STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

1 February 1989

EXAMINER HEARING

IN THE MATTER OF:

Application of Meridian Oil, Inc. for compulsory pooling, San Juan County, New Mexico, and	CASES 9593 9594 9595 9596 9598
Application of Meridian Oil, Inc. for compulsory pooling and an unorthodox coal gas well location, San Juan County, New Mexico.	9599

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division:

For Meridian Oil, Inc.:	W. Thomas Kellahin Attorney at Law KELLAHIN, KELLAHIN & AUBREY P. O. Box 2265 Santa Fe, New Mexico 87504
For Amoco Production Company and for ARCO in Case 9593:	William F. Carr Attorney at law CAMPBELL & BLACK P. O. Box 2208 Santa Fe, New Mexico 87501

I N D E X

E X H I B I T S

MR. CATANACH: We'll call next Case Number 9593, which is the application of Meridian Oil, Inc. for compulsory pooling, San Juan County, New Mexico.

Are there appearances in this case?

MR. KELLAHIN: I'm Tom Kellahin of the law firm of Kellahin, Kellahin & Aubrey, Santa Fe, appearing on behalf of Meridian Oil, Inc.

MR. CATANACH: Are there any other appearances in this case?

MR. CARR: My name is William F. Carr with the law firm Campbell & Black, P. A., of Santa Fe, appearing in Case 9593 on behalf of ARCO and also Amoco Production Company.

MR. KELLAHIN: Mr. Catanach, we would request that you also call Cases 9594, 9595, 9596, 9598 and 9599 at this time. The testimony is similar in each of these cases and we would present testimony in all of them at the same time.

We will have four witnesses to be sworn.

MR. CATANACH: Are there any objections?

MR. CARR: No objection.

MR. CATANACH: Case 9594,

application of Meridian Oil, Inc. for compulsory pooling, San Juan County, New Mexico.

Case 9595, application of Meridian Oil, Inc., for compulsory pooling, San Juan County, New Mexico.

Case 9596, application of Meridian Oil, Inc., for compulsory pooling, San Juan County, New Mexico.

Case 9598, application of Meridian Oil, Inc., for compulsory pooling, San Juan County, New Mexico.

Case 9599, application of Meridian Oil, Inc., for compulsory pooling and an unorthodox coal gas well location, San Juan County, New Mexico.

Are there other appearances in these cases?

MR. CARR: Mr. Examiner, my name is William F. Carr, with the law firm Campbell & Black, P. A., of Santa Fe.

We appear in each of these cases on behalf of Amoco Production Company.

MR. CATANACH: Will the witnesses please stand and be sworn?

(Witnesses sworn.)

MR. CATANACH: Mr. Kellahin?

MR. KELLAHIN: Thank you, Mr. Examiner.

(REPORTER'S NOTE: Due to a flaw in taping this portion of the hearing some testimony was not clearly recorded.)

-- was made in conjunction with various members of Meridian's engineering group.

Our second witness is one of those engineers, Mr. Pat Bent. Mr. Bent is a drilling and operations engineer and he will provide testimony on his part of that study which includes his opinions and comments with regards to the penalty factors attributable to the mechanical and operations risks of these types of wells.

Finally, we'll call John Caldwell, who is a Senior Reservoir Engineer with Meridian and he will discuss with you the other factors and parameters Meridian considers important in assessing an appropriate penalty factor for what we consider unconventional type drilling in the Fruitland Coal Gas formation.

Mr. Caldwell's testimony will be generally focused on reservoir factors that encompass that risk and inherent in this study is some economic consideration.

Normally we put the landman on first to discuss with you the efforts we've made to obtain voluntary joinder.

In this particular instance Mr. John Myrick, our landman will testify last and he has organized the exhibit books so that I think while we are presenting some of the exhibits out of numerical sequence, they still can be understood very clearly if you take them out of sequence. There is a separate exhibit book for each of the seven cases. Those are before you.

Also before you is a brown folder that contains the geologic exhibits of Meibos. Along the walls of the hearing room today are Mr. Meibos' geologic exhibits so that you can refer to them as he discusses and then you have your own set to refer to later. The exhibit books are marked so that Mr. Meibos' exhibits are identified under Tab Exhibit Seven and then he's numbered them Seven-A through Seven-E.

After his exhibits, following Exhibit Eight tab, within that series of exhibits in that section you'll find a summary of the risk penalty analysis that becomes part of the testimony of all three of the technical experts, and then following that summary are the technical documents for Mr. Bent and Mr. Caldwell to discuss.

In each exhibit book, then, you'll find from Exhibit One through Six, all within the same sequence, (not clearly understood) followed by a plat showing you the spacing unit and the well location.

Exhibit Three will then be a compilation of his chronology of events in his efforts to obtain voluntary joinder by the various parties to be committed to the well.

He further identifies the specific interest owners and what the current status is of their efforts to obtain voluntary joinder. He will give you the authorized expenditure for the well and in each instance the Authorization for Expenditure has been approved and processed by Mr. Pat Bent, who is one of the witnesses today. And then finally, in Exhibit Six is a model form operating agreement for each of the wells.

We do not propose to go through each page of each exhibit book but to start off with, Mr. Meibos' geologic presentation and then after he makes his general presentation, we will go to his specific opinions with regard to the inherent geologic risk involved for each of the wells.

(Not clearly understood) of the parties to be pooled, let me briefly tell you the current status of the parties to be pooled, starting off with

the first case, of what I understand to be participation at this point.

In Case 9593 to be pooled were ARCO, Tenneco, and Conoco. Conoco has subsequently joined. Tenneco interest has now been acquired by Amoco. I'm advised by Mr. Myrick that he confirms Mr. Carr's comments to you awhile ago that ARCO can be dismissed from this case and it's the only case in which they have an interest.

In Case 9594 to be pooled were Tenneco and Conoco. Conoco has agreed to participate. Tenneco interest is now under the control of Amoco. In addition, Case 9594 has a typographical error in the docket sheet. That should be Township 30 North instead of Township 31 North. We'd like to present this case today and simply have it readvertised for correction on a subsequent docket.

Case 9595 involves the interest of Tenneco, Conoco, Texaco and an individual, spelled T-U-R-R-I-E-T-T-A. Again, the Conoco interest has agreed to participate. The Tenneco interest is now controlled by Amoco and so the parties to be pooled are Amoco, Texaco and Turrietta.

In Case 9596 originally were Conoco, Tenneco, forced pooling of those interests. Conoco has now agreed to participate. Tenneco interest is now

controlled by Amoco and so the parties to be pooled are Amoco, Texaco.

In Case 9598, again it was Tenneco and Conoco originally to be pooled at the time of the application.

Conoco has agreed to participate. The Tenneco interest is now controlled by Amoco.

And then finally in Case 9599 the only original two parties were BHP and Mesa Limited Partners. Mesa Limited has agreed to participate and they're to be dismissed, leaving the only party to be pooled in that case to be BHP Petroleum.

(There followed a discussion off the record.)

LYNN MEIBOS,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A Lynn C. Meibos. I'm Senior Geologist with Meridian Oil in Farmington, New Mexico.

Q Mr. Meibos, on previous occasions have you testified as a petroleum geologist before the Division?

A Yes, I have.

Q And pursuant to your work with your company have you made a study of the various geologic factors and information available for the seven compulsory pooling cases, applications that are now the subject of the consolidated hearing this afternoon?

A Yes, I have.

MR. KELLAHIN: We tender Mr. Meibos as an expert petroleum geologist.

MR. CATANACH: He is so qualified.

Q Mr. Meibos, I want to direct your attention specifically to the issue in a compulsory pooling application which concerns recommendations and opinions as to the risk factor penalty to be assessed by the Oil Conservation Division against any working interest owner who elects after the -- who fails to elect within the election period to participate in the well. Do you understand that risk factor penalty concept?

A Yes, I do.

Q Do you understand that the maximum available percentage that the Commission can authorize is a 200 percent number?

A Yes, I do.

Q And do you understand that that number is in addition to recovering out of production the first 100 percent?

A Yes, I do.

Q In making a study of the recommendations you have for the Division Examiner on the risk factor penalty question, can you describe for us how you and others working with you attempted to analyze that issue with regards to these seven wells?

A Yes. We formulated a task force that consisted of myself, some of the reservoir engineers and drilling engineers, whereby we sat down and discussed the different risks involved in drilling a Fruitland coal well. Each area of drilling, reservoir parameters and the geologic parameters each have a different risk associated with the overall risk penalty and we tried to assess those differences and weight them with respect especially to the wells before the Division today.

Q Describe for us generally in your analysis what were the various categories of risk that was examined by the group.

A We looked at the geologic risk. the operational and mechanical risk, and the reservoir/economic risk.

Q In addressing those issues or that analysis to these particular seven wells, how was that analysis divided among the group?

A I was primarily in charge of assessing the geologic risk.

Mr. Dana Craney from our office in Farmington was -- sat in on several of the discussions regarding the risk.

John Caldwell and some other reservoir engineers discussed the reservoir aspect of the risk and made their opinions known about that.

And Mr. Pat Bent made his recommendations with regard to the mechanical and operational risks.

Q When we examine that portion of the analysis that involves the geology, your area of expertise, Mr. Meibos, describe for us what issues or factors were included within that issue.

A There are three primary factors that we considered.

The coal thickness was the first parameter. Coal character and coal petrology was the second parameter. The third parameter was the fractured nature of the coal reservoir. The production comes mainly from fractures within the coal.

Q So that we don't have to write down each

of the various parameters in each of the groups, let me direct your attention, sir, to the first page following Tab Eight. I simply picked Case 9593 and I've turned to the tabulation (unclear). When we look at that tabulation following Exhibit Number Eight, does that break you out the three areas of geologic risk that you examined for these wells?

A Yes, it does.

Q Let's take a moment before we discuss the specifics, and have you describe the concept of analysis by which the divisions were made. We've got four areas in which a risk factor was analyzed, the geologic, the reservoir, the economic and the operational aspect.

In examining those was there any agreement or decision in what percentage each of those factors made up or encompassed the whole risk?

A Could you restate the question?

Q Yes, sir. I want to understand if anyone of these had a numerical value applied to it that was uniformly applied to all seven of the wells.

A Specifically with regard to the geologic risk the factor that we found was 60 percent for all 7, 7 of the wells within the pooling cases today.

Q Am I correct in understanding then that you didn't simply say that out of the maximum 200 percent

perspective penalty that 25 percent or X percent of that risk in all instances must be attributable to the geologic risk?

A No. In fact we -- we broke the risk down depending on the area that the well was in and proportioned out, especially for the reservoir, economic and operations risk, different percentages. The geologic risk within this area that we're discussing is -- is such that the geologic risk for these seven wells remains fairly constant because of the changes in coal character, and inability to predict where fractures occur; and we broke down some of the other risk into different percentages of that total risk.

Q Let's come back to the specific geologic conclusions for each of the seven wells at a later time, Mr. Meibos, and let me have you begin to discuss for us the method by which you analyzed the geology for the Fruitland coal production and how you have determined in your mind, then, what the ultimate recommendation on a geologic risk would be for each of the seven wells.

A Okay. I'd like to start first by drawing your attention to the net isopach map, montage, that I have here on the wall.

You'll notice that the area included in the isopach map includes the townships in the north half of

29 North through 32 North, Ranges 7,8,9, 10 West, in the north central part of the San Juan Basin in New Mexico.

For locator purposes, to give you an idea of where you are, the Cedar Hill Fruitland coal is here. The 30 and 6, San Juan 30 and 6 Unit is outlined here. The contour interval for the map is a 10 foot contour interval of net Fruitland coal based on Meridian's mapping parameters. It's a generalized (unclear) computer to help us portray the general thicknesses of the Fruitland coal. It's not in detail.

The four logs portrayed on the montage illustrate generally the variability in the Fruitland coal interval from one area to the next; the Cedar Hill area, the 32, 8 area, the 30 and 6 area, and then just six miles east -- or west of the 30 and 6 within the 30 and 8 Township.

