STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

EXAMINER HEARING

IN THE MATTER OF:

Application of Marathon Oil Company for an unorthodox gas well location and simultaneous dedication, Eddy County, New Mexico. Case 9802

TRANSCRIPT OF PROCEEDINGS

BEFORE: VICTOR T. LYON, EXAMINER

STATE LAND OFFICE BUILDING

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HEARING EXAMINER: We call next, Case 9802.

MR. STOVALL: Application of Marathon Oil Company for an unorthodox gas well location and simultaneous dedication, Eddy County, New Mexico.

HEARING EXAMINER: Appearance.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin, Kellahin & Aubrey appearing on behalf of the applicant, Marathon Oil Company, and I have one witness to be sworn.

HEARING EXAMINER: Other appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the law firm Campbell & Black, P.A., of Santa Fe. I represent Oryx Energy Company in opposition to the application and I have two witness.

HEARING EXAMINER: Let the witnesses stand to be sworn.

(Witnesses sworn.)

HEARING EXAMINER: Mr. Kellahin, you may proceed.

MR. KELLAHIN: Thank you, Mr. Examiner.

Mr. Examiner, before we begin the presentation of the technical evidence, there is some housekeeping chores that I'd like to undertake at this

point. First of all, with regard to how the case got before you today, it originally arose out of an administrative application filed by Marathon Oil Company back, I believe, on October 5th. Mr. Steve Daniels for Marathon filed a request for administrative approval of this location.

The well is in the Indian Basin pool and the Indian Basin pool for the Upper Pennsylvanian has some specific rules. The first one of which is well spacing, is 640 acres per pool and well setbacks are 1650 from the side boundaries.

He filed that application, and upon receiving that application, Mr. Stogner recognized that while it had been filed under the attempt to get administrative approval, it was not eligible for that purpose and placed it on the docket today, November 1st. When that was done at my request, I asked Mr. Daniels to provide supplemental notice to anyone in the area that might have an interest in the location of the well. And that was done.

Mr. Carr originally had filed a request for a continuance on the notice question. He is the only one of the parties for whom supplemental notification was sent that has either contacted me or that I'm aware of that has any concern about the well location.

But there is a threshold notice issue because my understanding of the procedure of the division are that there really is not a mechanism for additional notification once the division makes the decision to take an administrative application and set it for an examiner hearing.

Now, Mr. Daniels is available to testify if this is necessary, but his testimony would be that on October 5th, when he sent in the administrative application, copies of that were sent by certified mail to all operators in the immediate area that might have any concern, but the evolution of the case is not in the conventional examiner hearing posture.

And Mr. Carr originally raised that issue and, I think, has withdrawn his request to have the case continued, but we might want to discuss that on the record so the notice question is satisfied.

HEARING EXAMINER: Yes, I have the correspondence that you mentioned, and we have it in the file, except it is in the file for Case 9802 and the correspondence referred to Case 9820.

I can understand the question of the notice, and in my opinion as an engineer, I think the notice was adequate. And fortunately all parties --

MR. STOVALL: Mr. Examiner, perhaps you

ought to hear from Mr. Carr before we go any further with the discussion. If he has anything he would like to add to this?

MR. CARR: No, I think Mr. Kellahin is correct. We were concerned that the purpose of providing notice 20 days before the hearing is to give an interested party an opportunity to prepare. We received actual notice of the hearing. It was on October the 20th, and when we were looking at this matter last week we were concerned about being able to be ready be here today.

We are, however, prepared by appearing, we waive any objection, I believe, to notice.

And although I wouldn't want this quoted back to me some day, we have been able to prepare and certainly do not have objection, in fact, decided to go forward with this hearing.

HEARING EXAMINER: May I ask you, Mr. Carr, the way this thing developed, it made me wonder whether Oryx would have objected to the administrative approval of this application?

MR. CARR: I don't know.

If we had --

HEARING EXAMINER: And it seemed a little strange that they would not but would object to the

application here.

MR. CARR: Well, it was set before the time ran for filing an objection, so that's probably -- I mean we could speculate, but we might have waited to the 20th day. I doubt that we would have. I don't know.

MR. STOVALL: Mr. Kellahin, may I ask you a question. Mr. Carr has withdrawn his motion and objection to holding the hearing today. So I assume there is a reason for your bringing up the issue.

MR. KELLAHIN: Oh, there is. This is a convenient vehicle, perhaps not this specific case, but it reminds us all that there is apparently some gap in the notice procedures, in the notice rules when an applicant files an administrative application and the division personnel that are reviewing that determine they can't approve it and set it on an examiner hearing, even in the absence of objection by a party to be notified. It was just an opportunity for me to say I'm concerned about that issue and maybe we need to all address it at some time.

MR. STOVALL: I appreciate your concern. Let me just speak for the legal division of part of the division for a moment. I appreciate your concern and it's an issue of which I'm aware of. I think

rather than spend the time on this record and your client's time and money discussing this with you, I would appreciate some suggestions and input from you off the record and informally, and perhaps a procedural or rule change would be appropriate to address the problem, because I think it's a legitimate problem. I mean you just look at the timing of this case, everything was done in a timely manner, it became physically impossible to get timely notice.

MR. CARR: And there is a question even beyond that about whether or not it is timely notice. It may be.

MR. STOVALL: And the question is whose burden is it to give notice.

MR. CARR: I think it needs to be clarified at the appropriate time. It's the first time in my experience this particular question has come up.

MR. KELLAHIN: One other comment before I present Mr. Carlson's geology, is that the case is docketed for simultaneous dedication of two wells to 640, and I believe that's way Mr. Stogner wrote the ad, but that was not our intent.

What we're trying to ultimately achieve is the opportunity to drill a replacement well. The proposed well at the 1650 from the west line, 330

location from the south line of the Section No. 9, is a replacement for the No. 5 well.

I'll speculate on what I thought Mr. Stogner was doing when we wrote the ad is sometimes the timing sequence is that you need to have them both, at least temporarily, on the books as being dedicated to the spacing unit as you make the transition from one producing well to the second producing well. But the No. 5 well, in fact, has been shut in for months.

HEARING EXAMINER: I see.

MR. KELLAHIN: And so what we want to request from you is the mechanics by which we will drill a replacement well if the location is ultimately approved.

So I did not want to leave that without comment because we don't propose to share an allowable or a spacing unit between two wells.

HEARING EXAMINER: All right. Thank you for that clarification. Would you like to proceed?

MR. KELLAHIN: Yes, sir.

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Carlson, would you please state your name and occupation?

A. My name is Eric Carlson, and I am a petroleum geologist.

Q. Mr. Carlson, by whom are you employed and in what capacity?

A. I am employed by Marathon Oil Company as a development geologist. I've been in two other locations before here but for the last two years one of my responsibilities has been the development geologist for Indian Basin field.

Q. Have you on prior cases testified before the New Mexico Oil Conservation Division?

A. Yes, sir.

Q. As a development geologist for Marathon Oil Comany with responsibilities for the Indian Basin pool of Eddy County, New Mexico, have you kept yourself informed about continuing drilling and development and production within the pool?

A. Yes, sir.

Q. And have you kept yourself informed with regard to the available geologic information and datum?

A. Yes, sir.

Q. And based upon that data, have you reached certain conclusions with regard to how to further develop Section 9 in Range 21 South of Range 23 East?

A. Yes, sir.

MR. KELLAHIN: We tender at this time, Mr. Examiner, Mr. Carlson as an expert petroleum geologist.

HEARING EXAMINER: Mr. Carlson is so qualified.

THE WITNESS: Thank you.

Q. (BY MR. KELLAHIN) Mr. Carlson, let's take what I have marked as Marathon Exhibit No. 1, and before we discuss your conclusions and some of the details let's take a few moments and orient the Examiner as to specifically what he is looking at.

When we look at Exhibit No. 1, are we looking at all or simply part of what is defined as the Indian Basin pool?

A. We are looking at the northwestern portion of the pool, specifically, Township 21 South, Range 23 East, that's approximately a third of the area of the pool.

Q. Within the pool, what is the predominant producing formation?

A. It is a carbonate of Pennsylvanian age called the Upper Penn or, if you will, some people will call it the Cisco.

Q. When we look at the area contained on the

display, you have provided an index in the lower left margin of the display. Let's go, first of all, before we talk about the index, let's talk about the type of geologic display this is. What is this?

A. This is a structure map on the top of the Upper Penn. It's a subsurface map. As you can see, the scale given there is approximately an inch and a half to a mile. In addition, there's certain other information on this map. For instance, the North Indian Basin Unit boundary is displayed upon this map in the north central part of township.

Q. Let's take a moment now and make sure the Examiner understands the significance of the area defined as the North Indian Basin Unit. Again, now, how is that shown on the display?

A. All right. That is shown by a series of rather squat-shaped dashes, very short dashes, within the boundary of the unit. For instance, to give you an example, Section 2 in the northeast corner, you will see a series of -- right along the section line you will see a series of hashers, that's the word, hashers, that run across the north boundary of 2. From Section 2 the northeast corner it runs to the southeast corner of Section 11, across the south boundary of 11. The unit also includes the North 1/2

of Section 15, and all of Section 16, 9, and 10. The unit also includes the South 1/2 of Sections 3 and 4.

Q. When we look at the index for the display, the last entry next to the hashered line says NIBU, that is the North Indian Basin Unit?

A. Yes, sir.

Q. When we look in Section 9, am I correct in understanding the display shows the entire Section 9 contained within the boundaries of the North Indian Basin Unit?

A. Yes, sir.

Q. As well as Section 16?

A. Yes.

Q. And that is a unit that is operated by Marathon?

A. Yes.

Q. What is your understanding, Mr. Carlson, of the method of participation of the various interest owners within the unit? Will they participate in a given well based upon the spacing that the division applies for a given well, or do they participate on an equitable basis, regardless of where the well is within the unit?

A. They participate on an equitable basis regardless.

Q. So if the well is located as you propose in Section 9 in the Southwest 1/4, the owners in Section 16 are going to receive their proportionate share of that production on a unit basis?

A. Yes, sir.

Q. Let's look at some of the other information that's on the display. There is a line of cross-section shown in the southeast corner of Section 8 running to the well in the Southeast of 16?

A. Yes.

Q. What does that represent?

A. That line of cross-section represents a transect across a portion of the reservoir from Section 8, where a well which was drilled in June of 1989, was DST'd and produced only mud, no gas, to Section 16, where that particular well has produced 24 bcf of gas. So we see a change in reservoir quality along that transect.

Q. When we look at Section 17, to the south and west of your location, what is your understanding of who the operator is for the well in Section 17?

A. I am under the impression that Oryx is operating that well.

Q. Let me ask you first of all, what were you asked to do as a geologist with regard to this

geologic study?

A. I was part of a team to pick a replacement well location in Section 9 for the North Indian Basin Unit Well No. 5.

Q. In order to prepare a geologic study to come to a conclusion about where to place the replacement well in Section 9, what did you do?

A. We looked at available data, particularly well logs out here. We also looked at what we know about the field in general. For instance, it's been fairly well established -- it's been established that we are looking at a field, a reservoir, that has been trapped by a complex structural stratigraphic trap.

The fault that you see in the left-hand portion of this exhibit you will see is down to the west, this fault is, from what we can tell, a sealing ceiling fault. It extends the length of the field.

Similarly, we have located to the northwest of our Section 9 -- actually, we see it kind of trending from Section 18 to Section 4 -- the limit of the reservoir. Past this point we just cannot produce any hydrocarbons at all, and it's a complex stratigraphic limit, but that's another trapping phenomenon for this reservoir.

Now, the dip of the reservoir is to --

generally here, the East Northeast. We can see from the well control that we have established from the northeast corner of Section 2, to the northeast corner of Section 24, the original gas/water contact.

Q. Let's take a moment and make sure I've got that identified.

A. That is a simple dashed line, thinner than the line that is the limit of reservoir.

Q. It's up in the northeast corner the display. It returns vertically through the eastern edge of Section 2, 11, and then takes a northwest southeast diagonal through 13?

A. 13 and 24.

Q. That's the original gas/water contact?

A. That's the original gas/water contact. We have seen through the production history of this field migration of this gas/water contact westward and southward. So that today the current gas/water contact from this year is now approximately one mile west and is shown by the hashered line with sort of the racing stripe, if you will.

So that runs from Section 3, as you follow due south to the east corner of Section 15, and then trends south, southeast, towards Section 36 and follows the structure in general.

We believe this is a structural trap in that sense, and that we have a strong water drive that is pushing, to some extent, gas westward. We are certainly filling up from the east, northeast. So with this information, we then look to replace well No. 9.

Q. What is the criteria that you use after having studied the available geology to determine what then is the best location for the replacement well?

A. Well, because the water is coming in from the east, we decided it would make no sense to offset the well to the east. Rather, we should work to effectively drain the rest of the section, Section 9, after the water came up to that well. So we decided we needed to go south and west. Now, our first inclination was to go to a location 1650 from the south line of the Section 9, 1650 from the west line of Section 9.

