to back up their claim that the water was in fact indigenous or a bottom-hole pressure test, either one of which would have said yes, say this was or was not a casing link. I say we don't have evidence, but they don't either.

MR. STOVALL: I don't have any further questions.

EXAMINER CATANACH: Anything further?

MR. CARR: I do.

FURTHER EXAMINATION

BY MR. CARR:

Q. Mr. Statton, do you happen to know when

the Smith No. 1 well in 12 was drilled approximately?

A. I would have to look at my notes, but I do not know, sir.

Q. Do you know when the Musselman well in No. 1 was drilled?

A. It was drilled, I believe, in 1988, but I would have to go back and look.

Q. That date is just approximate, I understand.

A. Right.

Q. That well, the Musselman well, was drilled sometime after the well in 12, was it not?

A. The well in 12? Yes, sir, this one here.

Q. And it had produced for some period of time before Musselman's well was actually drilled?

A. Correct.

Q. When did Musselman acquire its interest in Section 1?

A. I am not sure of that.

Q. There would have been an opportunity for either Musselman or its predecessor to drill

a well prior to that time if they were concerned about the Smith No. 1; isn't that right too?

A. Yes, sir.

Q. To protect their correlative rights and avail themselves of the opportunity to do that?

A. Would you repeat that.

Q. They could have drilled the well at an earlier date if they felt there was something there to produce or protect?

A. I would assume that's correct, yes, sir.

Q. You've talked about the agreement. Here, again, I just want to make sure I understand you do know there was an agreement, but you don't know what the factors were that went into those negotiations?

A. No, sir. I was not privy to that.

MR. CARR: That's all.

EXAMINER CATANACH: Mr. Bruce.

FURTHER EXAMINATION

BY MR. BRUCE:

Q. Mr. Statton, just a couple of questions. In response to Mr. Stovall, you said there was a field-wide rate sensitivity regarding production; right?

A. We believe there is.

Q. But what's more important, field-wide or the immediate wells?

A. I would say the immediate wellbores, proximity to the Musselman well.

MR. BRUCE: Thank you.

EXAMINER CATANACH: Anything further of this witness? If not, this witness may be excused.

MR. BRUCE: Mr. Examiner, if I could, Mr. Carr has raised some questions, and there is one person who could probably answer some of those questions here regarding the agreement with Amoco, the allowable, et cetera. If I could, he wouldn't be testifying as an expert, but just his knowledge of the day-to-day operations of the well. And if I could have him sworn in to testify --

EXAMINER CATANACH: That would be fine.

MR. STOVALL: He's not been previously sworn?

MICHAEL HEADRICK

Having been duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. BRUCE:

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

A. My name is Michael Headrick.

Q. Where do you reside?

A. Midland, Texas.

Q. Could you state for the Examiner what your interest is in the well and your association with Musselman, Owen & King?

A. I'm an independent businessman in Midland. I developed this prospect before it was drilled and sold the prospect to Musselman, Owen & King. I acquired the acreage from Hondo, the successor to Arco that owned the acreage after the original well in Section 1 watered out.

We -- Musselman, Owen & King then drilled the well. And I share office space with Musselman, Owen & King and am intimately involved in the day-to-day operations of the well.

Q. When did Musselman, Owen & King acquire its interest in this well?

A. I acquired a farmout from Hondo on the acreage in the fall of 1987. I assigned that interest to Musselman, Owen & King following their drilling of that well. The well was

completed in February of 88, went on production in May of 88.

Q. Now, Mr. Carr raised some questions. First of all, would you describe what is the, strictly speaking, the allowable or the allowable factor for Musselman Owen & King's well?

A. It was originally established through the fairly well established procedure for the area at least of coming up with an average of the three different factors, the acreage and the distance to the lines and the concentric circles, et cetera, et cetera.

Q. The factors discussed by Ms. Leonard?

A. Yes.

Q. What is the allowable for the Musselman well?

A. I can't remember offhand what the exact percentage was, but it's in the low 50s. Section 1 is larger than 640 sections, so the acreage factor was 1.06 or something like that times the original penalty, arriving at around 57 percent allowable factor.

Q. Okay. Now, it's been discussed about overproduction on the well. Could you discuss that, how it occurred, and what resulted.

A. Yes. This is the only well that Musselman, Owen & King operates in New Mexico. They were unfamiliar with the prorated type fields. And the original factor of .57, as it was incorporated into the proration books until last spring, was incorrect.

And the allowable that was -- they were either not given an allowable in the proration book formally, or they were later assigned a production volume that was incorrect. Musselman, Owen & King essentially followed along with whatever guidance they were given in the proration schedule.