As you can see, each -- each log shows that the coals are different and it would be very hard to correlate them from one far-reaching part of the area to the other, and that's the reason for sharing those; however, if you --

Q Before you leave that display, Mr. Meibos, identify for us how you have located the seven wells that are subject of the pooling cases.

A Okay. (Not clearly understood) so there

are eight stars. We'll be discussing all but two of them today.

The Delhi Com #300, is that correct, and Turner Com #250 have been dismissed, so -- so these two aren't considered in the forced pooling but the rest of them are.

From there what I'd like to do is go to a dip (unclear) this map, it goes from the southwest of 31, 30 continuing through 31 of -- Section 31 of 31, 9, and as illustrated on -- 32 of 31, 9, is illustrated here. You can see that generally the same coal interval is present on the north end of the -- the northeast end of the cross section or as found in Howell Com "J" 301 Well illustrated on the (unclear) part of the montage; however, as you go from the northeast part of the township southwestward, you can see that there are several splits that develop in the thick coal seams.

Generally this cross section shows that there is relative continuity, relative zone continuity of the coals within the Fruitland formation; however, it also shows that there's extreme, or at least well to well, variability within each zone.

As you can see, there are several splits that develop within each, each zone from one to five, six splits of separate coal seams within each interval.

As you notice, the seams -- the seams are split more to the southwest than they are to the northeast. The increase in split southwestward is more likely a function of the depositional environment that was present during Fruitland coal deposition. The stratigraphic changes that took place influenced the coal capture and the net thickness of the coal. You may have a total net coal thickness of 30 feet in -- from one seam in one well, and a total net coal thickness of 30 feet in another well from 30 separate 1-foot seams. So net coal thickness isn't really an indicator of coal quality.

In past hearings we gave testimony that coal was relatively present everywhere we turned in the basin and the presence of coal doesn't lower the risk because of the changing nature of coal, its depositional environment and its nature is such that from well to well the coal character will change abruptly.

Just to review some of that, the general coal geology is such that the federal government has given us an unconventional reservoir tax credit for the Fruitland coal. It's not like a sandstone reservoir. It's different and it's differences are a function of different heterogeneity factors, the first one being the heterogeneous nature of the depositional environment. If you can think back or if you've been to the east coast and seen the

swamps on the east coast approximate to the Atlantic seaboard, you know that there is a varied environment of coal or of swamp material and during Cretaceous time when the Fruitland coal was developed, we had a mix of environments. We had swamps that were approximate to the ocean front; there were swamps that were far removed from the ocean front, 6, 7, 8, 10, 20 miles away from the ocean, all of which were depositing peat, and we had rivers and lakes and animals that mixed the swamp and organic material together to create a mishmash of different things.

Coal itself, the definition of coal is that it's a heterogeneous mix of mineral matter and organic matter, mineral matter being made up of typical minerals. illite, kaolinite, smectite, and quartz is another one, and associate siderite and some other different minerals; whereas, the organic material is made up of coal macerals and macerals are -- is a term that means relatively the same as minerals only it refers to the organic content of the macerals, made up of three main lithotypes, the first being liptinites, which include waxy or oily components of plants; vitrinites, composed of woody components of plants; and inertinite, which is the charred component of a plant.

If you take that, if you mix in the modus of deposition, the rivers and the streams and the swamp and then you mix the different organic materials to-

gether, you develop a very heterogeneous mix that would change from one location to the next relatively abruptly. Coal's physical properties, because of this, coal's physical properties change from area to area, like I said, relatively quickly, and they also change through time.

If a well is drilled and you change the pressures and physical parameters within a wellbore, there are certain things that can change the coal as you change those pressures, and the coal will break and move into the wellbore or you can find little particles that can break into big chunks and close off the wellbore because of its physical character. Its physical character differences also, you know, change the amount of gas that is recoverable from each individual seam. The desorption rates that are recoverable from each seam is different because of this difference, difference in coal character.

Q What I'd like to do now is before you leave this let's identify it.

A This is the cross section A-A'. The Fruitland, base of the Fruitland formation is -- the top of the Pictured Cliff sandstone is this fine line shown here.

Q Do you have a display, Mr. Meibos, now that demonstrates for us not only the lateral but the vertical characteristics of the coal?

A Yes. I was going to talk a little bit

about this one first.

Q All right, let's do the D-D' cross section and that's Exhibit Seven-C.

A This cross section in Township 30 North, Range 8 West. The furthest well to the right here is the same well as I put here. It goes basically four miles directly to the west. This is a strike cross section.

Now I tried to follow the same thickness of coalbeds to illustrate the heterogeneity of the coal as much as I could within similar seams (not clearly understood) parameters they seem clearly to me very similar.

The cross section does show that the seam thickness and continuity is relatively constant. It does show also that there are still several different splits in the coal that develop at different places, making individual seam thicknesses variable.

The other thing that it shows, and you can't see it very well, but it's at the base of each of the cross sections I've indicated the production range that we've been able to determine from each of the wells.

The first delivery raste I posted where it's been available and where I have preliminary flow test data I've posted that just to show you the variability in production rates through similar appearing seams.

This well has a flow test rate of

2.2-million a day. Before it was tied to the line the first delivery, the first 30-day deliverability had been 589 MCF a day. It was open hole completed and it's been producing from all three zones.

This well and this well were completed by Tenneco.

Q You'll have to identify them for the record.

A For the record Moore No. 3-A and the Lawson No. 1-A; the Moore 3-A in the southeast of 4, 30 and 8; the Lawson 1-A in the northwest of 10, 30 and 8, were completed by Tenneco. Their first delivery (not understood). They didn't produce yet they were completed as (unclear). The cross sections shows the 301, which is in the northeast of 11, 30 and 8. As we go further to the west the Tenneco Moore No. 6-E was completed in the same three zones and the first delivery rate was 107 MCF a day.

And finally, to give an attempt to compare, these were perforated in the coal so the Meridian well was open hole completed to compare the open hole completion here the two other Meridian open hole completions, a well offset to the Howell A-4 E in the southwest of 30, 30 and 8, is the Meridian Howell A No. 301 in the same quarter section was open hole completed and had a flow test

of 500 MCF a day, almost a quarter of the rate that the Howell Com 301 rate was.

In the northeast of 7, 30 and 8, which is the Meridian Oil Howell (unclear) No. 300 was an open hole completion. The flow test was too small to measure. It didn't produce at all yet the coals are all present. There's continuity in every seam, yet it didn't produce as did the (not clearly understood) No. 301. It's a function of the three parameters that I'll be discussing. The stratigraphy is one. The coal character, especially with regard to the mineral content and the maceral content and the cleating content, or the number of cleats in the hole, which I'll talk about a little bit later.

I'll go now with the Howell Com J Number 301 in the northeast of 11, 30 and 8. I've enlarged the log to the scale of 5 inches equals 100 feet. You can see the three zones. This log here is a gamma ray log and a high resolution bulk density log here. High resolution let's us pick out individual coals better. We cored this well from intermediate casing depth to -- or intermediate casing of 2886 to a total depth of 3124.

The coal description, I described the upper coal as coal, black, dull with bright bands, poorly cleated, concoidal fracture and no kicks.

The second, or middle coal, black, dull

with bright bands, poorly cleated, concoidal fracture, no kicks.

The lower coal I described as coal, black, dull-bright with brighter bands, well cleated, blocky fracture, well started in kick when core barrel was 1000 off bottom. They had to -- to control the well they had to mud up to 10.8. They went back to bottom of the core and then came out real slowly in order not to unload the well from the gas that was being generated in the special seam. Now, from my descriptions I assumed that there was some definite differences in the coal character. When we finished logging the well we saw some even more abrupt differences. This is a digital sonic log. It's a computerized log Schlumberger makes. It shows a compression wave and a sheer wave. The compression waves are not -- they're not real good in helping us determine coal character because the compression and the sheer waves are lost in the coals. The stony wave, however, is the wave that follows the wellbore and follows the tool up the wellbore and where it comes, wherever there's permeability, it kind of follows out. It goes out into that permeability and comes back in so that you can see from this log that -- that we encountered extreme permeability in the basal seam and through the upper relatively low permeability compared to the basal seam. The seams are still more sandstones and

shales but much more permeable than the basal seams and that was evident in the core description as well as the gas that we recovered from the basal seam.

Q Mr. Meibos, you've been referring to the Howell Com display and, Mr. Examiner, that's Exhibit Seven D in the exhibit book.

Mr. Meibos, are you able now, having found the -- a permeability zone in the lower coal section in the Howell Com, are you able now as a geologist to develop a mapping technique with that information that helps you diminish the risk in picking the locations for subsequent coal wells?

A No, we can't because there's nothing that we can take from most of the logs that are -- that are available with regard to permeability in the coal. We've subsequently run a digital sonic log on several wells and found it to be of marginal use in areas where there are thin coal seams. The resolution of the tool is such that where there are several thin beds the sonic data is ineffectual.

So the sonic data was good for the Howell Com J 301, but we found that it's marginal in other areas and some of the -- and some -- we ran it in one of the wells north of the Cedar Hill Unit and it showed some well cleated coals but we expected to find some well

cleated coals because of the mud log description that we recovered.

So mapping, mapping different logging parameters is relatively hard and next to impossible because of the kind of log data available and the amount of information that we can gain from that log data available.

Q Would you identify for us what is the last of your displays? It's marked as Exhibit Seven-E? It has a plastic overlay on it.

A The plastic overlay is the same sort of isopach data that I've illustrated on the montage, Number Seven-A.

The map here shows production rates for the first thirty days deliverability of Meridian wells and wells operated by people other than Meridian within the area I've selected and described previously. The forced pooled wells are starred again, as noted before. Meridian wells are triangles. The wells operated by people other than Meridian are hexagons.

The Cedar Hill Pool is here; the 30 and 6 unit is here.

This map shows the variability of production rates that occur from well to well within the different areas that coal wells have been drilled, and it is evidence, I think, more that the coal permeability varies

from well to well and from location to location and since the coal is the -- coal permeability is very, very small, it's less than -- much less than a hundredth of a millidarcy; in fact, some measurements that we've seen are as low as a thousandth of a millidarcy. Permeability is important in generating gas out of the coal and since there isn't any inherent permeability in coal, permeability must come from -- from the fractures, and as -- as we talked about in the Howell Com J 301 Well, the lower coal was fractured, the upper two coals were not, yet they were in the same wellbore. That means that the coal character must also influence the ability of the coal to fracture. The permeability from fractures is tied directly to the regional tectonics, local tectonics, coal character, and the hydro-dynamics of the whole system.

And this map illustrates best, I think, that closeology doesn't guarantee that fractures will be encountered by a particular wellbore.

Q Mr. Meibos, have you also familiarized yourself with all available published literature on the subject of coal in the San Juan Basin, the Fruitland coal production? Are you generally familiar with those publications?

A Generally familiar with the publications, yes.

Q And are you attempting to keep current on available technical papers that are -- have been presented or about to be presented on this topic?

A Yes.

Q In analyzing the geologic risk for these particular wells, have you availed yourself of the opportunity to examine some of those reference materials?

A I've done my best, yes.

Q What do those reference materials tell you in terms of your opinions and analysis about the risk for these particular coal gas wells?

A In particular some research that's been done by REI. Particular authors are located in Grand Junction, Colorado. They've come to the conclusion that -- that it's almost -- well, they've come to the conclusion that the ability to predict fractures makes the Fruitland coal, coal seam development very high risk.

Q The examiners are often asked to apply a risk factor penalty in a conventional sandstone gas reservoir, either the Mesaverde in the northwestern part of the state or some other formation in southeastern New Mexico, and I'd like to draw some comparisons or some -- I want you to see what comparisons can be drawn between typical sandstone gas production in anticipating the risk to be encountered versus trying to locate wells that will produce

gas in the Fruitland coal gas seams.

One of the things we attempt to discuss with examiners at pooling cases in the sandstone gas reservoirs are whether or not you are within an established gas pool or not. All right? Does the fact that these wells are located in the Basin Fruitland Coal Gas Pool, for you as a geologist, help you diminish or reduce the geologic risk?

A No, it doesn't.

Q Why not?