Q. That would be the closest standard location available in the spacing unit out of the southwest corner?

A. That is correct. However, for a true geologic reason, we had to move the location. Now, we were presented with some facts. First, the well in Section 4, which you see on this map, produced only a

half bcf today. Which, essentially, is a marginal well. It's in the reservoir, but it's out of the economic pay facies. Economic pay facies is a dolomite. This well is in a lime.

I have a display in which we can show the Examiner where the facies line between dolomite and lime lies.

Q. Let's do that, Mr. Carlson. I show you what is marked as Exhibit No. 2, and ask you if that is the lithology map that you have prepared that helps identify and describe the lime dolomite transition?

A. Yes, sir, it is. We see once again the well in Section 4, which is in lime, a marginal producer, half a bcf.

Now, as we continue inside the reservoir limit which is marked the same as on your last display, the solid dashed line, we see lime to dolomite line is the crosshatch line. We come south from Section 4, and a little west into Section 8, to our well that DST'd only mud. Clearly a subeconomic well. They didn't do any more work with it.

We come to Section 18, which is also in the lime. These two wells'were drilled a little while ago. The well closer to the center of section and IP'd for two million cubic feet a day. Not very

impressive by Indian Basis standards, so they drilled a second well southeast of that, 1200 from the south line and only 330 feet from the east line. In which even though they were still in limestone, they potentialled that well for 24 million cubic feet a day, and it's been a very successful well for them.

Q. Well, I've lost track of your well. Are you looking at the well in Section 18?

A. Yes. I've just talked about two wells in Section 18.

Q. Let's talk again about the well out of the southeast corner of 18.

A. Yes, sir.

Q. That appears to have a footage location of what --

A. It's 1200 feet from the south line, and 330 feet from the east line. And that's just into the limestone. That's just into the limestone, and so it's close enough to the dolomite facies that at least will give you a good test.

Q. Is that a well that is dedicated to the Indian Basin Upper Penn pool?

A. Yes, sir.

Q. It has drilled at a location 330 to the common line between the two sections?

A. Yes, sir. That was an unorthodox location at the time. So, finally, just to --

Q. Let me make sure I understand. Between the transition between the limits of the reservoir, which is north and west of that well in 18?

A. Right.

Q. That is your opinion about the limits of the reservoir?

A. Right.

Q. Between that point, as we move to the south and east, we go through a lime-dolomite transition?

A. That's correct.

Q. Yet within the lime there's occasions where you do commercially produce the gas in the reservoir?

A. Right. But only if you're very close to that dolomite.

Q. When we follow that area between the limits of the reservoir and the lime-dolomite transition, and we move to the north and east and we get up into Section 8, which is that, the southeast, southeast corner?

A. Yes, sir.

Q. What happened with that well?

A. That well was drilled in 1989. Had a great influence on our location, as a matter of fact, when

we picked our location. They drilled that well, spotted the end of May. In June they tested the Upper Penn, they found that, A) it was limestone on their logs, and B) that the drill stem test produced only 200 feet of mud and had a shut-in bottom hole pressure of about 900 pounds after four hours.

Q. And that well was drilled at a location that is 330 off the northern boundary of Section 17?

A. Well, the actual location --

Q. 660. I'm sorry.

A. The well we're speaking of was drilled by Santa Fe Exploration, the southeat corner of Section 8. It was 660 feet from the south line of Section 8, and it was 660 feet from the east line of Section 8. So we felt that's very close to the southwest corner of Section 9, where we would be putting a well.

More important, though, we can now draw a line of vision, if you will, between that dry hole in Section 8 and the marginal producer in Section 4. Both of those wells are in the limestone. We want to stay out of that limestone because we want to make a good well. So we have moved southward from the legal location, which would have been very nearly in a direct line between two -- well, one's a dry hole and

the other is marginal -- two wells that no one would drill if they had the information they have now.

Q. Why don't we compare Exhibit 1 to 2. We take Exhibit 1, which gives us the structural information; we take Exhibit 2 which shows the lime-dolomite transition. Summarize for me again, then, the integration of those two elements to satisfy your criteria about the optimum location for the replacement well?

A. Very simply, we knew we wanted to go south and west, so that the replacement well would produce as long as possible, because the water is coming in from the east, eventually the eastern part of the section is going to be the first to water out as you go up. So we wanted to get up structure to the south and west. We had to move the location from the legal location because of a stratigraphic concern. We have a facies boundary between the highly productive dolomite, which is most of the pay out there and marginally productive lime. If we were to place our well at a legal location, we would be in the lime. So we looked for the best place to put that well strategraphically and structurally.

Q. Describe for me the information available on No. 5 Well, which is the original well, in

Section 9 that you're seeking to replace.

A. This well is truly a well that needed to be replaced for mechanical reasons. In 1988 this well produced gas and water. Throughout the year the well produced increasing amounts of water. In January 1989, production ceased from the well. My engineering buddies went in and attempted to swab the well. After several attempts in the spring they could not get down to the bottom to swab the well. Later on in the spring they attempted to run a shut-in bottom hole pressure survey in the well, and once again they could not get down.

Significantly, if you look to the east of Section 9, there is a well in Section 10 that is still making 1.8 million cubic feet a day of gas. So very clearly the water which we know is moving slowly from the east in this area has not reached the well in Section 10. Since the well in Section 9 is updip of the well in Section 10, we conclude the water contact has not reached the No. 5 well in Section 9. Therefore, we now believe it's a mechanical problem in Section 9.

Q. As opposed to simply having the original well in Section 9 -- the No. 5 well being watered out?

A. Correct. It was not just watered out,

because a down dip well in a strong water drive system is still producing very good commercial quantities of gas, 1.8 million cubic feet of gas per day.

See, the real shocker to us was that corner shot in the southeast corner of Section 8, because what it did was it brought that limit of reservoir lime and also the limit of the dolomite line further southeast than we would have originally put it. And so we don't want to get any closer to that than what our legal unit boundary setback is, which is 1650 feet. And we certainly don't want to be north in Section 9, because we're going to get into bad rock.

Q. Why did you charactize the well in the southeast corner in Section 8 as corner shot?

A. Well, specifically, it appeared to us that that particular well was drilled in an attempt to get updip of our reserves in Section 9, and with the water drive, effectively produced those reserves. It was already established from two other dry holes in Section 8, that the limit of the reservoir was somewhere in southeast corner of Section 8.

Q. Can the Marathon location that's the subject of that application be characterized by the way you describe a corner shot as a corner shot?

A. No, sir, I do not believe it can. First of

all, Marathon is in compliance with the setback that was established for the North Indian Basin Unit. We are 1650 feet from the west line of that unit. So we are 1650 feet away from the outer boundary of that unit. We're playing by the rules here. Similarly, because the very poor reservoir quality that we see in the southeast corner of Section 8 probably extends into the northeast corner of Section 17, such that no one would drill a well there.

Now that we have this new data from Santa Fe Exploration's well, no one would drill in the northeast corner of Section 17. It's not an economic reservoir. And so between our location and the -- our proposed location, I should say, and Oryx wells in Section 17 and 20, there is nonreservoir rock, basically, nonprospective rock.

Q. Is there any significant difference in the size of the reservoir when you compare Section 9 to Section 17?

A. Not in the area. No, there is not that much difference.

Q. The encroachment, if you will, if that's how we define moving towards the southern boundary, will impact the interest owners that own the interest within Section 16, then?

A. That's correct. A reservoir engineer did some calculations for Marathon, a Marathon reservoir engineer, and also we supported those calculations with some computer modeling after that to confirm those calculations, and we see there is negligible effect, at all, from moving that location just those few hundred feet south. Certainly there is some effect on Section 16, but Section 16 is part of the unit.

Q. Let's go now, Mr. Carlson, to Exhibit No. 3, if you will. Would you identify and describe Exhibit No. 3 for us, Mr. Carlson.

A. Yes, sir. Exhibit No. 3 is stratigraphic cross-section whose datum is the top of the Upper Penn. And what it shows us is a transect from northwest on the left, to southeast on the right between the new Santa Fe Exploration Well drilled in Section 8 in June of 1989, and a well that was previously drilled by Marathon, now in the unit in Section 16 to the southeast. And what I am showing with this, is a change in facies between the two wells that explains the utter lack of production in the Santa Fe Well.

So what we see first in the Santa Fe well is a density neutron log. And it's on a line matrix

for those who need that technical input. We see that the density in neutron curves overlap each other and plot directly on the zero percent lime line. This is a nonproductive interval.

We also see in the Marathon well a much older log, a density log, and this log shows that where the curve on the right side of the depth tract is to the right of a particular line I'm showing you now, five chart divisions in from the right, that's the 2.75. That would be the cutoff. Everything to the right of that line is dolomite. It's more dense than 2.75 grams per centimeter cubed.

So we clearly have dolomite on our density log in the Marathon well in Section 16. Significantly, this Marathon well in Section 16 has produced 28 billion cubic feet of gas out of this rock section I have displayed. Significantly, the well, the Santa Fe Exploration Indian Basin No. 1, on the other hand, did not make any gas at all on a DST. It produced only 220 feet of mud. So we see a very real impact of the difference between productive dolomite and too far away to that dolomite in the limestone.

This is the kind of display that I make to convince our management that we cannot drill a legal location in Section 9, but that we must move south and

go through the expense of this type of hearing.

Q. In your opinion does it gain you an unfair advantage over Oryx with the well located as proposed?

A. No, sir, it does not.

Q. In your opinion, should your well location be penalized because of the objection of Oryx to your location.

A. No, sir, it should not be penalized.

Q. In your opinion, is the proposed unorthodox location the optimum location in which to produce the rest of the gas reserves that underlie Section 9?

A. Yes, sir.

Q. In the absence of approval of this location will you be precluded the opportunity to produce recoverable gas reserves that underlie Section 9?

A. If we do not drill here, we will lose some reserves that would have been produced.

Q. Is there still remaining primary production, notwithstanding the production from the original No. 5 well, that is available for production by the replacement well?

A. Yes, sir. When the No. 5 well became inoperative, was shut in, there was still some evidence for remaining reserves in Section 9.

Q. When was the No. 5 well shut in,

Mr. Carlson?

A. January 1989 it ceased production.

Q. In your geologic opinion, Mr. Carlson, will approval of this application be in the best interests of conservation, the prevention of waste and the protection of correlative rights?

A. Yes. And it should help to maximize the gas production in the unit.

MR. KELLAHIN: That concludes my examination of Mr. Carlson. Mr. Examiner, we would move the introduction of his Exhibits 1, 2, and 3.

HEARING EXAMINER: Is there objection?

MR. CARR: No objection.

HEARING EXAMINER: Exhibits 1, 2, and 3 will be admitted.

HEARING EXAMINER: Mr. Carr.

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Carlson, I would like to go to your Exhibit No. 1 to begin with.

A. Yes, sir.

Q. If I understand this exhibit, coming down starting through Section 2 is the original gas/water contact; is that correct?

A. Yes, sir.

Q. When we say original, how long ago was that?

A. This field was discovered in the 1960s.

Q. Early 1960s?

A. Yes, sir.

Q. 1962?

A. It was 1 or 2, like that, yes.

Q. So what we have is about 26 or 27 years --

A. Plus or minus. Sure. I agree with that.

Q. In that period of time your interpretation is that the gas/water contact has moved approximately one mile to the west?

A. Right. In fact, we can even trace how that happened, because on this exhibit we show you both on our well bore spots the unorthodox locations that have been established for the field over the years in this area plus the replacement wells that have been drilled.

If you look, for instance, in Section 11, you will see a well in the northeast corner of Section 11. That well produced for many years, was abandoned, and a replacement well was drilled, actually, at this time on a legal location in the southwest corner. Okay? Now, that well has effectively watered out and it has been abandoned.

Q. Would that be also the case for the well in Section 14?

A. Yes, sir.

Q. When theses wells in Section 11 and 14 actually watered out, can you tell me how many barrels a day they were actually producing?

A. Of water?

Q. Yes.

A. No, I cannot tell you that exact figure. Marathon probably could get that figure for you very quickly, but -- at any rate, you understand that these wells start out as very high rate gas wells. Phenomenal rates. I mean when this field was discovered, they laid a pipeline in Chicago and dedicated this gas. We think it's somewhere like two bcf plus or minus a few hundred bcf.

So, anyway, what happens is the well produces very steadily for a long time, until water encroachment starts coming in it, until the water level comes up. Slowly, the water level comes up -- there becomes a threshold point at which the water production is so great that gas production, basically, almost nosedives. And at that point you say, "Well, we better drill an updip well. You don't necessarily wait until all the gas has been produced, but you

certainly get to the point where you can drill a well updip that will make you a lot of money again.

Q. And my question was if you knew how much water they were producing when watered out. And your answer was you don't know?