Before the schedule was -- I say corrected in a liberal sense -- we -- or Musselman, Owen & King requested that the Commission correct the book, and it was not corrected until, I'm going to guess it was around a year-and-a-half ago.

When the correction was made, the allowable was -- the actual volume was still incorrect. Musselman, Owen & King continued to follow along with that.

And it wasn't until spring of 91 when Amoco went back and analyzed all of the figures

in the proration schedule versus what the actual production was that not only the state, but Musselman, Owen & King discovered that there was overproduction in excess of what would have been allowed under the normal circumstances.

Q. And what resulted from the discussions among the state and by Amoco and Musselman, Owen & King?

A. We negotiated with Amoco so that we could -- or that Musselman, Owen & King could continue to produce their well without being shut in until the allowable was made up. And the agreement that we struck was that MO&K could produce their well at 1.6 million a day versus a volume that would probably be two- to two-and-a-half times that amount until the overproduction was worked off.

Q. You mentioned the two- to two-and-a-half times. That would mean under its allowable, its 50 percent, or 52 percent allowable would allow it to produce at twice the 1.6 million rate?

A. Yeah. For instance, if we were not overproduced, .57 of the allowable from March through October would have been something like 75

million a month. And we've been producing anywhere from around 30 million to 45 million a month in conformance to the agreement.

Q. Okay.

A. There was actually a three-way agreement between the OCD, Amoco, and us.

Q. And lately you've been producing much less than that 1.6 million a day?

A. Yes. It was a combination of concern over a report that Gist & Statton gave to us last spring over drawing water into the wellbore. It was also based on the new agreement that we made with the OCD and, in addition, price considerations, when prices dropped to the lower levels in the summertime.

Q. And finally, would you discuss how the penalty or the allowable for MW/Apache's-Smith Federal No. 2 well came about.

A. It was under the same -- I'm sorry. Apache-Smith 2?

Q. Yes. The one we're currently here for today.

A. As I remember, it was a similar type of calculation to what we used when we established our well.

Q. And MO&K agreed with Amoco on that penalty?

A. Yes, we did.

Q. And did not protest the hearing wherein that penalty was granted?

A. We did not.

MR. BRUCE: Thank you, Mr. Examiner.

EXAMINER CATANACH: Any cross, Mr. Carr?

MR. CARR: Just a couple.

EXAMINATION

BY MR. CARR:

Q. When did you become concerned about this rate sensitivity issue?

A. Our proximity to the flood front moving from the northeast to the southwest has always been a consideration. There was a well drilled by BHP in Section 36 just north of us that did the same thing.

The original well in the section watered out. They moved away from the encroaching flood front and got a new well, a good well. We drilled our well right after that using the same theory and obtained a good well.

Q. If it's always been a consideration,

when, I guess my question is, did you start curtailing production from your well to try and deal with this water coning problem that Mr. Statton mentioned?

A. We originally, like I said before, we were concerned about it from the first. We did a study -- I did a study of the production in proximity to our lease, looking at the dates when water originally began to be produced from the wells and the dates that the waters were completely consumed by water production and the amount of gas that was produced between those two dates.

And we assumed, because of all the other wells that had watered out, they had made anywhere from maybe a Bcf to three or four Bcf in that interval, that if at some point our well began to show signs of making water, that we could reduce the rate and conserve. But up into that point we wouldn't have any indication that the water -- the flood front was upon us.

Q. When did that occur? When did you actually curtail production because of this problem of water?

A. Okay. Our well was not making any

unusual volumes of water until -- and I have to correct Mr. Statton -- it was around the first week in October. We had been shut in prior to that for two to three weeks because the Marathon plant was down.

We had always been concerned because of variations in the line pressure in the field because since Marathon had installed new compressors, the line pressure had been dropped. But it varied as much as 200 to 250 pounds from day to day, thereby, one day with low line pressure it would pull real hard on us; the next day it would be higher and our well would be curtailed somewhat because of line pressure.

We were concerned about this, and Marathon shut their plant in, so we were shut in for two to three weeks. And when they turned back on, the line pressure was lower than anticipated. And it pulled our well exceptionally hard, and within a couple of days, we began to make water.

Q. So then did you then at that time begin to curtail production?

A. We did.

Q. When would that be?

A. It would be right at or right after the first week in October.

Q. When the agreement with Amoco concerning the penalty was worked out, was it my understanding of your testimony that basically the same factors were used as when the penalties were imposed on your well?

A. Yes.

Q. Those are basically the factors that Ms. Leonard talked about?

A. Yes, the original agreements.

MR. CARR: That's all I have.