A Because of the -- the differences that we can see from wellbore to wellbore and from seam to seam in the coal. There's so much variability in heterogeneity that it's impossible for us to reliably predict all the parameters necessary in order to say that it's just like drilling a Mesaverde well. It's not like just drilling a Mesaverde well because of the different changes. I've been working as a geologist with responsibility over the Mesaverde formation for the last six years at El Paso, and the differences that occur between the sandstone reservoir and the unconventional coal reservoir are -- are so much so that -- that it's almost like drilling a wildcat well every time that we drill a Fruitland coal well. In fact, several of the wells that we've drilled would technically be classed as shallow pool wildcats by the APD form of classi-

fication.

So in comparing -- the differences in depositional environment, differences in how the homogeneity of the sandstone develops and how the heterogeneity of a coal seam develops are such that they are two separate things and ought to be considered much differently in their -- their risk penalty assessment than -- from one another.

Q Another approach to applying a risk factor penalty in a conventional sandstone gas reservoir is to have the geologist prepare a net pay isopach map with sufficient well control and thereby looking at his isopach, can find a location that helps him minimize the geologic risk.

Are you able to do that kind of analogy of risk for the Fruitland coal gas wells?

A No, we can't. We can make a -- we can make an isopach map of the net coal thick, as I've presented, but that net coal thick does not necessarily guarantee that we can make an economic Fruitland coal well.

As you can see from the cross section that I've illustrated, I guess it's Exhibit Seven-C, shows that though the coal is present and would have essentially the same net coal thick, it is obvious from the production rates that there's more risk and more heterogeneity to this reservoir than would be in a typical sandstone reservoir.

Q Another approach that's often taken to discuss with the examiner the minimized risk factor penalty in the sandstone gas reservoirs is simply the proximity of the location to a commercial producing well in that reservoir.

Are you able to find when you examine the Fruitland coal gas wells that you help minimize the risk by locating your wells in proximity to known commercial producing gas wells?

A Some people have tried that and we've tried that an it doesn't work. Proximity to a known good coal gas well often will lead to a poor well. Sometimes it will lead to a good well but you can't predict it. You'd hope that being close to one well, to a good well would -- would mean that you're going to have another good well, but because of the fractured nature of the reservoir, because of the heterogeneic nature of the coals is such that you can't really predict that, yes, I'm going to have a good well, and its risk should be diminished because of being close to a good well.

Q Let's take the exhibit books, Mr. Meibos, and let's start with Case 9593.

Let me have you turn to the tab following Exhibit -- the Exhibit A tab in the exhibit book.

A Okay.

Q Describe for us for the Atlantic B Com 220 Well, Mr. Meibos, what did you ultimately conclude with regards to the geologic risk to be applied for this well?

A Well, we -- the three different factors within the geologic risk are weighted differently within -- within that 60 percent that I've assigned for the total geologic risk for the Atlantic B Com 220.

The 60 percent total that is listed is something that was arrived by the consensus opinion of the different, different groups as to what portion of the total risk made up the geologic risk.

Because of the general continuity of the coals, because of the general inability to predict cleating of the coals in this area, those factors were relatively equal in my assessment.

The coal character is -- changes significantly enough from well to well, as I've shown with the Howell Com J 301 cross section and from scene to scene, that the coal characteristics are -- it's -- the coal characteristics are not predictable from well to well.

Q For any of the other wells involved in the pooling cases did you come up with a percentage risk factor penalty in the column on the far right that was different than the 60 percent?

A No, I didn't because they -- the wells

were all within the same general area. I feel like the 60 percent risk factor for geological factors is relatively the same.

Q And rather than go through all the other six or five pooling cases with you on an individual basis, am I correct in understanding that your testimony is you took each individual well and specifically applied the geology to that given well location to assess a risk factor penalty?

A Yes, I did.

Q And in each separate instance you came up with a 60 percent as a number to apply in the calculation?

A Yes, I did.

MR. KELLAHIN: That concludes my examination of Mr. Meibos, Mr. Catanach.

We would at this time move the introduction of his Exhibits Seven-A through Seven-E in each of the cases.

MR. CATANACH: Exhibits Seven-A through Seven-E in each of the cases are hereby admitted.

Mr. Carr, cross?

CROSS EXAMINATION

BY MR. CARR:

Q Mr. Meibos, as you constructed your geologic interpretation of this portion of the -- of this pool, did you rely primarily on well control information?

A Yes, I did.

Q Is there seismic data utilized up here at all?

A No, we don't.

Q So what you have here is just from individual well data.

A That's correct.

Q And you have developed sort of an approach to evaluating risk in a number of prospects as you indicated how you have a group that works with that, is that a procedure that's developed for other pooling hearings as well as the ones that we're hearing today? Is the same general procedure utilized?

A Generally, yes.

Q As you've utilized in the prior hearings?

A Generally.

Q Now, when you evaluated the various components of a risk penalty recommendation as you've set forth in your exhibits for each well, was it a group decision that 60 percent of it would be allocated to the geology in this area or was the decision made by you?

A It was a group decision.

Q And when you sat down you said, I think you said, correct me if I'm wrong, you testified that we decided what portion of the total risk was geology. Is that how you went about it?

A Yes.

Q Had you previously decided what the total risk would be?

A The total risk from what Mr. Kellahin has told me is 200 percent by statute.

Q And so you were looking at a 200 percent figure and saying, well, 60 percent of it is -- or 60 percent of the 200 is geology.

A Uh-huh.

Q And it came out the same in every one of the prospects.

A Yes, in this case it did.

Q Okay. Has it in other cases come out to be a different figure?

A Not in forced pooling hearings that we've been to, but if we were to drill a well, say, in the extreme southwest part of the basin, the geologic risk may be 50 percent of the total risk, or --

Q Had you --

A -- or 100 percent of the total risk.

Q My question really is when your group sat down did they decide how we were going to divide up the 200 percent or did you just come up with various factors and then total them?

A We decided how we were going to come up with the risk and then came up with the factors.

Q And they just happened to add up to 200 percent each time.

A We predesigned that they would add up to 200 percent based -- based on the fact that it's the rules.

Q Now, if we looked at the isopach, I think -- I don't know what exhibit this is. Is this One over here?

MR. KELLAHIN: It's Seven-A.

Q Seven-A, all right. This isopach shows reservoir changes across a fairly large portion of this pool, is that correct?

A It shows thickness changes.

Q Okay. Do you see similar thickness changes when you get closer to -- wells in closer proximity one to the other? When you start talking about closeology you would see the abrupt changes in thickness?

A If you look at the cross section, Exhibit Seven-B --

Q The top one?

A Yes. You can see here in the northeast of 14, 30 North, 10 West, and the southwest of 14, 30 North, 10 West, that there is an abrupt thickness change as to coal split to the southwest.

Q And are those offsetting locations?

A Yes.

Q And is that a common occurrence throughout the pool?

A In certain areas.

Q And when you say in certain areas, have you defined where those areas are? I'm not going to ask you to, but I mean have you defined areas where you experienced these abrupt changes?

A Not in every case; only in a few; in a few cases.

Q Would it be fair to say that the changes as you depict in the cross sections, are -- you're more likely to find these changes in the thickness across this area that you've mapped as opposed to looking at just offsetting wells?

A Will you rephrase the question?

Q Would you expect to see as much a change in thickness if you looked just at individual offsetting wells as what you have depicted with this cross section?

A The two offsetting wells that are de-

picted on the cross section show a rather drastic change.

Q But is that the norm or is that unusual?

A In some areas it's the norm and in some areas it's unusual.

Q Okay. And have you mapped to find these areas where you would expect that more than others?

A No, we haven't.

Q As we look at this, we can see that the basal coal is always present, isn't that correct?

A On these cross sections, it is, but it's not always present.

Q Are there areas where it is not?

A That's correct.

Q Are they areas that you can define?

A Given thirty more geologists, maybe.

Q Why don't we look at -- why don't we look at the Pearce No. 250. Are the triangles on -- on whatever this other exhibit is, the --

A The production rates?

Q Yeah, the production rates, the stars are the wells we're talking about at this hearing?

A Yes.

Q The triangles are Meridian wells?

A Meridian wells are triangles, yes.

Q Around the Pearce No. 250 there are a

number of triangles. Would you expect in that area that the basal coal wouldn't be present?

A The Pearce 250?

Q Yes, sir.

A The Pearce 250 is in Section 7 and the basal coal is present in the Pearce 250.

Q Okay.

A If I recall correctly.

Q Without going through all of these wells that we're talking about here today, are there any where you would expect as a geologist not to find the basal coal present?

A It's at least present but I don't think the presence of the basal coal matters.

Q Well, if you don't have it, it matters, doesn't it?

A Might, might not.

Q And you would think you could make a well in the basal coal if it wasn't there?

A In some wells that we've drilled the basal coal isn't as productive as the upper coals.

Q But if you're -- I'm just trying to see if generally speaking the basal coal is present in the prospects that you're considering, isn't it?

A Generally, yes.

Q Okay.

A And to what thickness it is, I couldn't say.

Q Okay. Now, if I understand it, you don't believe that closeology is probably a very valid tool in this reservoir.

A No, I don't.

Q You don't think that your -- the quality of your information improves directly with the quantity of it.

A No, I don't.

Q You don't think that you would have a better read on the acreage around this Pearce No. 250 than you would, say, a well several miles to the north where you don't have that kind of control offsetting it. Is that right?

A I don't think that -- that, like I said, that closeology is that helpful.

Q Would you think --

A Maybe if -- if we had five years of production data on the wells that we've drilled, then maybe, yes, but at this point I'd have to answer no.

Q Okay, well, how do you judge your -- the prospects that you recommend to your management if it isn't off of wells in the area?

A We recommend our prospects based on wells drilled through the Fruitland coal that haven't ever tested or completed the Fruitland coal, so we don't know if the Fruitland coal is even productive in many of the areas that we've drilled.

Q And you're making your recommendations to your management on wells that have never produced?

A That's correct.

Q Okay, and so you would feel that you would be justified with the data in the township north and east, or in the township north with the Pearce No. 1 that you can make a recommendation in that section as well as you could for the tract where the Pearce is actually located.

A That's correct, and we've done so.

Q Okay, then why do you drill them all together like that?

A That's where our acreage is.

Q That's the only reason? Is that the reason that there are pockets of wells throughout?

A That's exactly why.

Q And is that the only reason?

A That's the only reason. If Amoco woudl sell us their stuff, we'd drill more wells.

Q If you'd sell your wells to Amoco they'd

have another data problem, I'm sure, like you do.

But that is the only reason?

A That's correct.

Q Now, when you're looking for a good well fractures are important, is that correct?

A Yes, they are.

Q What -- other than just finding the fractures are there certain things that tell you where you would probably have a better chance of encountering the better fracturing in the reservoir?

A We try to hedge our bets.

Q And what would you look to to try and determine where the fracturing might be better in terms of hedging your bets?

A We would look at Landsat information and where we have it --

Q And what is that?

A Landsat is High Altitude Satellite photos.

Q All right. Anything else?

A And we'd use stereo photographs flown at low altitude.

Q Would you be looking at the quality of the coal itself --

A No.

Q -- to determine --

A The coal character or coal quality would have nothing to do with that type of a new analysis.

Q Okay. You would presume that better coal quality would have a better fracturing.

A Better coal quality -- coal quality is a term that's a little ambiguous. Some coals may appear to be of high quality; in fact, the two upper coals of the Howell Com J 301 appeared in hand -- hand examination to be of high quality. They were dull with bright bands, which isn't too much different than the basal coal. They may have had a little bit duller appearance but from what I can remember looking at them, they weren't that much difference in their quality; however, the lower coal was cleated and the upper coals were not.

Q When you talk about, oh, low test variability, things of that nature, do you have an opinion as to whether or not that's a factor of geology or maybe a factor of completion or producing techniques?

A Yes.

Q And what is that?

A I think that it's varied. It can be either. It could be a factor, a function of geology. It could be a function of completion techniques.

Q Or all of the above?

A Or all of the above, or both, yeah.

Q Okay. How many dry holes have you drilled out in that coal?

A I couldn't say.

Q Okay, and why is that? Because you're not producing?