A. That's correct.

Q. Do you know what the cumulative water production was on each of these wells at the time they watered out.

A. I don't have that figure with me.

Q. So you wouldn't know how that water figure would compare with the current water production from any other well pool?

A. That's correct.

Q. And if I look at this exhibit, the gas/water contact in 26, 27 years has moved, I guess, up structure, approximately 200 feet; is that correct?

A. Yes, sir.

Q. Do you know what the producing rates in the field are at the present time as compared to an average for the last 20 years?

A. Yes, sir. I, basically, do have some information with me that would establish some of the production data from various wells within that pool.

Q. Is it fair to say that the pool production

at this point in time is less than what it has been in periods in the past?

A. The pool production varies a great deal because of rate takes in the winter months, for instance.

Q. But I would ask you if you have any information on an annual basis. If, in fact, the producing rate from the field isn't down now as compared to the average for the pool?

A. May I consult with my attorney on that for a moment, please?

HEARING EXAMINER: Proceed.

MR. KELLAHIN: Just to see if you can answer the question --

THE WITNESS: No, no, I can't do it. I think there are people in Marathon that can, but I don't have that figure with me.

Q. (BY MR. CARR) The advance of a gas/water contact, if there is one, would be dependent upon the amount of production actually withdrawn from the pool.

A. That's correct. And, of course, what we do know, there's been some pressure maintenance, the pressure has declined somewhat, but there is strong pressure maintenance in the reservoir.

Q. And if the rate of production slows down,

then I guess it would be fair to assume, would it not, that the gas/water contact would advance at a slower rate with less production?

A. I'm not sure that that has been established. You see a lot of studies where people have looked at that question in great detail and find that is not the case and they lose gas reserves, because they're not producing fast enough. Water encroachment keeps coming up on them.

Q. In the 26- 27-year period, the gas/water contact, as you depicted it, has moved about 200 feet; is that correct?

A. That's what I have depicted.

Q. As I look at this, there's about 300 feet additional structure for it to gain before it would get to your proposed location; is that fair? It's approximate, I know.

A. Yes, that's approximately true. That's true.

Q. Now, if we throw out the question of the dolomite, just for the purpose of this question and just for the moment because we'll come to that, moving south to the unorthodox location doesn't actually gain Marathon substantial structural position, does it?

A. What we should say is moving from 1650 feet

from the south line to our proposed location will be essentially moving a long strike. Therefore --

Q. And so the location to the movement was not to gain structural position but to get away from the dolomite; is that a fair statement? I mean from the facies change between the dolomite and the limestone?

A. The location was picked updip because of the structural factors you just mentioned. The location was moved from the legal location because of the stratigraphic factors.

Q. And so just to be sure -- I'm not trying to --

A. Yes, sir.

Q. You went updip from the existing well in Section 9?

A. Right.

Q. So the movement to the west was to get updip, in essence. The movement to the south was for other factors not to gain --

A. The movement to the south was a geologic factor due to the stratigraphy of the reservoir.

Q. Let me go to your structure map for just a moment. I think that's Exhibit --

A. 1, sir. Exhibit 1.

Q. I don't mean that. I mean the cross-section, which I think is Exhibit No. 3?

A. Yes, sir.

Q. I only have one question on that. The trace on your cross-section goes from the Santa Fe well in the Southeast of the Southeast of 8, down to the well in 16?

A. Yes, sir.

Q. Is there any reason you took it in that direction instead of to the old well in Section 9?

A. Yes, sir.

Q. And why was that?

A. The reason is because the stratigraphic variation occurs, basically, in a northwest to southeast direction.

Q. And you think you get a better read on it by using these two and not incorporating the other log?

A. Right. Incidentally, for the record, if we were to draw a section from the Southeast of the Southeast of Section 8 over to NIBU's No. 5, we would be demonstrating the same effect. As geologists, you know, we like to draw our cross-sections perpendicular -- well, actually, we like to draw our cross-sections along the direction of change.

Q. Now, you were involved, you testified, on the team to pick this location; is that right?

A. Yes, sir.

Q. Who else was on that team?

A. Well, you're going to have to write down a lot of names here. First of all, we had Craig A. Kent, a petroleum engineer. We had Timothy A. Dynas a petroleum engineer and operations engineer supervisors. We had K.A. Callick, a reservoir engineering supervisor. We had Louis Doublet, he was a reservoir engineer. Paul Benifell, I believe, had a slight -- he is also a petroleum engineer that was a reservoir engineer at the time. Randy J. Bruner, who was the region development geologist. Carl Hubacker, who is the district engineer for the Midland District, Mid-Continent Region, Marathon Oil Company.

We had William O. Snyder, III, who is the production manager for the Midland District, Mid-Continent Region of Marathon Oil Company. We had several techs who were involved in gathering of data, for instance, Chris Eustus, who was working for Mr. Dynas. We had some help from Gail Graham, who was a tech working for K.A. Callick. We had some help from Johnny C. Reyes, who is a tech working for us. Now, I could continue, there were other people who, on an informal basis we solicited their opinions, but these were the principles, as I recall, involved in

picking this location.

Q. You were primarily geologist?

A. That's correct.

Q. And the plats that we have before us are geological presentations that you prepared?

A. Yes, sir.

Q. When was this done? When did you get together as a group and decide on this location?

A. I believe it was -- well, of course, it was in the spring we were talking about it because we were discussing, "Well, gee, we have a mechanical failure in the NIBU No. 5." However, of course, Marathon, a major oil company, takes a while to get things decided on with all these people and fortunately for us, very fortunately for us, in that time frame these Santa Fe Exploration Company people came in and showed us that that very line poor resevoir has to be shifted somewhat to the east of where we thought it was.

So then we went ahead and remodified our maps again. Of course, for this hearing we have done a lot of pretty art work. This is a a very similar map that was created in the month of October 1989. I'm talking about Exhibit 2, just to help the Examiner see where that line is.

Obviously, the structure map in Exhibit

No. 1 was prepared in October 1989. It is a blowup of an entire field structure map that we presented -- we present every time we ask for some money out here.

Finally, the cross-section that you see, Northwest of Southeast, was presented in September 1989 as technical evidence to tell our management irrefutably, "We have to move a little south."

Q. My question is, basically, was this decision made to pick this particular location after the Santa Fe Exploration Well was drilled and you had information on that well?

A. Yes, sir.

Q. And so you knew when you picked this location to the south the information available on that well?

A. Yes, sir. Yes, sir, we did. Specifically because of the stratigraphic and production or, if you will, DST and lack of production information that we saw in the Santa Fe Exploration Company well.

Q. All right. Let's go to your Exhibit No. 2. This is an exhibit that was also prepared in October of 1989; isn't that correct?

A. This exhibit was revised in October 1989.

Q. And it was prepared for this hearing; isn't that fair to say?

A. Yes, sir, that is correct.

Q. I think what I would like to ask you to do, Mr. Carlson, if I could, I would like to mark the application that was filed with the Division seeking an administrative approval for this well location as Oryx Exhibit A and ask you to look at that, please.

A. Okay.

Q. If we look at this exhibit, on the first page it indicates that -- at the end of the first paragraph that, "Geological conditions dictate the selection of the unorthodox well location"; correct?

A. Let me just read -- would you please repeat your question?

Q. I don't even think we need to repeat it.

A. I was starting to read. I'm sorry.

Q. This was the application that was filed. Have you seen this application before?

A. Yes, sir.

Q. The last sentence of the first paragraph in the letter reads, "Geological conditions dictate the selection of this unorthodox well location"; that's correct, isn't it?

A. That's correct.

Q. If we go to the second page of this -- do you know who prepared this particular summary?

A. Yes, sir. I actually prepared this and typed it myself.

Q. If we go to the next page in the exhibit, I believe this is the same cross-section, is it not, that has been presented here today?

A. This is a previous revision of this cross-section, yes. Previous version.

Q. And this is the cross-section that you presented to your supervisors or to the rest of your team to confirm or convince them you had to have a location as you proposed?

A. Yes, sir.

Q. And that's dated September 1989?

A. Yes. You'll see it's in minature. We blew this up to make the exhibit for the commission.

Q. Now, if we go for the next exhibit, this is a Top Upper Penn Structure Map.

Is this the same zone that is depicted on your Exhibit No. 1? Top Upper Penn Structure Map?

A. Yes, sir.

Q. Now, if we look at this structure map, this is also a September, 1989 presentation, is it not?

A. Yes, sir, that's correct. However, it should be said, that this map is a map showing acreage and whatnot -- acreage and locations of wells,

whatnot, structure, for presentation to our management and the original purpose of this map and of this revision was for showing the field to the management during a budget presentation. And some of the things we might do.

Q. Now, if we look at the structure map and the exhibit we have marked as Oryx Exhibit A, there is a line that runs across Section 9, that if I look at the Code says limit of the --

A. Limit of dolomitization is what the line says.

Q. Dolomitization, yes. That runs right through the Santa Fe well in the Southeast of the Southeast of Section 8; isn't that correct?

A. That is correct. Well, of course, it's kind of a small scale.

Q. But it's basically through that well?

A. That's right. It's through that well.

Q. And if we go due north to the No. 4 well, to the well in Section 4, due north, you've got your limit of the dolomite running right through that well; isn't that right?

A. That's correct.

Q. Now, if we compare that to the limit of dolomite that you have put on the exhibit you've

prepared for the hearing, in fact, what you've done is moved the dolomite limit a couple of hundred feet --

A. Right.

Q. -- to the east, have you not?

A. Yes. Would you like to know why?

Q. Was there any additional information available?

A. Yes, sir, there was. There was additional information.

Q. And what was that?

A. That additional information came from Section 18, Township 21 South, Range 23 East. We secured the logs from the well that is drilled in the unorthodox location in the east corner of the southeast corner of Section 18. We looked at that log and we found that it was 100 percent limestone. So what that told us is that rather than the optimistic picture which I show on page 3 of Oryx's Exhibit No. 1 , in which I just drew the edge of the reservoir to the, basically, poor wells, depleted to the nonreservoir wells -- what I did for this close-up, which, of course, is at a much larger scale and a much more technical major than what we show our management just to approve some plans, is a more exact realization.

Q. Just to be sure I understand, when you got the log information on the unorthodox location in the Southeast of the Southeast of 18, that was limestone and you didn't find porosity within the dolomite?

A. No. We didn't find dolomite. We found porosity. In fact, we found enough porosity, as did the operator, that they were even going to make a 24 million cubic feet a day well there.

Q. That was from porosity within the dolomite?

A. No, sir. That was porosity within the limestone.

Q. And that is the one bit of evidence that you have utilized for bringing your line over? Anything else new?

A. No, sir. I would say that's the evidence. Once again, though, the cross-section shows that the well in Section 8, the southeast corner of the southeast corner is clearly a limestone and that there isn't even a hint of dolomite there.

Q. In which well was that? I'm sorry.

A. That's the Santa Fe Exploration No. 1. The cross-section, Exhibit 3, shows there wasn't even a hint of dolomite in that well.

Now, we normally think of stratigraphic occurrences occurring over a short distance or a short

space and we associate uncertainty with stratigraphic boundaries. One of the reasons I used crosshatch that's a quarter-inch wide on the display in Section 2 is because I can't tell you exactly where that lies. I can tell my management that the well in Section 4 and Section 8 are nonproductive and they're a limit to the reservoir on a scale of 1 to 8,000 feet, which you see on your exhibit.

I can tell you, technical people here today, that we feel the evidence suggests that that lime to dolomite transition is somewhat southeast of the Santa Fe well in Section 8. We could still hit it, and if we do, we better be as lucky as that operator in Section 18 that still made a well out of limestone. But, by golly, we're going to try and miss it if we can.

Q. And so by moving to the proposed location, you're reducing that risk?

A. We're reducing stratigraphic risk.

Q. You stated, and correct me if I'm wrong, that in the Santa Fe well in the southeast of the southeast, there wasn't a hint of dolomite?

A. No, sir. You can take a very careful look at the section here, and once again this is a modern 1989 log. It is a density neutron log fixed on a line

matrix, which means, where it shows lime, it does exactly what you would expect it do. If you look at the scale at the bottom, both curves are reading within the acceptable error for these curves right at zero, zero porosity, 100 percent line.

Q. I just want to be sure I understood your answer. You stated that in the well in the southeast of the southeast there wasn't a hint of dolomite and you said, "Yes, sir." I don't know, did that mean there was or there was no dolomite?

A. For the record, I have not observed dolomite in the Santa Fe No. 1 Well, Exploration No. 1 Well.

Q. Do you have to have dolomite to have a well on the reservoir?

A. No, sir. Very clearly you do not have to have dolomite to have a well in the reservoir. For instance, if you would like, I will show you again in Section 18, this particular operator in Section 18 was very fortunate in that he was very close to dolomite but, once again, this log showed limestone. The dolomite reservoir is a fractured reservoir, apparently the fractures extend just a little ways into the limestone; you can tap it.