THE WITNESS: That's why -- I'm sorry. If I might say, that's why we didn't protest their calculation of their 49 percent allowable because we thought they ought to be able to produce that amount but not an excessive amount because of proximity to the flood front.

Q. (BY MR. CARR) Did you discuss the proximity to the flood front or the lease lines in those negotiations, or do you recall?

A. Well, as Mr. Statton stated earlier, and no disrespect to the Commission, but we were just doing business as usual. And business as usual was using those three calculations and not

some form of reservoir data, which to my knowledge has never been used.

MR. CARR: That's all.

EXAMINER CATANACH: Mr. Kellahin.

MR. KELLAHIN: Let me follow up on these last comments.

EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Headrick, you said the three-factor formula was business as usual?

A. Well, as far as determining an allowable percentage on unorthodox locations. Not business as usual for us, but just as far as we understood it was determined in the state of New Mexico.

Q. Other than the Musselman well and the Apache well, can you cite me to any other penalty order in this pool that uses those three factors for this penalty?

A. I believe the BHP well in Section 36 north of us used that.

Q. Any others?

A. That's the one we keyed off of when we did our presentation and obtained waivers from offset operators. And as I remember -- I don't

have it in front of me -- but as I remember, the Amoco proposal to us was almost verbatim off of our proposal --

Q. Thank you.

A. -- our original proposal.

EXAMINATION

BY EXAMINER CATANACH:

Q. Might it have been a better idea to curtail your well from the date of first production?

A. Without a doubt.

Q. But you did not do so?

A. We -- as I stated earlier, I think that it's -- hindsight is fabulous in this case. We thought that from looking at the other wells that have watered out to the north and east of us that we would have ample warning in the form of small incremental amounts of water being produced at first so that we could bring our production down to a point where we could make it live as long as possible after water began to encroach.

In hindsight we believe, and it's my opinion, that these rates probably should have been reduced, you know, before we did reduce them because of reservoir factors.

EXAMINER CATANACH: I believe that's all I have. Anything else of this witness?

MR. STOVALL: Yes.

EXAMINATION

BY MR. STOVALL:

Q. Back to one -- keep going back to this agreement thing. What is your understanding of the purpose of a penalty in an unorthodox location situation, penalty against a well or restriction, whatever you want to call it?

A. My original understanding was that the state of New Mexico did not encourage unorthodox locations, especially at the time that we were applying for ours and that any offset operator who had an interest, regardless of which side of the section he was on from the well in the unorthodox location, that he could protest.

Q. Is it your understanding then that the penalty -- the purpose of the penalty is to discourage unorthodox locations, or does it have another purpose?

A. That's what we were told when we applied for ours is that the state of New Mexico had discouraged them. But as long as we could -- as the operator could come to an agreement

outside of the hearing process on establishing a reduced rate, then the OCD would allow it.

Q. What if I told you that the real purpose of the -- I should use the term "restriction" rather than penalty, although we've always used penalty -- is to negate any advantage that an operator gains from moving closer to another operator's tract in terms of draining that second operator's tract?

A. Well, yeah.

Q. Does that make sense to you?

A. Sure. That's -- we assumed that's where it originally started and because of that then the OCD discouraged unorthodoxed locations.

Q. The reason it discouraged them is to prevent the drainage from -- and the whole reason for spacing rules in the first place is to try to have a well drain its own proration unit rather than offsetting proration units.

A. Right. We assumed that without those guidelines that any operator could go -- put a well anywhere they wanted to on their lease and drain offset.

Q. Sounds like spindle top to me.

A. Yeah. So we agree with the reasoning

behind all of it. And as long as there's an agreement with offset operators, then --

Q. Well, then all the testimony here, and again we're going back to the same point that's been raised, is that this unorthodox location is not likely to cause any, if you will, excess drainage off the Musselman tract; is that correct, because it doesn't get any closer to it?

A. Yeah. Our contention all along has not been that we're concerned about their draining our reserves, per se. We're more --

Q. Okay. Let me stop you right there. Your concern has to do with this thing about the water coning and the --

A. Yeah.

Q. -- if you would draw too fast, you would bring water in and all those problems?

A. That's correct.

Q. Again, if they put their well at 16 -- what is it 1650 -- 1650 of the corner, they're probably actually a little closer to your well, a little further to the east, doesn't that have a greater potential to bring water in and you've got no recourse because you don't have an unorthodox location situation in which to try to

enforce some restriction; is that correct?

A. Yes. There's no immediate remedy as far as the Commission goes, as far as I'm aware of. But the closer the proximity to the flood front, the more likely they are to draw water in.