A Because we haven't tied or tried to tie all of the wells to -- to the line yet. We're not sure which wells will produce and which wells won't yet, just as a function of the logistical problems and getting all the wells that were drilled hooked up.

So I couldn't -- couldn't answer that question.

Q Do you have some?

A Yes.

Q How many, that you know of?

A I couldn't specifically name them.

Q Okay. I mean --

A And I couldn't specifically name the number. I haven't studied that.

Q But you do have them?

A Yes, sure.

Q Do you think so?

A Well, I know the well on the end had a flow -- a flow test of too small to measure.

Q Okay.

A I know that and I know that there are several other wells that we've completed in a similar manner that have had flow rates of too small to measure, I know that, but I don't know if I can call them dry holes or not and since we're dealing with an unconventional reservoir, the conventional term of dry hole, I don't think, applies. Until we're able to assess this reservoir more fully, it's hard to answer that question.

Q When you do these, do you go back and fracture them, stuff like that? I mean that might change the profile on these wells later on?

A Some of the wells have been fractured.

Q And does -- am I getting you into an area that is not geology?

A Yes, you are.

Q Would you like to continue and try to answer them?

A I've practiced reservoir -- I've practiced engineering without a license in the past and I usually get myself in trouble, so --

Q Mr. Kellahin and I have practiced, too.

What I'm trying to do is get a sense of how -- what percent of the wells look like they might fall into a dry hole category. Is 10 percent in that league?

Is 25 percent?

A I couldn't say and if I -- if there was a concrete number I still don't think that it diminishes the risk that's there within producing the Fruitland coal.

I still think the risk is -- is high because of -- of all the other parameters, let along the geologic parameters that enter into getting the Fruitland coal to produce.

Q You mean a dry hole isn't the factor, is that what you're saying?

A If -- a dry hole is generally considered -- I drilled one once.

Q Up here?

A Up in the San -- not in the Fruitland coal. I drilled a Mesaverde well that was a water, water well, and right now we're trying to farmout the up hole stuff from you guys.

Aside from that --

Q And the downhole stuff, too?

A Well --

Q I'm kidding.

A But -- but that well, because I had recovered no gas out of the -- of the sand and recovered just water, I could make an assessment of that and knowing the character of the reservoir, knowing that it was just

sand and that I wasn't going to have any changes in the reservoir, just say, yes, this is a dry hole and we need to plug this zone and see if we can talk Amoco into giving us the rest of the well; whereas, in the Fruitland coal, and my counterparts will talk about this more in detail, the Fruitland coal character changes when you -- when you open the wellbore. You can have coal fines move in and plug the well off and it might have had a flow test that was high to begin with and you'd think, great, we've got as super well, but because of the changing character of the reservoir, boom, you shut the well in, like Amoco did the Kahn (sic) Well, and you destroy the well.

Now, would you call the Kahn a dry hole or not? I think the risk is still there though it has produced a bunch of gas, the risk of the coal producing gas is something that is a time intensive process.

Q Now, I'll try one more time and then I'm going to leave this.

A lot of wells out here, from what I understand, if I understand what you said, you can't even -- I don't mean that to be sarcastic -- you can't tell that -- what it's going to do; whether it's a dry hole or a great producer because it hasn't been produced yet. Is that what you said?

A Yes.

Q When you do that do you get an initial rate on those wells? Do you test them or anything?

A That's the flow test that -- that I was talking about regarding these.

Q All right, and does that initial rate give you any indication of what that well actually ultimately will do?

A No. We'd like it to, but it doesn't.

MR. CARR: I have no further questions. Thank you.

MR. CATANACH: Mr. Kellahin, do you have anything further?

MR. KELLAHIN: Thank you, Mr. Examiner.

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q Let's see if I can clarify something, Mr. Meibos, in relation to Mr. Carr's earlier questions. He asked you about a presentation in terms of prior hearings on forced pooling cases in Fruitland coal.

A Uh-huh.

Q You, in fact, before this very Division have made prior geologic presentations requesting a risk factor penalty, have you not?

A Yes, I have.

Q The geologic presentation the analysis shown on the tab following Exhibit A is significantly different than the presentation you made before, is it not?

A Somewhat different. I wouldn't say significantly.

Q All right, it is more detailed in its analysis and execution than you have made before.

A Yes, it's much more detailed.

Q And you made that in response to your dissatisfaction over the risk factor penalty applied by the Division in those prior cases, didn't you?

A That's correct.

Q Let's discuss some of those prior analyses so that I can understand what you have done in this particular group of cases.

A Okay.

Q The analysis of the risk factor in those prior pooling cases, let's assume that it was divided into three parts. A third was a geologic risk; a third was the mechanical risk; a third was the reservoir characteristics that were at risk.

A Uh-huh.

Q Within that last third, that third was again divided into thirds, whereby one third was assigned a

hydrologic risk; one third reservoir performance; and one third presence of coal in the wellbore.

A That was the geologic risk, if I recall correctly.

Q All right. In what ways does your analysis today with the collective group differ from an analysis that separates out the risk as I've just described it?

A Our analysis today differs in that the previous analysis assumed that if coal was present, that there was no risk to the coal, to finding coal.

Q Did you agree with that assumption in the prior pooling cases?

A We agreed that there is no risk to finding the coal where we have a wellbore that has already cut it. We know that -- and as most of these wells are either Pictured Cliff or Mesaverde wells, that I've shown in the my cross section, we know that coal is present in the subsurface.

Q Did you agree or disagree in the prior cases that the presence or absence of coal should be a factor by which you diminish the risk?

A We disagreed with -- with it, because the presence of coal is not the risk. The risk is the character of the coal, the stratigraphy of the coal, the --

and the other factors that I've discussed here today.

Q Mr. Carr also asked you a question about the mathematics of making the risk factor calculation. You started with the total risk, the maximum statutory penalty of the 200 percent?

A Uh-huh.

Q Am I to understand that that was an objective, impartial analysis on your part to determine where within that range of risk from zero to 200 percent, the group collectively decided the risk ought to apply for each of these seven wells?

A (Not clearly heard.)

Q Am I also correct in understanding that you simply didn't analyze the data by which then to justify or back in to the maximum penalty.

A That's correct. Might I add something?

Q Yes, sir.

A We took, in order to come up with this, we took the information that -- that you provided us with regard to the Commission's assessing us a risk factor or not assessing us, but giving us a risk factor penalty of 156 percent in the previous hearing. We took that information and tried to follow a similar pattern as to be consistent with -- with the Commission's thinking on the subject.

MR. KELLAHIN: No further

questions.

MR. CATANACH: Are there any other questions of this witness?

MR. CARR: No questions.

MR. CATANACH: Mr. Chavez?

QUESTIONS BY MR. CHAVEZ:

Q Yes, sir. How many Fruitland Coal wells have you recommended to be drilled in this area?

A More than a hundred but less than a thousand.

Q Of the Fruitland coal wells that have been --

A And that's not me particularly. I haven't recommended those particularly. It's been the -- as a group.

Q Of the Fruitland coal wells that have been drilled and are producing, how many of them would you call geologic failures?

A That would be -- I would have to answer that the same way I answered Mr. Carr's question with respect to how many dry holes we've drilled. I can't answer that yet, because there's too many factors to consider when you consider the geologic factors that enable the Fruitland coal to produce.

Q Yes, but the geology has a portion in the assessing risk. Have you looked back at those wells and tried to make any kind of determination as to what geology -- the geology contributed to the productivity or successfulness of the wells?

A Yes, we have, and we've been at least marginally successful in re-determining the geologic potential in some areas.

MR. CHAVEZ: That's all I have.

MR. CATANACH: Any other questions of this witness?

If not, he may be excused.

MR. MEIBOS: Thank you.

PATRICK W. BENT,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Bent, for the record would you please state your name and occupation?

A My name is Patrick Bent. I'm the Regional Drilling Engineer for Meridian Oil in Farmington,

New Mexico.

Q You've testified on prior occasions before the Division as a drilling engineer, have you not?

A Yes, I have.

Q And did you participate with Mr. Meibos and Mr. Caldwell, and others, in analyzing the recommendation from Meridian to the Examiner for the risk factor penalty to be assessed in these pooling cases?

A Yes, I did.

Q Before we discuss your opinions on the risk factor, let me ask you, sir, for each of the exhibit books which I believe contain within them following Tab 5 is an AFE for each of the wells.

Did you cause those AFE's to be prepared and have you reviewed and approved those AFE's for your company?

A Yes, I have.

MR. KELLAHIN: We tender Mr. Bent as an expert drilling engineer.

MR. CATANACH: He is so qualified.

Q Mr. Bent, without going through a lot of detail and because it is not an issue of controversy in this case, let me simply ask you to take one of the exhibit books, let's pick at random Case 9593, and if you'll turn

to Tab Exhibit Five and find the AFE for that particular well.

What have you recommended and found to be your opinion with regards to the total completed well cost for that well?

A $244,400.

Q Can you describe for us, sir, what is the general range of AFE's as we go through the various exhibit books, do you recall?

A They're all in this general range of approximately $240,000, drilled and completed.

Q Describe for the Examiner how to read the information. The first page behind Exhibit Five represents what?

A The well cost estimate prepared by engineers under my supervision. It details the costs associated with drilling and completing a Basal Fruitland coal well.

Q And then page two following that exhibit number?

A Is the tangible facility costs associated with the equipment placed on the location subsequent to the completion of the well.

Q And in order for this well, in order to get the $419,000 plus, you add together the 244 under the

total drilling cost estimate plus the total facilities?

A That's correct.

Q The 174?

A Yes, sir, that's correct.

Q Have these AFE's been circulated to all working interest owners that will participate in each of the wells?

A To the best of my knowledge, yes.

Q And have you received any objection or comments from any of the parties to participate in these wells?

A No, we have not, to the best of my knowledge.

Q In your opinion, Mr. Bent, do these AFE's for each of these wells represent reasonable, accurate, and current estimates of expenditures for these wells?

A Yes, they do.

Q And would you recommend to the Examiner that the cost utilized in these AFE's be adopted by the Examiner when he issues the pooling orders?

A Yes, I would.

Q Let's turn now, sir, to the subject of the risk factor penalty. When we look at the exhibit books there is, as I showed to Mr. Meibos, a tabulation of the

risk factor analysis in any one of the books. Describe for us, sir, what role you played in the group's effort to analyze the risk for each of these wells.

A I was responsible for the assignment of the operations risk.

Q Describe for us what you did as a drilling engineer to determine that you had identified the right factors that make up the operational risk for the Fruitland coal gas wells.

A We went through the well histories area by area and determined where the problems were, the frequency of problems, the percentage of total well time that was made up by trouble time.

Q When we examine the individual exhibit books for each of the pooling cases do we find a range of percentages tabulated in the far right column or are they all 70 percent as it shows on this display I have before me?

A No, there is a range. I believe 80 percent is the highest. 70 percent is the lowest.

Q Describe for us how you determined that there was a range of risk involved in the operational aspects of the total penalty.

A In different areas there are different operational concerns. We looked at those areas where the

problems had greater frequency and assigned those areas a greater risk factor.

Q When taking all the various components of the risk factor penalty together did you find in your analysis with the group that you ever had any of these wells that in your opinion constituted a total risk factor of less than 200 percent?

A No, we did not. In some instances it was more than 200 percent but the maximum allowable is 200 percent.

Q Let's go through each of the components of the operational risk and have you discuss for us how you attempted to value for each of these specific wells the equipment failure while drilling.

A Equipment failure while drilling basically is equipment reliability. You have the normal day to day operational failures associated with rigs; a failure of clutches, pumps, hoses, that type of things. Those things don't particularly pose a threat to the productive capability of a well.

Then we looked at specialized equipment failure. Our completion technique employs some specialized equipment used in ways that are not the norm for the San Juan Basin and as such, determined those to be specialized; power swivels, air compressors, things that we found

that be more appropriate in the completion of Fruitland coal wells.

Q Why does this represent an item or a component of the operational risk for these type of wells?

A Because the failure of these type of specialized tools or the failure of these would constitute what we consider catastrophic failure in a well resulting in cessation of operations, fishing jobs, that sort of thing.