However, our experience in Section 4 shows

that as soon you as get away from that transition of facies, you get a sub-economic well. It will still produce, and there's plenty of places where a half bcf well are very good, but, remember, here's the well away from the transition in Section 16 that made 28 -- yes -- 28 bcf. Here's the well in Section 9, of course, NABU No. 5 that has made 22 bcf. There is a tremendous -- we're talking two orders of magnitude difference in production across at that line.

Q. Now, I believe you indicated that you're proposed location was a standard setback from the boundary of the unit in which it is located?

A. That's correct.

Q. This unit is also within the Indian Basin Field, is it not?

A. Yes, sir. It is the north Indian Basin Unit producing from the Upper Penn dolomite reservoir.

Q. And those pools rules do require 1650 foot setbacks from the boundary and spacing and proration units, isn't that right?

A. I believe that a careful examination of the unit agreement that was approved and the legal ramifications of that would be needed to answer that question.

Q. Now the well location --

A. So I'm not agreeing with you.

Q. Are you disagreeing, or do you not know?

A. I'm rendering no opinion because I have not recently thumbed through that particular -- I have other friends in Marathon.

Q. If this well had been located 1650 from the south and the west lines of Section 9, it would, in fact, be farther from Section 17, would it not, than it is now?

A. Would you please show me what you mean on a map.

Q. Could you place on the map the closest standard location that would be a 1650 setback from the south and west lines of Section 9?

A. Yes, I could do that. You would be up across -- you would be 1650, sure.

Q. You would be farther from Section 17, wouldn't you? By going north?

A. I would be further from Section 17, however, significantly, the northeast corner of Section 17 we deem to be not prospective from an economic point of view because of the well drilled so close to the lease line in the southeast corner of Section 8. We believe that between Section 9, we believe that in a direct line between our producing

well in Section 9 and Oryx's wells in Section 17 there is nonprospective rock.

Q. And if you're interpretation is in error as to the exact placement of the dolomite, we wouldn't have this restriction in the northeast; isn't that right? It's your interpretation of that location?

A. It isn't truly a geologic interpretation.

Q. And there are a number of factors that have been employed to pick the particular location for this well; isn't that right?

A. That's correct.

Q. And the bottom line result is, however, it is closer to 17 than if it were back at a standard location, 1650 from the south line?

A. Right. If you look at the surface of the earth --

MR. CARR: That's all I have. Thank you.

THE WITNESS: However, it's important to know -- okay.

EXAMINATION

BY HEARING EXAMINER:

Q. Mr. Carlson, you testified that your No. 5 well was producing water?

A. Yes, sir.

Q. The well is more than a mile from your

water/gas contact; isn't that right?

A. That is correct, sir.

Q. And it's approximately 200 feet structurally above that contact?

A. That's correct.

Q. I think you also testified that you attempted to swab the well and you were not able to get down?

A. This is what I've been told by our engineering department.

Q. And you perceive this to be a mechanical problem in the well?

A. Mr. Lyons, the evidence for it being a mechanical problem is that we have a producer in Section 10 to the east that is still making 1.8 million cubic feet a day. The other evidence is if you look at your cross-section again, Exhibit 3, you will see that the thickness of the formation is greater than 200 feet. Therefore, there is some water below the perforations in Section 9.

Q. Right.

A. So we feel that we have a mechanical problem. We have some sort of water coming up from deeper than our perforations in our well in Section 9.

Q. And how far beyond the well bore of the

well would you think that that mechanical condition persists?

A. Well, we associate mechanical conditions with the well bore and, perhaps, invade zone, so maybe a foot or two, sir.

Q. So it really isn't essential that you move that far away from that well if you're going to replace it?

A. That's correct. It's not essential to replace the well strictly if we want to get today's production rate from that well -- or what it would have been without the water. However, of course, we're interested in conservation and all these other things we mentioned here, certainly, in drainage, effectively, of all of Section 9. So as long as we're going to drill a new well, we feel we should drill the most economically viable well.

Q. At a location which would have the effect of recovering as much of your gas as possible?

A. That's correct, sir.

HEARING EXAMINER: That's all I have. Do you have any questions?

MR. STOVALL: No. No questions.

HEARING EXAMINER: Do you have anything further?

MR. KELLAHIN: No, sir.

HEARING EXAMINER: Any more questions of Mr. Carlson?

All right. You may be excused.

MR. KELLAHIN: That concludes my presentation at this time.

HEARING EXAMINER: Mr. Carr.

MR. CARR: At this time, Mr. Examiner, I would call David Rojas.

DIRECT EXAMINATION

BY MR. CARR:

Q. Will you state your full name for record, please.

A. Yes. My name is David Rojas.

Q. Mr. Rojas, by whom are you employed and in what capacity?

A. I'm employed by Oryx Energy Company, and I'm a staff geologist.

Q. Have you previously testified before the Oil Conservation Division and had your credentials as a petroleum geologist 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 Marathon Oil Company?

A. I am.

Q. Have you made a study of the subject area in preparation for today's hearing?

A. Yes, I have.

MR. CARR: Are the witness's qualifications acceptable?

HEARING EXAMINER: Yes, they are.

Q. (BY MR. CARR) Mr. Rojas, would you briefly state what Orxy seeks with this application.

A. Oryx would like to see that Marathon's application for an unorthodox location be denied. And in the event that the commission should see fit to grant an unorthodox location, we would like to see an imposition of a penalty based on the well's ability to produce.

Q. Would you refer to what has been marked for identification as Oryx Exhibit 1 and identify this and review the information on this exhibit for the examiner.

A. Yes. This Exhibit No. 1 is a working interest owner plat which covers a 25-section area in the northwest portion of the Indian Basin field. The working interest owners are shown in red with their designated amount of working interest to the right of the working interest owners for that section.

Q. What is the status of the working interest in sections -- I believe they are 5 and 8 on this exhibit where they are not indicated?

A. Yes. I just recently received this information. In Section 5 the working interest owners is Alma Joe Canter, and they have 100 percent working interest. And in Section 8 there is 120 acres that are unleased, 400 acres which expired today, actually, and there is a 40-acre tract, being the Southwest 1/4 of the Northwest 1/4 of Section 8, which is 100 percent BHP. It is an HBP, or held by production lease.

The remaining 80 acres I have not referred to yet is the East 1/2 of the Southwest 1/4 of Section 8. This 80 acres is held by production in a lease which is in conjunction with the lease in Section 17, operated by Oryx. Therefore, the represented working interest percentages in Section 17 basically convey to the East 1/2 of the Southwest 1/4 of Section 8.

Q. And then in Section 17 Oryx has 54.1 percent of working interest; is that right?

A. Of the working interest.

Q. Is the royalty interest indicated on this exhibit?

A. Yes, it is. The royalty interest is shown in this exhibit in green at the base of each section. As you can see, the U.S. is represented for federal leases and the State is represented for state leases. You can see, for example, in Section 9 where the proposed location lies, that this is a federal lease. Then if you move south from Marathon's proposed unorthodox location in that section, you encroach upon a state tract, that being Section 16.

I would like to also add in reference to our working interest we just discussed that Oryx maintains a working interest, not only in Section 17, but in Sections 18, 20, 21, and also in all four of these sections, Oryx maintains a producing gas well from the Upper Penn carbonate or Upper Penn pool.

Q. And you've heard the testimony here concerning the special pool rules in effect for this pool. What exactly is the spacing setback requirement as set forth in the pool rules?

A. As set forth in the pool rules, the rules require a 640-acre spacing unit, and they do say that there is a 1650 foot setback from the outer boundary of the spacing unit.

Q. Is this the rule that represents the basis for the Oryx objection at today's hearing?

A. Yes, it is.

Q. Could you identify what has been marked as Oryx Exhibit No. 2 and review this for the Examiner.

A. Yes. This is a structure map on top of the Upper Pennsylvanian formation. It has a similar area to Exhibit No. 1. It shows the subsea top that I have used to map the top of the Upper Penn. This subsea top is represented in red to the left of each well symbol. This map, if you compare it to the new generation or the exhibit presented at this hearing as Marathon' structural exhibit, you can see that they are basic agreement as far as the general structural elements present, with the exception of a structural nose proceeding from the southwest to the northeast, which proceeds through the Northwest 1/4 of Section 9.

Q. What is the orange box in the center of Section 9?

A. The orange box represents an area within which any well drilled would be a legal or a standard location. The green circle shown in the southwest corner of that box is a location which would be at 1650 feet from south and west lines.

The pink line, which I have shown which proceeds from that green location southeastwardly to another pink location, this line represents an area

which -- or a line of potential locations which would be equidistant from the distance of Oryx's nearest upper Pensylvanian producing well, that being the West Indian Basin Unit No. 1 well referred to earlier in Section 17 in the Southeast 1/4 of the Southwest 1/4.

The footage distance from that well, the West Indian Basin No. 1 well to the orthodox location, being the green dot I just spoke of, is approximately 8,000 feet. Any well that would be drilled on the pink line proceeding southeastwardly from that green location would be a distance of 8,000 feet from the Oryx well.

Q. Now, Mr. Rojas, are you recommending any location whatsoever?

A. I am not recommending any specific location.

Q. Would you identify what has been marked as Oryx Exhibit No. 3 and review this please.

A. Exhibit No. 3 is a net porosity isopach of the Upper Pennsylvanian section. This isopach was constructed using a porosity cutoff of 5 percent porosity. And the contours are at 25-foot intervals. The amount of footage of the porosity greater than 5 percent is represented, again, to the left of each well bore symbol in red.

I would like to point out that, if you look in Section 9, you will see that I have shown there is 102 feet of porosity development in the current existing well bore.

Q. Anything else further with Exhibit No. 3?

A. I would like to say that this 102 feet of porosity development that I show in Section 9 concludes and confirms the fact that you are a substantial distance away from the facies pinch out which both parties have both described.

Q. Would you now identify Oryx Exhibit No. 4.

A. Exhibit No. 4 is a production plat, again, covers the same aerial extent that the previous three exhibits have covered. The production represented on this plat is strictly from the Upper Pennsylvanian pool. And there is a legend which shows how each of the production figures -- what it represents.

I'll run -- quickly across the top is, in thousand cubic feet of gas, the current production of gas. Then to the right of that is the current barrels of condensate per day, and further to the right would be the barrels of water per day. And below that would be the cumulative figures of billion cubic feet of the gas, 1,000 barrels of condensate and 1,000 barrels of water.

Q. Mr. Rojas, what conclusions have you reached from your study of this area?

A. My conclusions would be that, basically, I agree with Marathon, and as represented in my Exhibit No. 2, that there is a facies boundary, a limestone-dolomite facies boundary, that is present to the west of the current well in Section 9. However, as both exhibits do show and as I believe I have emphasized, there is a substantial difference, or a substantial distance from the well, the current well in Section 9 to this facies pinch out.

Q. In your opinion, are there standard locations available in Section 9 from which the reserves in this section could be produced?

A. Yes. Again, if you look at both Exhibits No. 2 and 3 simultaneously, you can see that structurally there are orthodox locations within my orange designated aerial of standard or legal setback locations, which would be structurally updip, not only to the current well in Section 9 but to the proposed unorthodox location which Marathon has presented.

Also, it shows, if you look at Exhibit No. 3, at the isopach of porosity, that there is sufficient amount of porosity in these orthodox locations equal to the amount of porosity that is

shown in the existing well bore.

Q. Will Oryx also call an engineering witness?

A. Yes, they will.

Q. Were Exhibits 1 through 4 prepared by you or compiled under your direction and supervision?

A. Yes, they were.

MR. CARR: At this time, Mr. Examiner, I move the admission of Oryx Exhibits 1 through 4.

HEARING EXAMINER: Is there objection?

MR. KELLAHIN: No objection.

HEARING EXAMINER: Exhibits 1 through 4 will be admitted.

MR. CARR: I have nothing further on direct.

HEARING EXAMINER: Mr. Kellahin.

MR. KELLAHIN: Thank you, Mr. Examiner.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Rojas, let's see if we can do some comparisons.

A. I will need the updated Marathon structures.

Q. Do you have a set of the Marathon exhibits?

Let me give you an extra set so that we share these together.

A. Thank you.

Q. Let's compare your structure map, which is your Exhibit No. 2, to Mr. Carlson's structure map, his Exhibit No. 1.

A. Okay.

Q. Let me ask you about your structure map, Mr. Rojas. Is this a structural interpretation of the area that you have taken from Oryx's files and utilized, or is this a structure map that you have generated entirely of your own interpretation of the data?

A. I have generated this map entirely on my own as an accumulation of the data.

Q. Did you have file copies of structure maps that existed for any of the properties that Oryx had an interest in in Section 17?

A. The well in Section 17 and the well in Section 18 were purchased by Oryx from, I believe Enfield --

Q. Yes, Robert Enfield.

A. -- in 1988. And I did not have any maps to go by.

Q. And you didn't have any existing Oryx maps then for this particular area that showed someone else's structural interpretation within the company?