Q. In other words, the closer they got to the flood front and the closer they got to your well, yet you'd have no remedy in that case; isn't that correct?

A. Well, not so much the closer they got to our well as they are to the flood front. Those two wells essentially, if I might, it's my opinion that those two wells, although they're legal distance apart, even now in their current situation they create a localized pressure sink that draws water and gas to them.

Q. I will express to you my concern again, as expressed to Mr. Statton, is that you're in an unorthodox well case which is encroaching upon property which is not yours, trying to impose a penalty that's designed for a different purpose, to prevent the aura of water coning and drawdown, and then when you look at the manner in which the penalty is applied, again the question of percentage of an allowable, it doesn't

necessarily accomplish that because the allowable is high enough you've still got the same pressure drawdown, even if you impose a very significant production restriction; is that not correct?

A. Well, I think that it would take a very exhaustive pressure study of the area in order to arrive at the optimum withdrawal rates from not just our well or their well but all wells. But it's my understanding that, as we discussed earlier, that the purposes of these penalties is to not only protect the offset rights of other offset operators, but also to conserve resources.

And I think that by preventing, in whatever manner we can within reasonable bounds, economic bounds, the encroachment of waters, then we're protecting our rights. But also I think that -- I mean it's our opinion that Apache will be, by lowering their rates, will be protecting their resources under their lease also.

Q. If that makes good engineering sense, presumably Ms. Leonard will figure that out. They may start seeing water in that well, I guess. I guess what I'm saying to you is we could impose a 10 percent allowable on that well,

well then they just say, "Let's go back to an orthodox location and drill again," if they didn't get enough gas, and they aggravate, perhaps, that problem rather than mitigate it.

Once again, I'm concerned that we are in the wrong case to accomplish what you would because we're looking at unorthodox locations on a well-specific basis, and what you're talking about is a reservoir management situation.

A. Well --

Q. So I suggest you think about it. That's not a question. That's a statement. So I don't know that -- I understand why you're here. It's the forum you've got right now.

A. We agree with you. It probably ought to be addressed in the future because the Indian Basin field is a huge resource that needs to be managed. And the edge wells all around this field are going to have this problem from now on. And the withdrawal rates in the field, whether they're up on top of the structure or right next to the flood front, are going to have something to do with the amount of gas that's produced out of the field ultimately.

MR. STOVALL: And I'll be a little

heretical and say that the other four might be the allowable here in the semiannual allowable hearing. Familiarize yourself with that process to determine how allowables -- that will get my engineer all excited when I start talking about that.

But I have nothing further.

EXAMINER CATANACH: Anything further of this witness? If not, he may be excused. Would counsel like to give brief closing statements?

MR. KELLAHIN: We waive closing statements.

MR. BRUCE: Mr. Examiner, let me first address Mr. Stovall's suggestion about lack of jurisdiction. I think Musselman, Owen & King is trying to protect their correlative rights, which is certainly within the OCD's jurisdiction. And although the MOK people state that they're not concerned about drainage, obviously if their well waters out quickly, those reserves will be captured by someone else, not by Musselman, Owen & King.

Furthermore, when you talk about this is the wrong forum to assess a penalty because of the, in effect, the location of the Apache well

standard as to Musselman, Owen & King, I would raise the issue of the Stevens Operating case wherein a penalty was assessed against a well at a standard location in an oil pool in effect.

So I believe the OCD does have jurisdiction to do what's necessary in this case to protect the rights of offsets, including those of Musselman, Owen & King.

MR. STOVALL: Let me make the record clear so that you understand it. I am not suggesting that they don't have the jurisdiction in this case. I am suggesting that we may not be addressing the right issues.

MR. BRUCE: I'm raising that just to make my record. MOK agrees that MW/Apache isn't moving closer to MOK, but as has been stated, that's not the problem. The problem is water encroachment. Apache's own witnesses stated the water is coming down from the southeast. Obviously, it will reach the MOK well well before it reaches the Apache well.

The Musselman well began producing water approximately two months ago. And combined with the report of water in the Amoco and now Apache Smith No. 1 well, there is a doubt where

the flood front is. It could be close; it could be relatively far away. But I think action needs to be taken to protect the resources in this field.

MW/Apache, in essence, seeks to increase its allowable, its production rate, by 60 percent. The current allowable factor is 48 or 49 percent, and they seek to increase that to 77-and-a-half percent. That's a substantial increase.

Musselman, Owen & King is afraid that this may cause a more rapid watering out of their well, therefore causing wasted reserves and, as I stated, adversely affecting their correlative rights.