Q Have those instances of equipment failure occurred to Meridian in the drilling and completion of Fruitland coal gas wells?

A On numerous occasions, some which are listed in Eight-A, I believe.

Q Before we discuss the specifics of that information, let me make sure that your analysis is clear to everyone about the various components. You've talked about equipment failure.

The other -- the other factor under operational risk is a formation problem while drilling? What does that mean?

A That's correct. Normally when drilling to an intermediate TD we don't experience any operational problems as such. A few do occur but what I took the formation problems while drilling to be, while drilling the

Fruitland coal itself and Meridian's, one of Meridian's methods of completing the Fruitland coal involves drilling through the coal with water under balanced allowing the well to influx and we get to enlarge the wellbore creating a greater surface area, a production enhancement technique.

Q What other type of formation problems do you encounter in the drilling of your Fruitland coal wells?

A The problem basically with -- with this method is formation solids production, water production, and gas production, we have to have a method.

By drilling under balance we create a controlled blowout situation where it's necessary to use double BOP stacks, blowout prevention stacks, rotating heads, double flow lines, equipment that we feel is neccesary to control the situation.

By injecting air during the operation we again increase the solids production. We feel that this -- this procedure allows us to enlarge the wellbore and it's part of our completion technique that we feel is responsible for some of the success that we've experienced.

With this solids production there is again the risk of -- the operational risks associated with it, the bridging, shell bridging, coal bridging, lost circulation, several different factors, which make it a operational problem if it's not controlled.

Q Let's turn now, sir, to the exhibit book 9593 and look behind Tab 8. The first page is the analysis for the Atlantic B Com 220 Well. Based upon your analysis of the operational risk, what percentage of the risk factor penalty have you recommended for operational risk for this well?

A 70 percent.

Q Have you gone through a similar analysis for each of the other wells involved in the pooling case today?

A Yes, we have.

Q And you specifically looked at those operational risks as you might determine them to occur in each of those other wells?

A That is correct.

Q And then placed on that particular point in the exhibit book your assessment of percentage factor.

A That is correct.

Q Let's look now to some of the documentation that you have provided that further illustrates your point about the operational risk involved in this type of well.

There are three more areas. One is the production history on the 401 Well. Let's skip past that one for a moment.

There's the production history on the 413 Well; skip that for a moment, and go to the tabulation then which is captioned Mechanical Failure. What have you done here, Mr. Bent?

A We've reviewed the well histories basically east to west across the map that Mr. Meibos supplied and documented some specific instances of formation problems, mechanical failures, failures associated with different completion techniques.

Q And then provided a tabulation of that information.

A Yes, that's correct.

Q If Amoco elects not to participate under the pooling order and does not pay its share of the costs of the well, then that cost must be borne initially by Meridian as part of the cost of the well, to then be recovered out of Amoco's share of production plus the penalty factor that's approved by the Examiner.

Do you have an opinion as to whether or not the operational or mechanical risk applied to each of these wells is a significant element of that risk?

A Yes, it is a significant element. Even though, as Mr. Meibos testified, coal changes from area to area, so do the operational concerns and so for instance, on the first page we see some problems in the 30 and 6

area, yet these wells are further to the west. Again, with the different coal types that we encounter, we encounter different operational concerns and so everywhere we go there are substantial operational risks involved.

Q If Meridian undertakes to assume that risk for Amoco's share of the interest in these wells, is that a risk that ought to be compensated for in a risk factor penalty?

A Yes, it is.

Q Let's turn now, sir, to the production history on the 413 Well, if you will. Describe for us what's shown on this exhibit.

A This is a gas/water production form approximately mid-year 1986 through the present -- excuse me, '87 through present, and what it shows is a marked decrease in the production of the well.

Let me give you a little background. Once a well in this area, or this type of well, has been completed, we run a liner. The procedure we use to run these liners is determined on a well by well basis; that the volume is low enough of gas produced and the water production and solids production is stable enough we're able to strip the liner in the well.

If the gas volume and solids production, water production, is substantial, we have to snug the liner

in the well and in certain instances where it is unable to do either, we have to mud the well up and kill it. We feel at this time that any weighted drilling fluid across the formation is extremely damaging to the fracture system associated with the coal production, gas and water production.

What happened on this well was that it was drilled and completed with a minimum amount of problem but in the producing life of the well the casing suffered a catastrophic failure. We were -- had to work over the well to repair the casing, and in doing so we had to mud the well up and kill it, using a low solids, nondispersed mud system, approximately 11 pound per gallon mud. In order for us to be able to do this we lost approximately 2000 barrels of whole mud to the well. Once we did kill the well we were able to repair the casing, brought the well back on line and it never has produced -- the initial production rate or the producing rate at the time of (unclear) was in excess of 10-million a day. Now, due to the loss of mud and what we feel is the damage associated with that loss, the well produces somewhere in the vicinity of 500 MCF a day.

Q Let's turn to the example shown on the production history tabulation just before the 413. Let's turn to the 401 Well. Describe for us the well history on

that well, Mr. Bent.

A This is one of the initial wells in our pilot program drilled in 1986. This well was drilled to TD and casing run through the Fruitland coal. The well was cemented, selectively perforated, fractured, sand/water hydraulically fractured. It is one of the lesser or least productive wells in the 30 and 6 Unit. What it's showing is that -- that we tried several different techniques in order to bring the well around to enable it to produce like the offsets, some of the other wells in the 30 and 6 Unit we had sand/water fractured, as I've stated; nitrogen injection, we blew the well with air, gas, tried several different things with really no success at all. Once we did leave it alone the production rate did rise slightly up to approximately 500 MCF a day. Currently it's producing just about 300 MCF a day. It's an example of a well that completion technique used didn't fit the well. We have to look at each well on an individual basis in order to complete the well, I think, as successfully as we possibly can, and this is an example of not doing very well at that.

Q The general period of time involved in the treating and work on this well is from '87 through '88?

A From mid-year '86 to the present.

Q And what is the current rates on that well?

A It appears to be somewhere around 2-to-300 MCF a day.

Q And what was the highest rate on that well during the life of the production?

A Standard production appears to be somewhere around 500 but only for a short period of time. I think the average would run about 350.

Q This well was being operated by Meridian during the period of time that you had a basis of information from prior Fruitland coal gas wells that you were drilling and producing?

A Very little information at the initial stages of the well. Again, in 1986 we drilled 4 Fruitland coal wells; '87, we drilled 16, and as you can see, most of the work was done in late '86 or '87. Our data base at that time was not as substantial as it is now. Again I think one of the points here is that -- that depending on the area we have to look at each well individually to determine the completion technique and again there's a risk involved with inappropriately completing a well using a method that's not suited to that area.

Q Even with Meridian's basis of expertise and knowledge about the drilling the Fruitland coal gas wells, is there still the element of risk associated with operational risk that you've assigned for each of these

wells?

A Yes, there is. One of the things that we do to give the well a chance, again, to perform, is in some of the outlying areas we've drilled through the Fruitland coal with water and allow that well to be given a chance to show any signs of gas production prior to, say, running casing across the Fruitland coal and maybe hydraulically stimulating the well. That's all.

Q In conclusion, then, the element of operational risk you've assigned for each of these wells is shown the summary of information behind Tab 8 in the exhibit book?

A That's correct.

MR. KELLAHIN: That concludes my examination of Mr. Bent, Mr. Catanach. We would move the introduction of information shown in the exhibit book behind Tab Exhibit Eight in each instance.

MR. CATANACH: Okay. Did you already offer a portion of your exhibits --

MR. KELLAHIN: We already did, yes, with Mr. Meibos.

MR. CATANACH: Okay, that portion of Exhibit Eight in all of these cases will be admitted as evidence.

Mr. Carr, do you have

anything?

CROSS EXAMINATION

BY MR. CARR:

Q Mr. Bird, if I understand your --

A Bent.

Q Mr. Bent, I'm sorry. We always screw up the hard names.

Your responsibility is assigning a percentage risk for operation risk, is that correct, in these -- in the cases we're looking at here today.

A That's correct.

Q And those figures, based on your recommedation, have varied from 70 to 80 percent, is that correct?

A That's correct.

Q Could you tell me what kind of a problem would have caused one well to have an 80 percent factor as opposed to a 70 percent given to others?

A Right.

Q I don't understand what you base that 10 percent differentiation on.

A I think -- well, what we based it on was the completion technique that we felt would be most applicable for the certain well and in that completion technique

there are higher operational risks involved in certain wells than in others.

Q So some completion techniques have a higher risk than others.

A That's correct.

Q And when you use those you would kick up the operational risk category.

A That's correct.

Q These completion techniques that you use, are they commonly used by operators in this pool or are they unique to Meridian?

A The higher risk completion procedures is a Meridian developed technique, although other operators are moving towards that.

Q How many wells has Meridian drilled to this -- at this point in time in the -- in this pool?

A Total wells in a 3-year period are 201.

Q Have you been involved on a number of those?

A 201.

Q Are you getting better at controlling the problems relating to the completion techniques?

A We're learning more. We're having to develop new tools, modified tools, that sort of thing. Each different area we move into we encounter different

types of problems, but on an area to area basis we're learning.

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

MR. CATANACH: Other questions of this witness?

If not, he may be excused.

Let's take a break here.

(Thereupon a recess was taken.)

MR. CATANACH: Okay, we'll call the hearing back to order and I will turn it over to Mr. Kellahin.

MR. KELLAHIN: Mr. Examiner, I'd like to call Mr. John Caldwell

JOHN CALDWELL,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Caldwell, for the record would you please state your name and occupation?

A My name is John Caldwell, C-A-L-D-W-E-L-L. I'm employed by Meridian Oil in Farmington, New Mexico, and my title is Regional Reservoir Engineer.

Q Mr. Caldwell, on previous occasions have you testified as a reservoir engineer before the Division?

A Yes, sir, I have.

Q Describe for us generally what it is that you are addressing with regards to the risk factor penalty portion of the compulsory pooling applications that are before Examiner Catanach this afternoon.

A Specifically the portions that I plan on addressing today are reservoir risk associated with the risk factor penalty and economic risk.

Q Have you and the staff engineers that work for you with Meridian Oil, Inc., performed the necessary engineering analysis to allow you to reach an opinion about the risk factor penalties to be applied to each of these wells?

A Yes, sir, we have.

MR. KELLAHIN: I tender Mr. Caldwell as an expert reservoir engineer.

MR. CATANACH: He is so qualified.

Q Before we discuss the individual wells,

Mr. Caldwell, let me for reference show you a copy taken from any of the exhibit books of the first page following Exhibit 8, and as we've discussed with the prior witnesses, let me direct your attention, sir, to having you identify and describe for us the method by which the study group attempted to define issues that encompass the risk factor penalty and then subsequently what role you played in that study group.

A Okay. In essence the reservoir engineering staff, Pat Bent of the drilling engineering group, and Lynn Meibos of the geologic group upstairs in our office, decided that we needed to address the appropriate parameters that went into calculating the necessary risk factors for the Fruitland coal forced pooling cases that we have in front of us today.

Some of the things that we wanted to address were more detail associated with each of the three or four parameters that we talked about previously, and my charge, really, as a president pro tem, whatever, of the group, was to try to come up with the appropriate risk factors, geologic, reservoir, economic and operation.

Specifically the way Meridian's office is styled, they have a separate engineer in the reservoir group that each works a particular area. Of the eight wells that we're originally planning on pooling today,

Three separate reservoir engineers that work for me covered those particular wells. I asked them to sit down and get their heads together on the differences and the similarities in assigning risk between each of their particular areas in each of their coal wells as pertaining to reservoir risk and economic risk.

And some of the things that they came up with and I came up with are listed on each of these exhibits under risk penalty analysis.

Q For definition purposes, then, Mr. Caldwell, will you identify for us under reservoir risk what is intended to be meant by sustained deliverability and how that parameter applied to the risk factor calculation?

A One of the things that we looked at was sustained deliverability. That, in essence, can be defined as what type of rate are we getting from the wells that have been drilled, completed, and tied into the line. Along that line we've drilled a number of wells that have not been tied in. The Exhibit Seven-E that Lynn and I prepared reduces that data to a visual exhibit where you can graphically see juxtaposition, I guess. if you will, of the rates as opposed to the wells that we're planning on force pooling.