A. No.

Q. So you started from scratch?

A. I did.

Q. When did you commence your work?

A. I commenced my work at producing a structure map in, I believe it was February of this year, of 1989.

Q. Why did you commence doing it at that point?

A. At that point we were looking at the development of the Indian Basin Field, due to its high productivity, and we were very concerned with the wells which we now maintain an interest in and how it had been developed.

I might add that I have updated this map, as Mr. Carlson has suggested he had done his, after I recovered the data of the Santa Fe well in the Southeast 1/4 of the Southeast 1/4 of Section 8. However, it did not drastically influence my structure.

Q. You had the opportunity to examine Mr. Carlson's earlier depiction of the structure that he submitted with his application?

A. Yes, I did.

Q. And you have reviewed his subsequent

modification of that display which integrated the Santa Fe Exploration well in the Southeast of the Southeast of 8?

A. I have. Although I see no subsea datum used to do this map.

Q. Let's start off with the fault in the southwest corner of each display. There is a difference between you two geologists as to how you have specifically located that fault in the east-west dimension. You both have it running in the same general northwest southeast direction, but there is a difference in where you located it?

A. That is correct.

Q. There is a several hundred foot distance in where that feature is depicted on each interpretation, is there not?

A. I see a structural displacement but not a displacement between any wells. All of the wells he has on the upthrown side I have, and all the wells he has on the downthrown I have on the downthrown.

Q. When we look at the eastern edge of the feature Mr. Carlson has testified concerning the original gas/water contact, have you made a study to determine whether the original gas/water contact is?

A. I have not made a study as to the location

of the gas wate contact, no.

Q. Either the original contact or where that contact may be now?

A. I have not, no.

Q. When we look at the limestone dolomite facies change that you have shown in the florescent pink color to the north and west, you've said that's limestone; to the east, it's dolomite. There is a significant difference between you two gentlemen about where you've put that, isn't there?

A. I don't see a significant difference in the proximity of Section 9.

Q. Well, let's start off in Section 18.

A. Okay. Two miles away.

Q. Yes, sir. When we compare Exhibit No. 2, Mr. Carlson's Exhibit No. 2, with your Exhibit No. 2 --

A. Yes, sir.

Q. -- he has shown his limits of the reservoir being north and west of the two wells in Section 18. Yet he shows the lime-dolomite facies change just to the south and east of the nearest well to the Oryx property in 17?

A. That's correct.

Q. That's -- I apologize for not knowing the name of that well --

A. Burnell Federal Well, isn't it?

Q. It's the Burnell Federal Well, isn't it?

A. Yes, sir.

Q. He's got that in the lime, right at the facies change. Yet when we look at your display and your pick of the lime-dolomite facies change, you've got both wells in 18 in the dolomite?

A. That is correct. I have -- yes.

Q. And as we go up, follow your dolomite line, we get up to the Santa Fe Exploration Well in the southeast corner of 8, you've taken that facies change closer to the well bore than Mr. Carlson has. Do you see? There is a difference.

A. Yes, I see.

Q. Your line is farther west at that point, and his line is farther east.

A. That is correct.

Q. There is a difference. When we get up to Section 4, you have got the dolomite facies change to the west of the well in 4, and he's got it to the east.

A. Yes. I don't understand that either, because I have reviewed the well in Section 4, and using the same cutoff that Mr. Carlson has suggested using as determing a cutoff for dolomite or limestone

on a density log, that log shows me that there is substantial amount of dolomite. However, there is limestone present and that is why I have located the limestone dolomite facies in close proximity for the well in Section 4.

Q. In addition, in drawing the contour lines on the structure you have interpreted a nose in Section 9 that Mr. Carlson doesn't interpret.

A. And, again, I do not understand, based on my interpretation of the data, I can see a vast difference of Mr. Carlson's structure map, and may I reference the well in the southwest -- excuse me -- in the northwest quarter of the southeast quarter, the only well in Section 7. According to Mr. Carlson's map he has that well approximately 150 feet updip to the Santa Fe well in the southeast 1/4 of the Southeast 1/4 of Section 8. I don't see any reference to the subsea map, however, as you will see in my Exhibit No. 2, I show that these wells are very close to being structurally along strike. This, and along with the additional information of the other two wells in Section 8, has caused me to draw a nose, as I indicated further, trending from the southwest to the northeast, and --

Q. Let me short-circuit this directly in

Section 9. Without your interpretation of the nosing feature in Section 9, your location of those structure lines is going to be very similar to what Mr. Carlson has done for his structure map; is that not true?

A. That would be creating a structure map with very localized -- a couple of wells of information. I would rather see a regional picture.

Q. I understand. But that nosing feature in 9 is the difference that separates your structure map from Mr. Carlson's as we look in Section 9?

A. The nosing feature and the orientation of the structural dip, both are different.

Q. I'm going to propose too, Mr. Rojas, that despite the differences that we have just highlighted, that both you and Mr. Carlson agree on two of the fundmental geologic points.

First, it appears to me that you agree with Mr. Carlson that the unorthodox location is going to gain structure over the existing No. 5 well in Section 9, under either interpretation; is that not true?

A. I agree.

Q. And that between the closest standard location, 1650 out of the west and 1650 out of the south of Section 9, that under either geologic

interpretation the unorthodox location that Marathon proposes moves farther away from the facies change?

A. Marathon's proposed unorthodox location is further away from the facies change?

Q. Of the limestone-dolomite under either interpretation?

A. As depicted, by either interpretation, yes.

MR. KELLAHIN: No further questions.

THE EXAMINER: Mr. Carr?

MR. CARR: No questions.

EXAMINATION

BY HEARING EXAMINER:

Q. Mr. Rojas, I understood that you did not have a recommended location?

A. Oryx has, in communication with Marathon, indicated that they have no objection to any location that Marathon may come up with that would be located along that pink line that we discussed earlier in Exhibit No. 2, which proceeds southeasterly from the standard location 1650, 1650 from the south and west lines. Oryx has no objection to any well drilled along that line or to the northeast of that line.

Q. I see that there is a "S" only that location. That is a locus of points at which you would have no objection, is that right, anywhere on

that pink line?

A. That's correct. That pink line being, for the purpose of describing a little more because of the small scale that we have used here, being anywhere equidistant from the West Indian Basin Unit No. 1, that being 8,000 feet.

Q. You probably testified to that, and I wasn't listening that close. I just happened to see that pink line.

A. That's okay.

HEARING EXAMINER: I think that's all the questions I have.

MR. STOVALL: I have a question with regard to the pink line.

THE WITNESS: Yes.

EXAMINATION

BY MR. STOVALL:

Q. How come you picked a line which is equidistant from your well -- getting back down into the Southwest 1/4 of Section 17, rather than a line that is equidistant from the corner of the Oryx Section 17?

A. That's something that might be addressed better by the reservoir engineer. However, I will give my geologic interpretation of that pick being

that we are concerned with the drainage which would occur as in relation to our current nearest well bore.

Does that answer your question?

Q. It would appear to me then it would probably be preferable from Oryx's standpoint, again. I'll ask you as a geologist and then I'll pick on the engineer, too --

A. I don't consider you picking on me, sir.

Q. I'm glad you don't, because I said that humorously.

You'd actually be preferable -- the further to the southeast you go on that line it's actually better for Oryx, because you're getting further away from the Oryx property, is that not correct, than a standard location? Than the most southwest location?

A. You are, additionally, getting distance from the Oryx Section 17; that's correct. That was not the purpose for delineating that pink line. It was merely the distance from the current producing well bore. Again, I guess I'm not answering your question.

Q. Well, I'll wait until the engineer -- you've told me the engineer is one that has a better answer to that question?

A. Yes.

Q. I'll wait until she's on.

A. It was not a geological pick as to its location.

MR. STOVALL: Okay. That's fine.

HEARING EXAMINER: Any further questions of the witness?

MR. KELLAHIN: Let me pursue the pink line that's come up in response to your questions, Mr. Lyon.

RECROSS EXAMINATION

BY MR. KELLAHIN:

Q. And I think your last comment, Mr. Rojas, clarifies it for me, but am I correct in looking at Exhibit No. 2, that from looking at a structural position, there is no explanation for the location of the pink line based upon structure?

A. That is correct.

Q. When we look at your thickness map, there is no geologic basis in determining thickness to the location of the pink line?

A. That is correct.

Q. So the only judgment for determining where you would have no objection to Marathon locating its well in Section 9 is simply to maintain the 8,000-foot distance between the Oryx operated No. 1 well in 17

and what would have been the closest standard location out of the southwest corner of Section 9?

A. Not completely true.

Q. Okay.

A. Let me state that Oryx has no opposition to Marathon drilling their well anywhere beyond that 8,000 feet. As I said in my testimony, a legal standard location could be attained structurally updip and with thicker porosity development than the proposed unorthodox location.

Q. But there is no geologic justification for the location of the pink line, as shown on the display?

A. No. I'm sorry. I didn't mean to --

MR. KELLAHIN: No further questions.

HEARING EXAMINER: The witness may be excused.

THE WITNESS: Thank you.

MR. CARR: At this time I would call Bonnie Wilson.

(Thereupon, a recess was held.)

HEARING EXAMINER: Would you like to proceed, Mr. Carr.

MR. CARR: Thank you, Mr. Lyon.

DIRECT EXAMINATION

BY MR. CARR:

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

A. Bonnie Sue Wilson.

Q. Ms. Wilson, by whom are you employed and in what capacity?

A. Oryx Energy as a reservoir engineer.

Q. Have you previously testified before the Oil Conservation Division.

A. No, I haven't.

Q. Would you briefly summarize your educational background and then review your work experience.

A. I graduated from Texas A&M University with a B.S. in engineering in 1980. I've worked since then for Oryx Energy as a reservoir engineer for nine years. And I've worked in Eddy County, New Mexico, for the past year.

Q. Are you familiar with the application filed in this case on behalf of Marathon Oil Company?

A. Yes, I am.

Q. Are you familiar with the Indian Basin Upper Pennsylvanian gas pool?

A. Yes.

MR. CARR: We tender Ms. Wilson as an

expert witness in petroleum engineering.

HEARING EXAMINER: Ms. Wilson is qualified.

Q. (BY MR. CARR) Have you prepared certain Exhibits for presentation here today?

A. Yes, I have.

Q. Would you identify what has been marked as Oryx Exhibit No. 5, explain what this is and review it for the Examiner.

A. This is a 25-section plat. What I have posted beside each well is the cumulative gas production. It's shown in green. And then I contoured these cumulatives to show the prolific production in the field. The contour interval is 10 bcf. You can see some wells up to -- or have produced up to 30 bcf. The well in Section 9 has cumed to date 23 bcf, and the well in Section 18 has cumed 5 bcf, and the second well there, the No. 2, has cumed 2 bcf.

Q. Let's move now to Exhibit No. 6. Would you identify this please.

A. This is a P over Z curve. On the Y axis I have plotted the pressure divided by compressibility factor. And then on the X axis, the cumulative production at the date the pressure measurement was taken, as plotted. There is a linear function between the P over Z and the cumulative production

extrapolation of this linear function to an abandonment pressure would yield a cumulative or an ultimate recovery from a well.

From the North Indian Basin No. 5, assuming that well had no mechanical failures, it would ultimately cume 40 bcf.

Q. And did you have an opinion as to whether or not the unorthodox location is necessary to recover the additional reserves that are under this tract as depicted on the P over Z curve?

A. A well at or near this location would recover the remaining 17 bcf shown on this curve.

Q. When you say this location, do you mean the original well location?

A. The existing location for the North Indian Basin No. 5.

Q. Would you now identify what has been marked as Oryx Exhibit No. 7, which is Oil Conservation Division Order R-8913.

A. This is an order that approved Santa Fe Exploration Company's unorthodox well location in the Southeast 1/4 Southeast 1/4 of Section 8.

Q. And Section 8 is a tract in which Oryx owns a working interest; is that right?

A. Yes.

Q. Did this order provide for a penalty based on the well location?

A. Yes, it did. As you can see in Finding No. 11, there was a voluntary agreement reached between Marathon Oil and Santa Fe Exploration as to a production penalty to be assessed against the well.

And in finding No. 12, that penalty was to be 60 percent, and it was based on the east-west variance from a standard location.

Q. Ms. Wilson, is the Indian Basin Upper Pennsylvanian gas pool a prorated gas pool?

A. Yes, it is.

Q. And how was the penalty applied in the Santa Fe Exploration order?

A. Well, referring to Order paragraph No. 16, the penalty was imposed on the acreage factor in the production formula. Since the penalty assessed was 60 percent, therefore, the acreage factor was reduced by 60 percent. The acreage factor would have been 1.0 had no penalty been assessed, but this was reduced by 60 percent to the 0.4 acreage factor shown in the order.

Q. Do you recommend that a penalty be imposed upon the proposed Marathon well because of its location?

A. Well, first, I would recommend that marathon's request for an unorthodox location be denied because there are several standard locations that they could drill at to economically recover the reserves underneath their section. However, in the event that an unorthodox location is approved, a penalty should be assessed.