For that reason we believe that you must leave the distance method in the penalty calculated by Apache. The nearness to the section line clearly allows MW to -- it appears to obtain a better well, and this increased production will affect Musselman, Owen & King.

MOK is sympathetic to their plight. Obviously, MOK has an unorthodox location, and both companies clearly want to drain what's under their sections. In fact, MOK does not agree to a

small increase in the allowable. We do not think that will unduly harm the MOK well. But we don't think there should be a 60 percent increase in the allowable.

And for that reason we would suggest that if this application is granted, that any increase should be kept relatively small. I think during the winter months, the allowables on these wells are quite high. And as pointed out by Mr. Stovall, even a small increase in the allowable would allow substantial additional production.

Thank you.

EXAMINER CATANACH: Mr. Carr.

MR. CARR: May it please the Examiner, this is a strange case. What we have is a situation where Apache/MW takes over a property from Amoco, and they drill a well that has been approved by the Division with a penalty imposed based on assumptions.

When the well was drilled, the assumptions don't match information from the reservoir. And so they're before you today seeking an adjustment in the penalty.

We can't tell you why a penalty is

appropriate at all. We're not encroaching on anybody but ourselves, but for some reason we've inherited the well with an order that imposes a penalty, the data underlying that penalty calculation has changed, so we're asking for a similar change.

Musselman, an offset operator to the north, comes in and objects. They're closer to the common boundary than we are. They admit that they're not concerned about the location. They're concerned about withdrawal rates, and their concern stems from the fact that their well is making water because it's close to a flood front.

We get some suggestions that what we ought to do is balance withdrawal rates between our well and theirs to deal with the problem. Certainly that misses the point. If there is a legitimate question concerning withdrawal rates, that would apply field-wide. It would apply to every operator in the field.

And, in fact, just because somebody happens to have a well positioned near to a waterfront doesn't mean necessarily, without any evidence to support it, other than just

speculation, that we should come in and start looking at an allowable hearing or changing the rules at all.

That's another case. That's another day. If that comes up, Mr. Kellahin and I will really be on the same side and sure, because we'll be opposed to the reducing of these allowables just because one well is near a waterfront.

It's a bizarre case, but it doesn't have to be because when you're asked to decide a case, Mr. Catanach, what you look at, I assume, is the application. I assume you look at the rules. And I assume you review the record. I have no reason to think you do otherwise.

When you look at the application, there's one thing before you, that's an adjustment in penalty. When you look at the record, only two people testified and presented evidence. Musselman says they could, but they didn't. They come and say, "Well, we don't believe their evidence." That's argumentative, and that's not supported by anything they've put in the record.

Look at the record. Two expert

witnesses qualified. Two people presented data, and both of them showed that the reservoir doesn't match the assumptions that were used in setting this penalty. For that alone I think you need to, when you review the record, look at what MW and Apache has presented.

Then you also have to take that information and, Mr. Catanach, you have to look at that information in context of the rules. This isn't just an equitable forum where in the context of the unorthodox location case we can come in and talk about maximum efficient rates, balancing equities, whatever else, if studies were done, which haven't been done.

We're talking about a penalty for an unorthodox location. And the authority that you have to look to is Rule 104-G. And that rule says that whenever an exception -- we're talking about location exceptions -- whenever an exception is granted, the Division may take such action as will offset any advantage which the person securing the exception may obtain over other producers by reason of the unorthodox location.

You see, this case falls even outside

the statute if you're to impose a penalty. What we have here is no advantage being gained on another producer -- we're only encroaching on ourselves -- and no advantage being gained by reason of the unorthodox location.

Why should there be a penalty? We submit if you look at the rules, if you look at this application, and if you look at the record, the only thing you can do is grant a 77.5 percent production factor or really follow the law and the rule and impose no penalty at all.

And if Musselman has a legitimate concern that is field-wide and not just a factor of the particular geology and then the engineering facts that surround their well, which was drilled years after other people developed the pool, if they have a real complaint and a real concern, this forum remains open and is qualified to review technical data when it is developed that addresses this waterfront and water coning problem. That is not the question before you today.

When you review this case, we ask you to look at the application, review this record, and compare that to the rules of this Division,

and when you do, you will grant the application of Apache and MW Corporation.

EXAMINER CATANACH: Thank you, Mr. Carr and Mr. Bruce.

Is there anything further? There being nothing further, Case 10412 will be taken under advisement.

(The proceedings were concluded.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10412, heard by me on December 5 1991.

David Catanach, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

I, Debbie Vestal, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I caused my notes to be transcribed under my personal supervision; 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 December 17, 1991.

Debbie Vestal

DEBBIE VESTAL, RPR
NEW MEXICO CSR NO. 3