One of the things that's very important to us is economics, naturally, to program it we're drilling

the Fruitland coal, and we're very interested in finding out what rates are, what rates are we getting from the wells that we're drilling.

Exhibit Seven-E addresses the rate variability that Lynn has mentioned that can be directly correlated in essence with permeability.

We feel that well rate performance exhibited on that exhibit, which is a 30-day sustained deliverability number in MCF per day for each of the particular entities up there, is not sensitive particularly to thickness of the coalbed. It is sensitive to permeability.

As permeability is not an easily mappable parameter, we'd like to look at the distribution of rates associated with the wells that we have drilled and tied in to see if we can make some correlations. I'm not sure that there is a correlation. We haven't been able to detect a particular parameter that we can put our finger on to get to that point.

Q Because of your inability to do that, did you assess a higher portion of the reservoir risk then to the fact that you could not predict the performance or deliverability of particular areas, if any, to be drilled?

A Yes, sir, that's correct. If we had offset production data that indicated a relatively high degree of confidence we'd get an economic well based on in-

itial potential or based not on initial potential but on a 30-day deliverability averages. We felt more comfortable about drilling a well in that proximity, as I think probably most people would. Unfortunately, of the eight wells that we're talking about only one well can be used as relatively low risk based on rate.

Q You also identified as a topic under reservoir risk the subject of dewatering. Would you describe for us how that plays a part in the analysis?

A Yes, sir. Dewatering as it relates to risk is -- is -- can be explained, I guess, again as a function of cleating. Dewatering a highly cleated reservoir will give you high rates of water but low or TSTM rates of gas per some period of time.

In other cases in some of our wells we've got water cuts up in excess of 1000 barrels of water per million. In dealing with disposal water costs, that's not economic to us if we were making 5, 10, 15 MCF a day.

In other cases the water cut is much lower than that and we can tell a lot quicker in the well's life whether or not we have an economic venture.

We have some wells that we're convinced are going to be economic but we don't know when or how and we have some that we think we can tell in six months production time that they might be economic and we have some

wells that we don't know, and the dewatering risk is drilling a well in an area that we know has permeability and cleating and maybe not getting a successful economic venture.

So all of that is rolled up, I guess, in the dewatering aspect of reservoir risk. How long will it take us to get economic rate, a month, a year, five years, maybe never, and even though we've got demonstration of high permeability in the coal, do we have any -- any gas production?

Q And those are all elements of the risks that do not in your opinion have a comfortable handle on that you can make accurate projections and thereby minimize your risk.

A Yes, sir. We drilled wells that have tested at high water rates and high gas rates and tied them into the line and have not seen those types of water rates or gas rates.

Q Let's turn now to the reservoir recovery aspect of the reservoir risk and have you explain and describe what that is.

A One of the things I think most companies do when they decide whether or not a particular well is economic or not is take initial potential or take the first 30 days deliverability and do some kind of extrapolation to

come up with reserves. They run some type of internal in-house economics to see whether or not the venture that they've been sold by their staff is really such a good deal after all and they come up with a projection as to whether or not they want to drill some more of these wells.

One of the problems that arises when you're drilling an unconventional reservoir, like the Fruitland coal is, you can't tell from the initial rate what the well performance is going to be. You can't tell in our experience from a flow test before you tie the well and what the well is going to perform as. Based on the behavior of inclining rate with time and the dewatering mechanism and a non-linear pressure versus cum performance, we can't tell if the 25 MCF a day is eventually going to end up to be 2-million a day or if it's going to be flat at 25 MCF a day, or in fact it's going to decline at some number. We have some pretty good ideas but there's definite reserve recovery and undefined producing coal characteristics that play a big part in assessing reservoir risk. This isn't a traditional reservoir by any means and to assign -- to assign a risk knowing that we know how the reservoir behaves is not appropriate here.

Q Discuss for us now the issue of economic risk and how is that integrated into the other risks.

A Well, as I mentioned, I guess, briefly

earlier, everything boils down to the bottom line in our company and I'm sure it probably does in others, too, and what we need to be thinking about are the economics associated with the project that we're drilling and some of the economic risks that go in to our evaluation are not typical in the Fruitland coal as they are in some of the other formations in other parts of New Mexico and other parts of the San Juan Basin, and we've tried to lay out for you some of the items that we feel we need to spend money on and we're taking a risk on to make the whole thing profitable, and those are laying a completely separate CO_2 gathering gas pipeline system and treating plant; drilling SWD wells at some risk to take care of the high volumes of water; all of those associated expenditures with treating the produced fluids and marketing that gas. There are a lot of risks associated with the Fruitland coal and in essence, in my mind, indicated it's a wildcat play. I think Lynn alluded to that a little bit earlier when he said that it's an AAPG shallow pool test in most areas, and we really feel that way even though we've got 10,000 control points, what we're drilling here is a wildcat play, and I think the risk needs to be appropriate to that.

Q Let's talk about where Meridian is in the current state of drilling activity, your plans for drilling. Up to this point you have been drilling what

type of prospects, geologically? Is there a particular pattern? Have you taken the lowest risk areas first to drill or have you taken those areas and where you have the greatest percentage interest ownership of that well, or how have you organized your scheme or plan of development for all these wells?

A We've tried to be reasonably even-handed for a variety of reasons. Initially the way that our program started we wanted to drill on 100 percent acreage because we couldn't get, we felt, any partners to approve the research effort that we were doing on the 4-well pilot program.

We spent over a million dollars per well on those 4 wells and some of those wells are not economic ventures. Based on the results of playing around with those 4 wells, we proposed 16 wells to be drilled in 1987 in areas that we'd identified as being high potential, 100 percent drill blocks in most cases; I think in all cases.

Based on those results, which we do have some production data now that's a year to 18 months, we proposed a third phase, if you will, for 1988 that involved the acreage that we felt was high potential both operated 100 percent drill blocks, 100 percent working interest, and partner wells. Those wells were proposed primarily I think in April of 1988 and by virtue of -- of being able to get

consent on 100 percent wells, we drilled those preferentially.

The rest of the wells in what we consider the high potential areas, we've had a difficult time gaining consent or some type of election from our partners on. Feeling a little bit frustrated by that and also wanting to maximize our acreage position and find out really what the Fruitland coal resource was out there, we stepped out and optimized on 100 percent drill blocks that we could drill early to see what in essence our -- the value of our acreage was in outlying areas.

So now what we have is we have lower, less than 100 percent working interest prospects, if you will, being drilled at the same time as we're drilling higher risk outpost type prospects in the outlying regions of the basin. We're drilling both plays right now.

Q Within what group of activity do the current group of six pooling cases find themselves, Mr. Caldwell?

A These six cases we're talking about today lie in our originally identified high potential area and they've been on our books since April and they've been a project we've wanted to drill since early last year.

Q In studying of assessing the risk factor penalty describe for us your opinions with regards to the

risk of these wells as they relate to the maximum 200 percent risk factor penalty.

A I'm sorry, could you rephrase that?

Q All right. I want to focus in on the maximum 200 percent risk factor penalty with regards to these particular eight wells, all right?

In the group's analysis of that risk factor, what has -- what is the conclusion as you can express it for the group concerning that penalty for these wells?

A The penalty was derived independently of the 200 percent maximum and we felt constrained, naturally, by the 200 percent maximum. We came up with some numbers in some of the high potential areas of a lot of operational risk, a lot of watering risk, with numbers that were way in excess of 200 percent. I don't have those numbers handy. We felt he had to proportionately reduce them to -- to tie the 200 percent maximum, when the issues that we looked at drove us up to 300, 300+ percent penalty on top of that. I don't know if that's inappropriate.

Q The Division is allowed to assess a penalty for the drilling and completion of the well that you undertake on behalf of Amoco for their share of the cost of that well and says, which charge for risk shall not exceed 200 percent of the noncensenting working interest

owner, or owners, prorated share of the cost of drilling and completing the well. All right?

A Okay.

Q Does the geologic risk that your group discussed fall within the concept of the risk involved in the drilling and completion of the well?

A You mean does the geologic risk that Lynn has assigned double dip, if you will, operation risk on completion?

Q Yes.

A No, it does not.

Q Okay. When we look at the reservoir risk assigned and the penalty then to be recovered for the risk undertaken for drilling and completing the well, is this a reservoir risk that applies to that activity?

A Yes, sir, that's correct.

Q And with regards to the complete -- the economic risk involved, are those items that specifically involve the risk in drilling and completion of the wells?

A Yes, sir, that's correct.

Q When we look now to -- when we look to the operational risk, those are operational risks involved in the drilling and completion and stimulation of the well?

A Yes, sir.

Q When we get down to a study of the indi-

vidual wells can you summarize for us, if we go through the individual wells, and tell us what were some of the major parameters that influenced the group's decision to recommend the maximum for that particular well?

A Certainly.

Q For example, if you'd start with the 9593 case, that's the Atlantic B Com 220 Well?

A Yes, sir.

Q Summarize for us what is your opinion and conclusion about the risk factor penalty for that well.

A I don't want to drag this out any longer than I have to but I'm going to step up to Exhibit Seven-E if I could.

Q Okay.

A Case 9593 deals with the Atlantic B Com 220 Well, which is located in Section 34, 31, 10. The risk that we associated with the first part of that, rate risk, reservoir risk, we gave it a high risk to rate because the closest offset well that we have any data on is in Section 1 of 30 and 10, and that number is 81 MCF a day and that's after stimulation. That's a 30-day number and we feel -- we've drilled all of these wells in this area that are TSTM, and this one is going to do better than that one but we don't know. Our rate risk in this particular area is a wildcat and it's a low, uneconomic well that we're compar-

ing it to. We've got some coal thickness but for purpose of our risk analysis, it's a very risky venture.

We gave it a low risk for project because this is going to be lying right along the trend of some of our pipeline work that we're already doing throughout the lease to take care of some of these associated problems with water production and maybe not going to have a lot of water, 5 barrels per day. That piece of a risk package we gave a low number. I can't really speak for the operational risk for that. we gave (unclear). I can't really speak for the operational risk for that.

Q In conclusion, then, do you recommend the maximum 200 percent penalty for that particular well?

A Actually, I'd recommend higher than this if we could go higher because that's a pretty risky well. We felt constrained at the 200.

Q Let's look at Case 9594. That's the Florence 260 Well?

A Yes, sir. The Florence 260 is located in Section 21 of 30 and 9. This happens to be an area where the plot of the operated production data came from the Florence leases which have been recompleted over time. Our closest offsets are several Tenneco wells operated, I think, by Amoco now that are 30-day (unclear) drilling in the order of 100-to-150 MCF a day. To us that indicates

the possibility of hydrocarbons. It doesn't necessarily indicate the possibility of drilling an economic well.

What we gave that was a high risk for rate. I think it's probably a little bit lower than this but we gave it the same number as the Atlantic B 220 because we couldn't go any higher in the Atlantic Well, and we gave it a low, relatively low risk project because in this area there's a lower CO_2 concentration and we feel it's going to be lower in water production and those associated risks are going to be relatively smaller because of that.

Q In conclusion, then, with regards to the Florence 260 Well, what is the collective opinion on the risk factor penalty for that well?

A We wanted the maximum on this and I think that's probably appropriate, whereas the other one was maybe higher than 200 percent, this one would probably be closer.

Q Let's go to Case 9595, which is the Caperton 310 Well?

A Yes, Caperton 310. That well is located in Section 32 of Township 30 and 8, 30 North, 8 West. As you can see, we're closer to the 30 and 6 unit; (unclear) this (unclear) Township 30 and 7 and Lynn's Howell J Com 301 Well is represented on the exhibit. I believe it's in

Section 14 --

MR. MEIBOS: 11

A Section 11, I'm sorry. Our closest production data is the well that we've had on line for several months; the first 30 days averaged 340 MCF per day with relatively small amounts of water, 5 or 10 barrels per day. That well is currently making 200 MCF a day and about a 20 percent decline. We're not convinced that's an economic venture, although (not clearly understood.)