Q. Would you identify Exhibit No. 8, please.

A. Exhibit No. 8 is a plat and formula which shows how a penalty will be calculated. It shows the unorthodox location proposed by Marathon and its setbacks, and it also shows the Santa Fe well and its setbacks.

Q. And then at the bottom of this exhibit is the method for obtaining the recommended penalty?

A. Yes.

Q. Would you review that for the Examiner, please.

A. Okay. I'll read the formula. The sum of the east-west variance and the north-south variance divided by the sum of the standard setbacks would equal the penalty.

Substituting numbers into this formula, in the east-west direction there is no variance. Therefore, a 0 is entered into the formula.

However, in the north-south direction, drilling 330 feet from the south line would result in a variance from a legal setback of 1650, of a variance of 1320 feet.

So 1320 is entered into the formula. And then the two legal setbacks, 1650, are entered into the formula, resulting in a penalty of .4.

Q. Would you now go to Exhibit No. 9 and show how that relates to the allowable formula for the well?

A. The top formula in this exhibit is simply the formula we just went through showing the penalty of .4. Then the bottom equation is the formula showing how that penalty would be assessed against the acreage factor. The acreage factor would be multiplied by 1 minus the penalty to equal a reduced acreage factor. In the case of the Section 9 well, it has a current acreage factor of 1.0 that multiplied by 1 minus the penalty of .4 would yield a reduced acreage factor of .6.

Q. Ms. Wilson, I would like to direct your attention to what has been admitted as Marathon Exhibit No. 2, if you would?

A. Yes, sir.

Q. If I understood your testimony from your

Exhibit No. 5, the well that provided the new information, according to Mr. Carlson's testimony for moving the dolomite line, was the well at the unorthodox location in the Southeast 1/4 of section -- I believe it's -- I can't read it on your exhibit. It's Section 15, I believe, or 16?

A. The Burnell No. 1 or the Burnell No. 2?

Q. The one at the unorthodox location, the No. 2.

A. Burnell No. 2, yes.

Q. And you have a production figure of 2 bcf on that well?

A. Yes, sir.

Q. Is that the cumulative production figure to date?

A. Yes, sir.

Q. Is that well still producing?

A. Yes, sir, it is.

Q. Would you recommend to your management to drill a well for 2 bcf?

A. Yes, sir, I would.

Q. Let's go to the Burnell No, 1, the well at the standard location in that section.

A. Yes, sir.

Q. You have a 5 bcf figure on that well?

A. Yes, sir.

Q. Is that the production or is that well still producing?

A. That is that well's ultimate recovery. It is no longer producing.

Q. Would you recommend to your management that you drill a will for 5 bcf if they asked?

A. Yes, sir, I would.

Q. Would you summarize the recommendations that you're here to make on behalf of your company to the Examiner?

A. Well, I would recommend that Marathon's application for an unorthodox location be denied. There are many standard locations they can drill to recover the reserves underneath their section.

However, in the event that the application is accepted and the unorthodox location is allowed, then a penalty must be assessed.

Q. In your opinion, if the application is denied and Marathon develops at a standard location would the correlative rights of Oryx be protected in Section 17?

A. Yes.

Q. If the application is granted and the penalty you recommend imposed would the correlative

rights of Oryx also be protected in 17?

A. Yes.

Q. Were Exhibits 5 through 9 prepared by you or complied under your direction?

A. Yes.

MR. CARR: At this time, Mr. Lyon, I move the admission of Oryx Exhibits 5 through 9.

HEARING EXAMINER: Is there objection?

MR. KELLAHIN. No objection.

HEARING EXAMINER: Exhibits 5 through 9 will be admitted.

MR. CARR: That concludes my direct of Ms. Wilson.

HEARING EXAMINER: Mr. Kellahin.

MR. KELLAHIN: Thank you, Mr. Examiner.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Ms. Wilson, let's take a couple of your dispays and maybe you can help me understand what you are proposing. Let's first of all take the Santa Fe Exploration order, which is Exhibit 7, and turn to page 3, and look with me at Finding No. 12.

Is it your understanding that in calculating the penalty formula for this well, that Santa Fe had proposed, which was 660 from the east

line and from the south line of their spacing unit, that the Division used the east-west variance only in coming up with the penalty?

A. I did not know whether or not they used the east-west only, or whether or not they used both setbacks, since both setbacks would have basically given you the same factor they had listed here, 1990 divided by 1650.

Q. Well, look at the language of 12. It says, "The proposed 60 percent production penalty is based upon the proposed well location's east-west variance from a standard well location or 990/1650."

A. Yes, I see. And it appears that, yes, they were basing it on only on an east-west variance.

Q. If they had wanted to include the north-south factor, I would assume they would have said and the north-south variance, right?

A. Yes, sir.

Q. Let's look at your Exhibit No. 8. Take your formula for me. 0 plus 1320 over 1650 plus 1650, you see -- obviously you know that one?

A. Yes.

Q. If Marathon was to drill a 660 location out of the corner of Section 9, move 1,000 feet closer to 8, come right out of the corner, a corner shot, would

you plug that into your formula and tell me what that penalty would be?

A. That formula is written, actually on this exhibit. It was actually the Santa Fe formula that I used. The two setbacks would be 990 plus 990 divided by 1650 plus 1650, and that would result in a higher penalty of 60 percent.

Q. I don't have the number here. You've got 990. I'm looking at 660. 660 is the encroachment?

A. 660 is the encroachment, but I'm using the variance. In the formula it uses the variance. And the variance from the setback, if the well is 660 from the line, then its variance from a legal location would be 990.

Q. So I can go 660 out of corner and only suffer a 20 percent greater penalty than your proposing if I am at the 1650, 330 location?

A. Let me think through what you said.

Q. Sure. Look at the 990, 990. That's a 60 percent penalty.

A. Yes.

Q. Compare that to the 40 percent penalty.

A. Yes.

Q. I can go to a closer unorthodox location, 660 out of that corner and only cost me another 20

percent.

A. That is true.

Q. Would you look at finding No. 16 for me on page 3 of the Order 8913?

A. Yes, sir.

Q. It says, "No other offset operator objected to the proposed unorthodox gas well location."

A. Yes, sir.

Q. Oryx didn't object, did they?

A. No, sir. We phoned Marathon and asked them if they were objecting, and they told us they would be.

Q. You didn't come to that hearing, did you?

A. No, sir, I didn't.

Q. None of the representatives of Oryx did come to that hearing, did they?

A. No, sir, they didn't.

Q. The presumption in this pool is that we have 640-acre gas basin; isn't it?

A. Yes, sir.

Q. What would be the radius if you assumed a radial drainage around the gass well that that circle contained 640 acres?

A. I believe that radius would be approximately 3,000 feet.

Q. Yeah. Just a few feet short of 3,000, I think.

A. Yes.

Q. So a well located 1650 from a side boundary at a standard location is going to have a drainage radius that extends over into the adjoining section, isn't it?

A. That is true.

Q. If we take that drainage radius and honor the east-west boundary, maintain that 1650 boundary, take that circle now and drop it down to the 330 location on the south boundary, there is going to be a portion of Section 17 in which the second circle exceeds the first, isn't it?

A. Yes, there will.

Q. Do you know what that percentage change would be?

A. No.

Q. Have you conducted or made any note flow calculations with regards to how these wells have established a boundary between them?

A. No.

Q. Have you established actual drainage boundaries for any of the wells?

A. No.

Q. Does your penalty formula that you have proposed take into consideration the relative thickness of the reservoir underlying either spacing units?

A. No.

Q. Does your penalty formula take into consideration the interpretation of your geologist that we are limited by the dolomite-limestone facies change in the northwestern portion of this spacing unit?

A. No.

Q. Does your proposed penalty take into consideration the producing rates of the wells one to another?

A. No.

Q. Does your penalty formula take into consideration the structural position of one well to another?

A. No.

Q. The structural position between 17 and Section 9?

A. No.

Q. Does your penalty formula attempt to establish a no flow boundary between the wells that will allow the gas reserves between Section 9 and 17

to be produced by their respective wells?

A. No.

Q. The pink line, Mrs. Wilson, that pink line sets an 8,000 foot distance from the Oryx well to the closest standard location in Section 9. I assume that's that distance?

A. Yes. That distance is approximately 8,000 feet.

Q. Now, we have established that as a point beyond which then Oryx has no objection?

A. That is true.

Q. Yet if we look at the pool rules, we can have wells without penalty being as close as 3,300 feet between wells, right?

A. Let me add them up.

Q. Sure. 1650 and 1650.

A. Yes.

Q. When we look at Section 17 we find that the well that you operated in your unit is 660 feet from the southern boundary that separates 17 from 20?

A. Yes.

Q. And that was done without penalty, wasn't it?

A. Yes, it was.

Q. That well has not been penalized?

A. No.

Q. When we look at the other well in 18 -- I think that was originally drilled by Mr. Enfield -- the Burnell Federal Well, that's at an unorthodox location?

A. Burnell No. 2.

Q. The No. 2 down in the corner of 18?

A. Yes.

Q. And that was done without penalty, wasn't it?

A. Yes, it was.

Q. When we look at the Marathon well in Section 10 out of the southwest corner, that's at an unorthodox well location, too, isn't it?

A. Yes.

Q. And that well was approved at that location without penalty, wasn't it?

A. Yes.

Q. Do you have or have you made any engineering studies to tell us what the actual drainage areas are of any of the wells?

A. No.

MR. KELLAHIN: Thank you. No further questions, Mr. Examiner.

MR. CARR: I have just a few on redirect.

HEARING EXAMINER: Sure.

REDIRECT EXAMINATION

BY MR. CARR:

Q. Ms. Wilson, in response to questions from Mr. Kellahin you indicated that the well in the southwest of the Section 10 was at an unorthodox location; that's correct?

A. Yes.

Q. And it was your understanding there was no penalty; is that right?

A. That is true.

Q. Is that well within the outer boundary of the unit that is operated by Marathon?

A. Yes, that well is within the unit.

Q. Is it unorthodox by being too far to the southwest?

A. Yes.

Q. Does Marathon operate the acreage to the south?

A. Yes.

Q. Does it operate the acreage to the west?

A. Yes.

Q. Does it operate the acreage to the southwest?

A. Yes.

Q. As to the well that is drilled at an unorthodox location in 17, is that well within a unit operated by Oryx?

A. Yes.

Q. Is unorthodox because it is too close to the south line?

A. Yes.

Q. And is the acreage to the south operated also by Oryx?

A. Yes, it is.

Q. As to the well in Section 18 that is at an unorthodox location, when that location was proposed do you know if any offsetting operator objected? Do you know?

A. I don't know.

Q. I'd like to ask you some questions concerning radial drainage. First of all, a well at a standard location, the closest standard in the Southwest 1/4 of Section 9, would the radius of drainage if it's 3,000 feet extend beyond the section line?

A. Yes.

Q. Would it extend into Section 17?

A. Yes.

Q. If the well was at that location without

getting an exception to the rules would Oryx be able to come in and drill a well in the northeast of Section 17 to offset it and offset the drainage?

A. Economically, yes, we could drill a well there, that would offset that drainage.

Q. Based on your understanding of this reservoir, would you recommend to your company that a well be drilled in the northeast of Section 17?

A. If that were the only spot available on that lease for reasons such, say, topographic reasons, and that was the only location I could drill on that lease, I would pick better locations -- but if that were the only location, I would pick that location and I would drill it.

Q. Do you believe you could drill an economic well at that location?

A. Yes.

Q. In terms of radial drainage as an approach to a penalty, do you believe using a radial drainage pattern as an approach to a penalty would be appropriate?

A. In theory it would. In this case I think everyone has agreed on the fact that we don't have a radial drainage here because the limestone-dolomite facies change is -- radial drainage is just not

possible with the proximity to the limestone dolomite facies change.

Q. In your opinion, would that approach be consistent with the reservoir geometry?

A. No, it would not.

Q. Now, we have heard a lot about what you didn't consider in your penalty. When you recommended this penalty, did you consider the encroachment that was being gained by moving this location into the southwest?

A. Yes.

Q. Did you consider the advantage that could be gained from location on the property which Oryx operates in Section 17?

A. Yes.

MR. CARR: That's all I have.

MR. KELLAHIN: Nothing.

HEARING EXAMINER: Anything further?

MR. STOVALL: Mr. Examiner, I've got a pink-line question.

EXAMINATION

BY MR. STOVALL:

Q. The geologist told me that you would be able to answer the question as to why you picked the distance from the Oryx well in southwest of 17 as

opposed to the to the corner where the sections meet?

A. To be honest, I did not think about using a line from that corner. However, when I called Marathon, and, you know, asked them -- told them, "Would you consider this location or any point between these two?" I received a very abrupt answer. They just said, "No. No way." At that point they could have come back and said, "Well, how about something out of the corner instead of away from your well," or something at point. But being perfectly honest, I did not think about taking it out of the corner.

Q. One other question in that regard. If they were to drill a well somewhere on or behind your pink line, would you then recommend that there be no penalty, or how would you apply your penalty formula in that situation?