The other closest well offsetting it now is an operated well, averaged 15 MCF a day. Even for a traditional well that's uneconomic.

The other two key wells, we have one, a well in Section 34 that's 57 MCF a day and that well, I believe, (unclear) over a million a day and tied into the line at 500 a day, and the first (unclear) average was 57 MCF.

The key point here is that the Caperton, we associated a high risk for rate because we have no analogs that say that any of the wells that we drill in this area are going to be economic and we associated the low risk for project because we felt that the water was going to be higher than some of these other wells, was still going to be relatively small economic risk associated with taking care of all the project's

(unclear).

This well in Section 35 is another one of our wells that IP'd at 7-million a day, I believe, and it's producing about a million and a half a day from the Fruitland.

Q What's your conclusion, then, about your recommendation for a risk factor penalty for the Caperton 310 Well?

A Our conclusion was that this was -- this well should be higher than 200 percent nonconsent again because we have no -- no basis for judging otherwise.

Q Let's go to the 9596 well, the Pearce 250.

A The Pearce 250 is located in Section 7 of Township 30 North, 9 West. Again the analog that we're using based on actual performance is the same one we've talked about, the Atlantic B Com 220, with 81 MCF per day. Therefore we gave it the high risk for rate and low risk for project for the same reasons.

Q And your ultimate recommendation, then, is what percentage with respect for that well?

A This -- this well we feel a little bit better about because it is only a mile and a half away from -- from an uneconomic well that's making some gas,

but it's still a risky venture.

Q Representing in your opinion what percentage risk factor penalty?

A 200 percent.

Q Let's go to the Delhi 300. It's Case 9597? Find that well for us.

A Yes, sir, the Delhi Com 300 is located in Section 16 of Township 30 North, 8 West, and again in looking at the actual production data of the wells around it, we have the same well that we talked about in the Caperton case in Section 27, 30 and 8, which has averaged 15 MCF a day and in our mind is uneconomic.

Meridian has a well in Section 15, the Howell K 300, which the first 30 days have averaged 111 MCF a day. This well flow tested over a million a day and the initial after frac, after drill rate was 400 MCF a day and it came on line at 170, a 30-day average.

We have some offset wells in Section 10 that are zero; in Section 4 that are zero; in Section 3 that are 75 MCF a day, all of which are uneconomic.

On the up side of this is where there's an area of thinner coal we have higher rates. We do have some 100 to 200 MCF a day analogs.

The bottom line of all of that for the Delhi was we gave it a medium risk, if you will, for rate

and a low risk for project. This is in an area that we're trying to develop and drilling reasonably elaborate gathering facilities and we've got an SWD well that's located not too far, I'm not sure what section it is, but it is in Township 30, 8.

The bottom line of all of that is that although it's not as risky for the project basis, it is risky from a rate basis. There's only one -- one well that's economic in our mind out here; possibly two, and we gave it the maximum.

Q 200 percent penalty.

A 200 percent penalty.

Q I direct your attention to the well for Case 9598. It's the EPNG Com A 300 Well.

A Yes, sir.

Q Describe for us your analysis of that well and your ultimate conclusion about the risk factor penalty percent.

A The EPNG Com 3-A 300 Well is located in Section 32 of Township 31 North, 8 West, and we like this well. This well has got an analog production history around it on three sides that show 780 MCF a day in Section 33; 900 MCF a day in Section 29; 840 MCF a day in Section 5 of Township 30 and 8. Those are the good wells.

The bad wells are two wells we drilled

that are TSTM in Section 31 and Section 28; an offset operated well that's averaged one MCF a day; another one that's averaged 89 MCF a day; and several down in Section 5 and 6 of 30 North, 8 West that have averaged 100 and 200 MCF a day.

The bottom line of all of that is we gave it low risk for rate. We felt we could drill a well that would probably be economic ratewise.

We gave it a high risk for project because this is an area that typically exhibits high water production and causes a lot of problems in handling that water. We try to -- we feel that there's a very good possibility we'd get some cleatings and permeability but also high water rates. It may take awhile to find out whether this well's going to be an economic venture.

Q Do you have difficulty with your wells if they're shut in and they're subject or vulnerable to having that gas production cease as a result of the water influx into the wellbore?

A Well, I think Pat testified about the 413 Well, what happens if you have to mud up a well, you lose it, We lost a 10-million cubic feet of well -- MCF per day well by having to kill it. We feel that some of the same problems could happen if we have to start dewatering the Fruitland coal and we have to shut it in at

some point in time. We feel there's a very definite risk there. It varies by area. One of the things that we mentioned is a dewatering risk. How do you address the economic consequences of getting a well on, getting it tied in, and then having to curtail or shut it in? We feel in some areas, and this is one of them, we may lose a well like that.

Q And you might lose that well at a time prior to it recovering its cost one time?

A Most definitely.

Q What then is your ultimate conclusion about the risk factor penalty for the well for Case 9598?

A 9598, there's a lot of risk associated with -- with the project, as I mentioned, and we ended up giving it the maximum. This was one of the wells, I believe, that also bumped over that 200 percent.

Q All right, finally, let's go to Case 9599. It's the Stanoline 300 Well.

A Okay, the Stanoline 300 is located in Section 16 of 30 North, 8 West, and in analyzing this particular proposed well it's very similar to what we've already talked about the Delhi Com 300. The offset performance, the closest well is an outside operated well in Section 10 that averaged zero for the first thirty days, and we have another well that Meridian's drilled, the

Howell K 300 in Section 15, that averaged 111 a day. Both of those are uneconomic wells.

We have a well down in Section 27; again it's 50 MCF a day. The up side to it, to this particular well is we're not too far from Section 5 and 6 where we're getting 100 and 200 MCF a day and one well that's 840 MCF a day.

The bottom line of that is we gave it the same risk assessment as the Delhi 300, a medium risk for rate, although that's probably -- probably stretching a little bit in that particular well, and a low risk for project because we felt the cleating and the water associated with all that would not be quite so high.

Q What percentage penalty did you assess for that well?

A This well we gave 200 percent.

Q Thank you.

MR. KELLAHIN: That concludes my examination of Mr. Caldwell, Mr. Catanach.

MR. CATANACH: Mr. Carr?

CROSS EXAMINATION

BY MR. CARR:

Q Mr. Caldwell, I believe it's within your area to look at, as I think you indicated, sustained

deliverability.

A Yes, sir, that's correct.

Q In doing this are you called upon to look at initial rates and see how long it takes for them to reach a peak rate, a well to reach a peak rate?

A We've done a lot of work in that.

Q Has that fallen within your area?

A Well, it's kind of an inter-disciplinary effort between my group and the reservoir department and the production group.

Q Is it possible to relate with any accuracy initial rates and what the well's peak rate will ultimately be?

A We haven't been able to.

Q Have you been able to make any estimate as to the times that are required for a well that actually reaches a peak producing rate?

A We've been asked that question repeatedly by our management. One of the answers that we try to look at is what's happened in the basin with some wells that have some history and Amoco's Cedar Hill is one of the things that we fall back on.

One of the problems with that is the coal, as Lynn mentions, varies tremendously across the basin. I don't think you can use the Cedar Hill as an

analog for Township 30 North, 10 West, because the coal behaves completely differently, we feel.

So what that affects is the distribution of permeability affects your initial rate, which affects your water production, which affects your timing, if you will to reach a peak rate, and probably your ultimate recovery and your ultimate decline rate, and your decline rate may be 50 percent, it may be 10 percent, we really don't know and some of the stuff that we've looked that Amoco has drilled and operated, shows inclining performance over 7 years, so maybe that's reasonable, but maybe it's not. We've got a well, like I mentioned, that's declined from day one at about a 25 percent decline rate.

Q And do you have an opinion as to what has caused that in that well?

A In that particular well?

Q Uh-huh.

A We've got several opinions and I've got several opinions and I'm not sure what the right answer is.

Q Are they related to just the reservoir itself or --

A Yeah.

Q -- are some related to completion --

A Yes, sir.

Q -- or producing techniques?

A That particular --

Q Or both?

A That particular well we completed open hole. It's the Day Com 200. We completed that well open hole and tested it as too small to measure.

We ran a liner and cemented it and treated it with one of our first fracture stimulations and we got what we felt was very encouraging results of 450 MCF a day on an after frac date. We tied the well into the line. We got 300 -- I'm sorry, I'm kind of speaking from memory now, about 400 MCF a day; initial deliverability into the line at 350 pounds back pressure. From that point the 30 day average was 348 MCF a day and currently it's making about 200 MCF a day, and the only explanation I can have is maybe we didn't stimulate it correctly and maybe the coal was behaving differently, and maybe we haven't opened up maybe all the reservoir; maybe it's not there, and there's a lot of risk associated until we -- one -- one of the things that I know has been testified to in the literature is some wells maybe decline for awhile and increase to a peak and then decline from that point on. We've seen, maybe, some of that behavior in some of Amoco's production. We have not seen it ourselves.

The well could decline to depletion or

-- we don't know.

Q When you say -- when you go out and run an initial test on a well, is it -- and it sound to me from your testimony that you have on fairly frequent occasions had volumes too small to measure, when you get that, what techniques are available to you to -- to enhance that well's ability to produce?

A We've probably tried with maybe several exceptions everything that we can think of, and I think when Pat talked about the 401 Well, and we can talk about that, if you like, that well has had over 20 different stimulation jobs done on it and we've acidized it with hydrochloric acid, 50,000 gallons. We've fracture stimulated with sand/water frac of 150,000 pounds of sand. We've nitrogen foam fraced it twice. We've acidized it, acid washed it four or five times. We've gone in and jetted it. We've tried lots of different tools, lots of different techniques, and we've been pretty disappointed; the well just got worse, kind of like the sick patient that almost died.

Q And is languishing?

A It's languishing now.

Q When you used these various techniques on other wells, have you been able to improve their producing capabilities?

A The Day Com Well that I mentioned we improved from too small to measure to 450 MCF a day.

Q Throughout the testimony today was -- we keep hearing about a number of wells that are not tied in.

A Right.

Q Why is that?

A Our sister company, El Paso Natural Gas, has chosen to take its time in tying in our wells. Contractually we're limited to a certain percentage of CO_2 that we can dump into the system, as I'm sure Amoco is probably aware of. Due to the fact that we have to have arms length negotiations even with our sister company, they put us at arm's length plus across the room, and that's caused some problems.

We have permitting problems in laying our own gathering system. We're trying to build a 170-million a day CO_2 treating plant in the basin and we're trying to sign up outside parties to see if we can handle their CO_2 treating problems in their gas stream.

Logistically it's just a tremendous project in trying to lay a duplicate gathering system for the Fruitland coal.

Q How -- one of the earlier witnesses told me how many wells you had at this time drilled into

this pool in the basin, in excess of 200?

A 201.

Q And of those, how many are not tied in or how many are at this time?

A We've tied in our original 20 wells, which is 4 wells '86 and 16 wells in '87. From that point I believe we've probably tied in another 25 wells.

Q So less than 50?

A The number at my best recollection was 44, so --

Q Of 200 and --

A 201.

Q Of the 44 that are tied in, in your opinion have any or many of those wells reached their peak producing rates?

A I think a handful may have. Six, in that range but less than half of them are. It's a little bit anomalous because the 20 wells that we drilled in the pilot program and the other 16 are in a very prolific area. Of those 20, 8 are declined, so 12 are still flat or inclined.

Q In terms of their reaching their peak rate, did they do it in a similar time frame or did they -- were there variations in that aspect of the well's producing characteristics?

A I don't think any of them were the same. Some of them are flat. Some of them declined and then inclined based on some of the work we were doing. Some of them we stimulated too much that they declined from day one.

Q Now when you're looking at wells, from your testimony I gathered that you made judgment calls as to whether a well was high risk or less risk looking at off-setting properties and offsetting wells, is that correct?

A That's one of the parameters that we used.

Q And that's something that you would use even though your geologist would discount that.

A One of the dichotomies, I guess, between geologists and engineers is engineers like to use closeology regardless of what the geologists tell us. That causes some problems, obviously, inter-disciplinarily, but on Lynn's Exhibit Seven-C you can readily see that even the same coal thickness gets widely varying results.