A. In that situation, since I feel that a well at or beyond that point would begin to have a negligible effect upon our lease, then I would say we could skip the penalty. That would be up to the people to the south to determine whether or not a penalty should be assessed.

Q. Would you feel the same way if you use -- and I notice on your Exhibit 5 you've got a green line going from the corner to the most southwest orthodox

location. If you scribe that line around in an arc and the well were somewhere on that line, would you feel the same way? Do you follow what I'm saying?

A. No. On Exhibit 5?

Q. Exhibit 5, yes. Your Exhibit 5.

A. Yes.

Q. You see the green line you've drawn from the corner of the section to the orthodox location?

A. Oh, okay. Well, it's pink on this one.

MR. CARR: No. What Exhibit are you on?

MR. STOVALL: Oryx Exhibit 5.

MR. CARR: Do you have Exhibit No. 5. Ms. Wilson's Exhibit does not have that line. That's why her line is pink.

MR. STOVALL: Does this make more sense as you look at the new copy of Exhibit 5?

A. Okay, now start over. Now that I see where the line is.

Q. (BY MR. STOVALL) The green line on Exhibit 5, if you were to bring that around using the corner of the section an your center point and scribe an arc generally to the south -- do you follow what I'm saying?

A. Yes, I see what you're saying.

Q. If a well were drilled behind that line or

arc would you have the same feeling with respect to a penalty? That being an equal distance from your property line rather than your well?

A. Yes. I would have to say that if it were drilled on that arc.

MR. STOVALL: I have no further questions.

HEARING EXAMINER: Mr. Stovall, I don't quite understand what arc you are talking about.

MR. STOVALL: For you, Mr. Lyon, I'll draw -- oh, well, okay. Yes, just arc that around (indicated).

HEARING EXAMINER: Okay.

MR. STOVALL: I've just drawn on the Examiner's Exhibit, for the record, scribing the arc --

HEARING EXAMINER: You're drawing an arc --

MR. STOVALL: Radial arc from the corner of the section.

HEARING EXAMINER: -- from the corner of the section, the common corner of Section 9 and 17?

MR. STOVALL: Correct.

HEARING EXAMINER: I would assume that the green line represents a junction of the corner of the standard locations and the corner of the section, and that pink line in drawn perpendicular to that?

MR. STOVALL: I don't believe that's the testimony, Mr. Examiner. I think the pink line is the equidistant line from the well, I believe.

HEARING EXAMINER: Is that a line 8,000 from the well?

MR. CARR: Yes.

MR. STOVALL: And if they are perpendicular, it's coincidental, I believe.

HEARING EXAMINER: It's such a large radius, it looks like straight line.

THE WITNESS: Actually, can I amend my answer?

HEARING EXAMINER: You can.

THE WITNESS: I would think that rather than the line making an arc from the intersection of all of the Sections 8, 9, 17 and 18 -- 17 and 16, rather than the line going from that point making the arc, the green line, that that green line should be extended to the standard location in the northeast corner of Section 17, so that an arc from that point to their well would be what I would not oppose, since it would be an arc drawn from the nearest standard location in Section 17. I would not be opposed to it. I think that would be a better representation.

HEARING EXAMINER: Is there anything

further in case?

MR. KELLAHIN: May I take a moment and confer?

HEARING EXAMINER: Sure.

(Thereupon, a recess was held.)

MR. KELLAHIN: Mr. Examiner, I would like to swear and call one of my engineers to discuss Mrs. Wilson's proposed penalty at this point. I think that's the direct way to respond to what they have proposed, and I would like todo that.

MR. STOVALL: Excuse me, if we're going to do that, Mr. Kellahin, I've got a problem nomenclature case. Would have any problem if we did that. We'll go off the record now.

(Thereupon, a recess was held.)

MR. KELLAHIN: Mr. Examiner, I call at this time, Mr. Craig Kent. I would like to have Mr. Kent sworn at this point.

CRAIG KENT

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Would you please state your name and occupation.

A. My name is Craig Kent and I'm a petroleum engineer.

Q. Mr. Kent, have you previously qualified as an expert engineer before the Division on prior occasions?

A. No, I haven't.

Q. Would you take a moment and describe when and where you obtained your engineering degree.

A. I graduated from the Montana College of Mineral Science and Technology in 1986 with a bachelor of science in petroleum engineering.

Q. Subsequent to graduation, would you summarize, Mr. Kent, what has been your employment experience as a petroleum engineer.

A. I was employed by Marathon Oil as a petroleum engineer in 1986 and have worked in Lea County, New Mexico, since July of 1988.

Q. Have you participated on behalf of the Marathon Oil Company in an examination of the Indian Basin Field and with particularity the proposed unorthodox well location that is the subject of this case?

A. Yes, I have.

MR. KELLAHIN: We tender Mr. Kent as a petroleum engineer.

HEARING EXAMINER: Mr. Kent is qualified.

Q. (BY MR. KELLAHIN) Mr. Kent, let me go directly, first of all, with you to the subject of the existing well in Section 9, the No. 5 well?

A. Yes.

Q. Mr. Carlson has described for us his assessment of the necessity to replace that well. Would you describe for us from an engineering perspective what, in your opinion, has damaged that well?

A. Basically, the well was drilled through the existing gas/water contact. And during completion we feel that there was a poor cement job, and there's numerous cases in the Indian Basin Field of poor

cement jobs, poor primary jobs.

During the production period we have had to plug back the well numerous times to try to eliminate water production. Most of these attempts have been fairly successful, but while reducing water rate, we've also reduced the gas rate considerably.

In late 1988 the well started to produce an increased amount of water while decreasing the amount of gas produced. And in January 1989, the well ceased to produce oil altogether. I might note that this well was producing with the aid of a wellhead compressor. Subsequent to that, we made attempts to swab the well to return it to production. However, they were unsuccessful. We also tried to do a bottom hole survey on the well. This was unsuccessful.

It is our opinion that we have some sort of channeling of water from below the current gas/water contact behind pipe, which is preventing our well, the North Indian Basin Unit No. 5 from being productive.

Q. Let's see if I can ask you this in a simple way.

Is what is occurring with the No. 5 well a result of mechanical difficulty, or are we seeing a well like the wells farther to the east of the reservoir that are naturally being diminished in their

productivity because of being watered out by migration of the water from east to west?

A. It is our opinion that this well is experiencing some sort of mechanical difficulty. And we use as proof the North Indian Basin Unit No. 1, located in the Southwest 1/4 of Section 10, which produces from approximately 80 feet down dip of our well with very little water. There is enough gas and little water to make it an economic well.

Q. As part of this evaluation team of Marathon, have you explored the possibility that the unorthodox location will give you an unfair advantage over the Oryx well operated in Section 17? Have you studied that?

A. Yes, I have.

Q. Were you here in the hearing room when Ms. Wilson described her proposed penalty to be -- which she proposes the Examiner adopt in the order entered in this case?

A. Yes, I was.

Q. Based upon your study of the reservoir and your knowledge of the reservoir, Mr. Kent, in your opinion, is Ms. Wilson's proposed penalty one that is fair and equitable for Marathon?

A. No, it is not.

Q. Is that type of penalty necessary in order to protect the correlative rights of the interest owners in Section 17?

A. No, it's not.

Q. What have you done, what information have you gathered, and what types of calculations have you done to satisfy yourself that you can reach a conclusion about whether or not the unorthodox location you're proposing gains an advantage over Section 17 interest owners?

A. I first decided to take a look at the variance in the productivity of the well in Section 17 by scribing a circle of an area 640 acres, both at a legal location and an unorthodox location in determining the effect to the area in Section 17 which would be lost by Marathon drilling a well at an unorthodox location.

Q. Having approached that issue from that methodology, what did you conclude?

A. I concluded that the difference in area was approximately 5 percent of the area in Section 17.

Q. Give us, again, now the parameters that you selected to make a comparison about the encroachment question if you scribe the circles. Go through the steps again.

A. What I did, first, I scribed a circle which had an area of 640 acres with a center at 1650 feet from the west line, 1650 feet from the south line, which would then have a radius of 3,000 feet. I scribed that circle about that center point.

I then scribed a circle about a center point 1650 feet from the west line, and 330 feet from the south line, again, having a radius of 3,000 feet, and then calculated the area that was adversely affected by moving our well from a standard location to the proposed location.

Q. Within Section 17?

A. Within Section 17.

Q. And that difference is what percentage?

A. Five percent.

Q. Other than doing that, what other ways did you consider or discuss to determine whether or not you were gaining any possible advantage by the unorthodox location of your well over the interest owners in Section 17?

A. I looked at another method which considered no-flow boundaries between two wells. And what I considered in this was the producing rates of the two wells and net perforated feet of the two wells. According to Mr. Carlson's exhibit, we assume our well

will have approximately 30 feet of net pay.

Q. Let me start over. Let's go to what you have analyzed to determine the net perforated pay in the Oryx operated well in 17; what number was that?

A. That was about 34 feet.

Q. In establishing a no-flow boundary for the equation, what did you assume for the Marathon well at the 1650-1650 location?

A. I assumed a best case scenario for us, that we would have a well at least as good as any of the surrounding wells, which would be the same producing rate as the Oryx well in Section 17.

Q. So you assume for your well the same 30 feet, approximately, of net perforated pay that Oryx has in their well?

A. Correct.

Q. What are the other parameters in the no-flow calculations?

A. The distance between the two wells and the net perforated height.

Q. The net perforated height. What number did you use?

A. I used 30 feet for both wells.

Q. So that parameter is going to be constant as you move or take your calculation from the standard

location to the unorthodox location?

A. That's correct.

Q. The thickness will be a constant?

A. Correct.

Q. In the calculation, then, the only variable is the footage distance that you've moved from standard to unorthodox?

A. Correct.

Q. When you make the no-flow calculation at the Marathon standard location, and in the second no-flow calculation, changing the distance, which is the only variable, what is the percentage change?

A. Approximately 6 percent.

Q. In what other ways did you as a reservoir engineer examine the possible impact of the unorthodox location and what that impact might have on the interest owners in Section 17?

A. I then put together some volumetric data on each of the sections, and P over Z data on each well in each section. That didn't really tell me anything about how that was going to affect working interest owners in Section 17.

So I called my reservoir models department in Denver, Colorado, who have previously prepared a model of the Indian Basin Upper Penn Field.

Q. Let's describe the model now. Existing within the company there is a calibrated model that simulates the performance in the Indian Basin Field?

A. Yes, there is.

Q. What was the purpose that that's done?

A. That was just to predict cumulative recovery from the field to help us decide on future well locations, future compression projects, and, basically, help us to decide what kind of gas processing facilities we would need during the life of the field.

Q. Am I correct in understanding, then, the computer simulation of the reservoir was done for purposes other than studying the impact of this particular case?

A. Yes, it was.

Q. What parameters, then, did you have introduced into the computer reservoir simulation for the reservoir to tell you what was going to be the difference, if any, if you moved from one location to another within Section 9?

A. Basically, I asked our engineer to run our simulator two times. For the first time, with a new well located 1650 feet from the west line and 1650 feet from the south line. And then to run the same

simulator with a well located 1650 feet from the west line, 330 feet from the south line.

Q. Were there any variations in the input parameters put into the model between the two locations, other than footage location of the well?

A. No, there was not.

Q. So am I correct in understanding that if there is an error introduced, or an incorrect data point placed into the model, that that error is going to remain constant between the two calculation?

A. Yes, it would.

Q. When you simulated the reservoir conditions with the computer model, using the closest standard location, 1650-1650, did the computer give you what would be the total cumulative gas recovery from the Oryx well in Section 17?

A. Yes, it did.

Q. And what was that number?

A. Approximately 41.8 bcf.

Q. Then you had the computer run the model again using the unorthodox location?

A. That's right.

Q. Did you obtain output from the model that showed what would be the total cumulative gas recovery from the Oryx operated well in 17 if you moved your

well location as proposed?

A. Yes, we did.

Q. And what was that number?

A. 41.8 bcf.

Q. What was the magnitude of change?

A. Zero percent.

Q. I don't understand the modeling, and perhaps you can tell us, but why wouldn't there be a difference?

A. Basically, due to the way the no-flow boundaries are situated and the interference between other wells in the pool.

Q. It wouldn't surprise you, then, to see that result out of the model?

A. It was a little bit surprising, yes.

Q. But are there any reservoir parameters that you know, any physical data that you have, to cause you to believe that that number is not correct?

A. No, there is not.

Q. Were you satisfied that the computer modeling was history matched with actual data to a point that it was acceptable and satisfactory to you?

A. Yes, I was. I looked at each of the runs of the model and compared that with P over Z data. And the P over Z data and the model data agree.

Q. Is that a good way to realistically calibrate the model or check its accuracy?

A. I would say it's a fairly reasonable way to do it.

Q. Having satisfied yourself now, based upon computer simulation, that you are not going to have a net adverse impact on the interest owners in Section 17, did you attempt to examine the possible encroachment onto 17 in any other way?

A. No, I did not.

Q. You said you disagreed with Ms. Wilson about her proposed penalty formula. Can you give us some specific reasons why?

A. Well, first of all, our computer modeling data, my no-flow boundary calculations, my 640-acre circle calculations, all show that the impact on Oryx's well on Section 17 is going to be less than 10 percent. Therefore, a 40 percent penalty is very punitive and will actually result in production -- or production of reserves under Marathon's acreage, or that would normally be recovered by Marathon's well, that would be recovered by Oryx's well.

Q. Can you as a reservoir engineer -- let me ask you this. Perhaps you haven't studied it yet. Have you as a reservoir engineer studied the direction

of migration of the gas production as is withdrawn from the various wells in the reservoir?

A. Yes, I have.

Q. Can you give us some indication or some conclusions that you've reached based upon the study of the direction of migration of gas flow as it's withdrawn from the various wells.

A. Yes. Basically, due to the water drive in the reservoir, there is going to be some displacement of gas, basically, along the structure moving to the southwest.

Q. Do you gain an advantage, then, over Oryx with a well located, as you propose, for their interest in 17?

A. No, we do not.

MR. KELLAHIN: I have no further questions of Mr. Kent, Mr. Examiner. We tender him for cross-examination.

MR. CARR: Just one second.

CROSS-EXAMINATION

BY MR. CARR:

Q. Initially, you discussed the problems that you'd incurred with the existing well?

A. Yes, sir.

Q. Those problems you indicated were

mechanical in nature?

A. Yes, sir.

Q. Based on the information you have on the formation from the existing well, it would be possible to drill an additional well in close proximity to then avoid these water problems, would it not?

A. Yes, sir. That's correct.

Q. And so the basis for moving the well is really to -- the structure and other factors that were discussed earlier by Mr. Carlson?

A. That's correct.

Q. When the Santa Fe Exploration well was proposed, were you involved in Marathon's response to that well?

A. Yes, I was.

Q. Were you involved in recommending that the penalty be imposed on that well?

A. Yes, I was.

Q. When we look at your no-flow boundary calculations, was Mr. Carlson's geology in any way factored into that?

A. Yes, it was.

Q. What did you use? Did you use his reservoir limit, or did you use the limit of the dolomite, or both in that?

A. Basically, the no-flow boundary between the two wells, the limited dolomite and the edge of the reservoir, did not come into play.

Q. In any way?

A. In any way.

Q. So the geology was not a factor in making those calculations?

A. That's correct.

Q. When you did your modeling, was the geology a factor in any of your modeling?

A. Yes, it was.

Q. Did you utilizes Mr. Carlson's interpretation in conducting your modeling of the reservoir?

A. The reservoir parameters that are in the model were as a result of work done previous to Mr. Carlson's revision of the documents that see here.

Q. So you wouldn't have adjusted a limit of the dolomite, based on his subsequent work on the reservoir?

A. No, not significantly.

Q. When you talk about your radial approach to drainage, if you had a well at a standard location -- the nearest standard location in the Southwest of 9, obviously -- the 3,000-foot radius of drainage would

extend beyond the reservoir limit, as depicted by Mr. Carlson; isn't that right?

A. Yes, it would.

Q. And at your unorthodox location it would also?

A. That is correct.

Q. That would tend to affect the accuracy of that approach for imposing a penalty?

A. That is right, and that is why I went to the no-flow boundary calculation.

MR. CARR: That's all I have.

HEARING EXAMINER: Nothing further?

EXAMINATION

BY HEARING EXAMINER:

Q. Mr. Kent, let me see if I can restate what your model study showed. If I heard you correctly, you said that the model said that with your well in Section 9 drilled at a standard location, that the Oryx well's predicted ultimate recovery was 41.7?

A. Point eight.

Q. It was 41.8 in both cases?

A. Yes, sir.

Q. Well, I had written down 41.7, and I was wondering why there was a difference, particularly in that direction.

I think that's all I have.

Anything further?

MR. KELLAHIN: No, sir.

MR. CARR: At this time I would recall Ms. Wilson.

HEARING EXAMINER: All right. Mr. Kent may be excused.

HEARING EXAMINER: Proceed, Mr. Carr.

FURTHER EXAMINATION

BY MR. CARR:

Q. Ms. Wilson, did you also perform a model of this reservoir?

A. Yes, I have performed a numerical simulation of the reservoir.

Q. What was the purpose of this simulation?

A. It was to study the reservoir. Oryx was very interested in finding out more about the reservoir after we had purchased the two Enfield properties in Section 17 and the one beneath it.

Q. What type of model was actually used.

A. It was a numerical simulation performed on our Cray X & P.

Q. What cell size did you use in that model?

A. The cell sizes were actually 1600 feet by 1600 feet. Now, I realize this is a huge cell size,

but we have a very large computer and this field is so large, that that was the smallest cell size that I could use and still simulate the whole field.

Q. What parameters were used in making this simulation, generally?

A. Well, I imput porosity, which varied from well to well depending upon the reservoir properties, and the permeabilities that varied from well to well. I tried to base that on build up data and core data ~~it~~ if I had it. I put in the net thickness in each well, water contacts if they existed. Capillary pressure data.

Q. And what conclusions were you able to obtain based on your simulation of this reservoir?

A. Well, I agree with the previous testimony in that I was able to obtain a very good match between the P over Z predicted by the model, or the past P over Z that the model would simulate, and the past P over Z performance that the wells performed.

However, when you took this down to a closer level, looking at individual wells at individual well performances, the model looking at individual wells was not accurate. Obviously, 1600-foot cells are not going to give you accuracy in oil production of this nature.

Q. Based on your experience with modeling of this reservoir, were you able to obtain information that would be sufficiently accurate to be utilized in imposing a penalty on wells in the reservoir?

A. No.

Q. Based on your experience with modeling of this reservoir could that explain why when you model a reservoir they can see no change in recovery from your existing in Section 17?

A. Yes. Yes.

HEARING EXAMINER: Mr. Kellahin?

MR. KELLAHIN: No questions.

HEARING EXAMINER: Anything further in this matter?

Closing.

MR. CARR. Brief closing. I'll try to be.

May it please the Examiner, Oryx is before you because we believe we have a legitimate correlative rights problem. Marathon is proposing to drill a well which is too close to property we operate.

We believe they are gaining an advantage on us, and we are asking you to enter an order that will offset that advantage, either by denying the application or by imposing a meaningful penalty on the

well's ability to produce. We're talking about the Indian Basin Upper Penn gas pool. And as we have all heard today, this is a pool in which there are high permeabilities, 640-acre spacing, and also setbacks of 1650 feet from the outer boundary of the spacing of proration units.

State-wide there are special pool rules governing the development of a property not superseded by a voluntary unit agreement. And you may have a unit agreement. And you may be able to comply with it, but when you are in violation of the spacing rules and encroaching on your neighbor, it is appropriate for the offsetting party to come before and ask to enter an order that will offset that advantage. And that is exactly why we're here.

When Marathon was confronted with an unorthodox location application by Santa Fe Exploration or Santa Fe Energy, Marathon was instrumental in coming in and obtaining a penalty. Now, in the same reservoir they come back before you and they see no need for one.

They were able to obtain a 60 percent penalty. Oryx, using a similar approach and an approach that was adopted, we submit, by the order, seeks a 40 percent approach, and we have shown you how

we get there. And we believe that this will offset the advantage.

Now, Marathon says there's new data, new information. They come in and they have moved in the last few weeks the dolomite boundary in the reservoir, based on this new information that they have obtained from the wells down in Section 18. These are poor wells. Because of that, they have moved the dolomite to the south and the east.

But the poor wells are the Burnell No. 1, that produced 5 bcf of gas, which in our opinion is not a poor well, and the well at the unorthodox location, the information on which they have utilized to move that boundary is still producing, and has produced 2 bcf today. And as the testimony indicates, we drill wells to recover that kind production.

We submit to you that they are grasping at straws and have changed an exhibit for the hearing, as opposed to the exhibit they submitted when they sought administrative approval, because the change in the case is helpful to them in avoiding a penalty.

Even their own estimates come in showing that they have gained something, and we submit that their estimates are inconsistent with the geometry of this reservoir and are based on geologic

interpretations that if they are suspect, the engineering must also be suspect. And yet even admitting there is encroachment, admitting that some penalty is appropriate, they stand before you and say, "Absolutely not. Give us none." And we submit to you that what they are asking you to do is to become their partner in violating correlative rights.

Now, Marathon comes in and they say, "Yes, we want to be far away from the dolomite-limestone facies. And, Mr. Examiner, that's a proper consideration. And they say, "We want to be away from water if there is a gas/water contact," and if there is, that is a proper consideration.

And they say, "We're going to be away from the area we've produced." Well, that's a proper consideration too. "And we're going to get over to the extreme boundary of our unit where we can drain everything that might be swept from the east." And that's legitimate too. But it isn't legitimate any longer when the offsetting operator comes in and protests because of the advantage that is being gained.

There is only one penalty approach before you. No one has presented any other recommendation as to how this well should be penalized. They have

discussed other ways they've looked at it that exonerates them, but there is only one recommendation before you.

And on this record we submit that there are only two choices. Deny the application, because they have standard locations available to them, or grant it and impose the penalty based on what we have recommended, because it will be an effective penalty. It will protect correlative rights, and in granting an order with that penalty, you will have carried out your statutory responsibilities.

HEARING EXAMINER: Thank you, Mr. Carr.

Mr. Kellahin.

MR. KELLAHIN: My goodness gracious, Mr. Examiner, we have been trying to be good neighbors with Oryx here. Mr. Carr has just argued a case that I'll contend he didn't present. If he's worried about all these things, why didn't he tell you what the drainage was between the wells. Why didn't his reservoir engineer give us all those information?

What do we have? We have Mr. Rojas tell us that the penalty and his pink line have no rational foundation in the geology.

We have asked Mrs. Wilson, was there an engineering fundmental foundation in the penalty she's

proposed. No, sir. I asked her everything I could think about, trying to help her give me some engineering basis for that penalty, and she didn't do it.

Mr. Carr is arguing a case he didn't present. Where was Mr. Carr and Oryx or Sun when I got the penalty against Santa Fe on behalf of my client, Marathon? Where were they? They weren't here. He's talking apples and oranges.

Look at the display, there is no fundamental disagreement with what Santa Fe was trying to do with that corner shot in the southeast corner of Section 8. They didn't have any reservoir to produce. It had been condemned with two prior attempts, north and east of the limits of the reservoir. And they come in here and corner shoot another effort to get into the Marathon reservoir and to get into the Oryx reservoir, but where was Oryx? They weren't here.

That penalty was calculated and imposed based upon our efforts to get that penalty. It had a rational basis because of the relationships of the reservoirs. There was nothing to support a well in the southeast corner, except our share of the gas. And that's not what is occurring here today.

What we're looking for is the opportunity

to extract the rest of the gas reserves in Section 9. And despite the fundamental differences between Mr. Rojas and Mr. Carlson about how they have interpreted the same data, the fundamental principles are in agreement.

Mr. Rojas and Mr. Carlson agree that you structurally improve your position over the existing No. 5 well by honoring the structure and moving to the west. That you remove yourself from the dolomite-limestone facies change by moving to the south. And you move away from the closest standard location to the unorthodox location.

To show you how goofy their proposed penalty is, I asked Mr. Kent other possible penalities. There is no more foundation for their proposed 40 percent penalty -- which is this arbitrary theoretical, arithmetic calculation. It has no rational basis to the reservoir.

Then what Mr. Kent suggested was a double circle. And we have used double circles here before this Examiner and before this Division. And he says the magnitude of change between one circle and another is 6 percent.

I said, "Well, Mr. Kent, put some science on that. Make it real." And what does he do? He

assumes the worst case for himself and the best case for Oryx, and he calculates a no-flow boundary for a well at the closest standard location for the Marathon well. He makes the same calculations with the same reservoir assumptions out of the reservoir, and he makes a second calculation. The magnitude of change? Six percent.

How can you explain or justify or adopt a penalty of 40 percent when the best science applied to it says 6 percent. He simulates it in the reservoir. Well, maybe Marathon's reservoir simulator is better than Oryx's, because my man was able to calculate for me what the ultimate recovery is from the Oryx well at both locations. And he comes up with no net difference. That testimony is unrefuted. All Mrs. Wilson says is she can't make her simulator do it. Well, we can and we did and there is no problem.

We say that you can approve this location. We haven't proposed a penalty to you. There's no one justified. We believe you're fully within the scope of your authority and that the substantial evidence not only suggests, it demands that you approve the location without a penalty.

Thank you.

HEARING EXAMINER: Anything further in this

matter?

We will take the matter under advisement, and the hearing is adjourned.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9802 heard by me on November 1, 1989.

Victor 2. Lyon, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

I, Diana Abeyta, 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 28, 1989.

DIANA ABEYTA
CSR No. 267

My commission expires: May 7, 1993