What we're trying to do is determine in our own minds what's the behavior going to be of that particular well based on what we've seen in the first 30 days, and we've got our own ideas that we sell management

on, on how those wells are going to perform, but we've got to tie it back to reality and it's some discrepancy there.

Q And when you're involved in making recommendations to your management you look at data on the offsetting properties in making your decisions as to what you're going to recommend?

A Yes, sir, we do.

Q Is it fair to say that where you have more data you can make more accurate prediction as to the caliber of the chances of success for the prospect?

A We've indicated that slightly in our risk analysis but I could give you an example just north of Cedar Hill where we had two wells side by side and one well with 3-million a day and one well was TSTM, and that --

Q Because of the reservoir or other factors?

A Because of the reservoir.

Q Okay, by the same operator?

A Meridian drilled.

Q When you talk about the water cut effects on the economic life, there are wells that you operate that you've concluded are simply non-economical because of water production, is that right?

A I think that Lynn expressed it as well

as could, really, we don't know, and there's a lot of risk associated with how many of the 201 wells that we've drilled to this point are going to be economic successes.

Q And that's going to require production first, is it not?

A Yes. We have several wells that are making in excess of 5000 barrels per million.

Q Now, in terms of the portion of the risk factor that was your responsibility, if I understood you, you also looked at economic risks, and when you look at economic risk you include the treating facility, the separate line, the disposal wells, all of that, is that correct?

A One of the things that we have to justify to ourselves is a certain economic parameter be met and for us to be able to meet that, whether it's net present value, rate of return, whatever it is, you've got to be able to sell the gas. We can't sell the gas because we can't handle the water or we can't sell the gas because we can't handle the CO_2, that has a direct impact on that present value. If it's two years before we can get a CO_2 plant up and running, it may be an economic well if you were to tie it in tomorrow, but it would be uneconomic if we had to wait two years, and so projects risk doesn't include on a discrete basis including all the capital costs

associated with drilling an SWD and laying all the lines but it does associate with the timing of when you're going to actually produce the well.

Q And those matters, though, are factors that you include, is that what your testimony was?

Now, during your direct testimony you talked about all of these wells being in what you called your high potential area. Would you -- what is your high potential area?

A I think the high potential area has probably been defined in the literature as eloquently and probably a lot more eloquently than I am today. In essence what that is is a trend line between Cedar Hill with established production and established fracturing trend from 30 and 6, which has established production and established fracturing trend.

Early on in our program what we wanted to do was connect it on and optimize our acreage within that corridor, that fairway, or whatever you'd like to call it. Unfortunately, a lot of our acreage doesn't lie in that fairway and what we chose to do was drill some selected wells to see what our results would be. Our results have been all over the map. We've got great wells. We've got a lot of TSTM wells.

Q Okay, that's all, thank you.

MR. CATANACH: Anything further?

MR. KELLAHIN: No, sir.

MR. CATANACH: The witness may be excused.

MR. KELLAHIN: Mr. Examiner, we'd call Mr. John Myrick.

JOHN MYRICK,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A John Myrick. I'm a landman for Meridian Oil in Farmington.

Q Mr. Myrick, have you testified before the Oil Conservation Division on a prior occasion?

A No, sir, I haven't.

Q Would you summarize for the Examiner what has been your educational and employment experience as a petroleum landman?

A I have a Bachelor's degree from the Uni-

versity of Texas at El Paso, 1974; JD degree from Texas Tech University in 1977. I've been employed with Meridian Oil and its predecessor, El Paso Natural Gas, El Paso Exploration Company, since 1978 as a landman; first in the El Paso office as a contracts and titles landman and from '85 on as a field landman.

Q Have you familiarized yourself with the process by which you negotiate with other working interest owners and attempt to form voluntary spacing units for the drilling of the Fruitland coal wells?

A Yes, sir, I have.

Q In each of the cases that's before the Examiner this afternoon, have you participated in and compiled the necessary land information for those wells?

A Yes, sir, I have.

MR. KELLAHIN: We tender Mr. Myrick as an expert petroleum landman.

MR. CATANACH: He is so qualified.

Q Mr. Myrick, let me take the case book for Exhibit 9593 and let's go through the exhibits.

First of all, behind Exhibit One what do you have?

A We have the application for compulsory pooling.

Q Okay, attached to that application, then, is a plat showing the well location and the spacing unit for the well?

A Yes, sir, and behind that is the parties that -- a list of the parties (unclear).

Q Let's turn to Exhibit Two now. What's shown here in the exhibit book?

A This is a general plat of the area showing the proration unit for the well under consideration and the location of the well, the offsetting acreage, offsetting sections, offsetting owners.

Q And behind that landman's plat of the general area --

A Is a more specific plat of the unit itself, where we plan to drill the well, showing the location of the well; leases are described; owners of the leases; acreage attributable to each lease.

Q All right, sir, and when we turn to Exhibit Three, identify and describe the information contained behind that tab.

A This is -- these are copies of letters that we've sent out to the other owners in the well in an attempt to get them to join in the well, make a commitment one way or the other in the well.

Q Okay, then when we turn to Exhibit Four,

what's behind that tab, Mr. Myrick?

A On the first page is a list of owners showing their percentage interest in the well and showing what they have done so far in regard to joining the well, showing whether they've signed the AFE or whether they've signed the operating agreement, or both.

Q For this particular case we have 12+ percent working interest for this spacing unit that at the time this was prepared was controlled by Tenneco Oil Company?

A Yes, sir.

Q And as of the date of this hearing we have neither an AFE nor a joint operating agreement signed.

A That's correct.

Q Now, the Tenneco interest to the best of your knowledge is under the control and operation of what company?

A Amoco.

Q And have you and others on behalf of Meridian dealt with representatives of Amoco concerning each of the interests that were formerly held by Tenneco in each of the forced pooling cases involved here?

A Yes, sir.

Q All right, sir, and then after Exhibit Five we have the AFE that was discussed by Mr. Bent?

A Yes, sir.

Q And did you cause that AFE to be circulated to all the working interest owners?

A Yes, sir, I did.

Q Have you received any objection from any working interest owners for the AFE?

A No, sir, not at all.

Q And finally, when we turn to Exhibit Six, what are we looking at in the exhibit book?

A This is a copy of the operating agreement, proposed operating agreement, sent to all the parties in the well.

Q And when we turn to the COPAS attachments to the operating agreement and look under the overhead fixed rates, what do you recommend for this well?

A For this well it's $3500 drilling rate; $350 dollars producing rate.

Q And that is a rate that except for Tenneco's interest has been agreed to by others, other than Meridian?

A Yes, sir, it has.

Q And have you gone through a similar exercise with each of the other compulsory pooling cases before the Examiner today?

A Yes, sir, I have.

Q Let's go through and summarize, then, as of this point, today's hearing, Mr. Myrick, for Case 9593 what interest is outstanding and in what percentage?

A The Tenneco interest is still outstanding in the amount of 12.321712 percent.

Q And when we go to Case 9594, that's the Florence 260 Well, what party and what percentage interest is still outstanding?

A Again the Tenneco interest is 12.5 percent.

Q Case 9595, what parties are outstanding and in what percentages?

A Again the Tenneco interest, 6.25 percent; Texaco interest in the amount of 25 percent; and Don Turrieta interest, 12.5 percent.

Q In case 9596, what interest is outstanding and in what percent?

A Again the Tenneco interest, 12.5 percent.

Q Turning to Case 9598, what party and what percentage is outstanding?

A Tenneco, 25 percent.

Q And in Case 9599, what parties and what percentage are still outstanding?

A BHP Petroleum, 37.5 percent.

Q Other than Amoco's expressed objection to the risk factor penalty in the pooling cases, Mr. Myrick, are you aware of any other party having any other type of objection --

A No, sir.

Q -- to the forced pooling?

A No, sir, not at this point, no, sir.

MR. KELLAHIN: That concludes my examination of Mr. Myrick.

We'd move the introduction of his Exhibits One through Six in each of the pooling cases.

MR. CATANACH: Exhibits One through Six in each of the pooling cases will be admitted into evidence.

Mr. Carr?

CROSS EXAMINATION

BY MR. CARR:

Q Mr. Myrick, since Amoco acquired the Tenneco properties have you had any personal association with Amoco?

A We've -- yes, sir, we have. We've talked over the phone on several occasions.

Q And when you approach a company like Amoco to seek to obtain voluntary joinder in a prospect, is

the risk penalty a matter which is open for negotiation or is that something that is predetermined?

A I don't follow your question, I'm sorry.

Q I mean when you ask someone to, say, sign an operating agreement or join with you in development of a property that you operate, are you an individual who would have authority to, say, negotiate whether the penalty is 250 or 100 or --

A No, sir, I'm not.

MR. CARR: That's all I have.

MR. KELLAHIN: No further questions. That concludes -- Mr. Examiner, I have not marked these with an exhibit number but they represent certificates of mailing and copies of return receipts that I have had sent to parties in each of the pooling cases. I marked these at this time as Exhibit Number Nine in the first case, which is 9593, but they do apply to each of the cases as shown in the certificate.

MR. CATANACH: Okay. Exhibit Number Nine will be admitted as evidence.

MR. KELLAHIN: And that concludes our direct presentation, Mr. Examiner.

MR. CARR: Mr, Examiner, I apologize for doing this to you but I've decided not to call a witness.

MR. CATANACH: Oh.

MR. CARR: I do have a brief closing statement whenever that is appropriate.

MR. CATANACH: Mr. Kellahin, we're not quite finished with some of these cases. How do you want to proceed with that?

MR. KELLAHIN: May we go off the record for a moment?

(There followed a discussion off the record.)

MR. CATANACH: Okay, at this time we'll let Mr. Carr make his closing statement.

MR. CARR: May it please the Examiner, Amoco is before you today not opposing the entry of compulsory pooling orders but requesting that a risk penalty of less than 200 percent be imposed by the Division.

We would call your attention to prior compulsory pooling orders in this pool entered on applications filed on behalf of Meridian where the penalty was 156 percent. We believe that some thing between 100 and 150 percent would be appropriate.

Meridian wants to pool and they're asking for the 200 percent penalty but it seems to

us something doesn't add up. They come before you and they scream that everything out here is just like a wildcat but they can't point to any true dry holes. They can't tell you how many geologic failures they have; and we submit to you that this mad drilling campaign that's going on out there to drill up the acreage, that if any of those factors were present you would know about it and we would know about it.

But Mr. Meibos will sit here before you and tell you we're just drilling in these areas because that's where our acreage is. We submit to you that a company that is out there going to drill more than 100 but less than 1000 wells, when they've only got 44 of their 210 wells currently connected, they can't give you an awful lot of information, are either going forward with surprisingly little information or they actually have more information than they're leading the rest of us to believe.

Mr. Bent takes the stand and Mr. Bent talks to you about the fact that there are higher risks on -- his factors are higher for some wells because there are higher risks associated with some of the completion techniques that are employed by Meridian. I submit to you that it isn't appropriate to impose the full penalty on us because they have elected to use some riskier completion techniques.

Mr. Caldwell comes before you. Mr. Caldwell talks about including in the risk penalty calculations that he makes CO_2 lines, salt water disposal well, and a treating plant. The statute that governs the imposition of a risk penalty let's you impose a penalty to include a charge for the risk involved in drilling of such well. I submit to you that the CO_2 line and treating plant and salt water disposal well isn't a cost properly includable within a charge to be assessed for the drilling of the particular well.

What we simply have here is a situation where somebody has a very active drilling program, and there's nothing wrong with that, where they're having to come in and pool the acreage, and there's nothing wrong with that, but we say to you we believe they're asking based on these wells for more of a penalty than is warranted and I think the most telling thing in the testimony today was when Mr. Meibos stated that when they met as a group to determine what they were going to recommend to you as a penalty, they worked backwards from the 200 percent.

I submit to you they were letting their desired result dictate the testimony and the evidence they presented; that the application should be granted but that a risk penalty should be assessed in the

range of 100 to 150 percent.

MR. CATANACH: Thank you, Mr. Carr.

Mr. Kellahin?

MR. KELLAHIN: Thank you, Mr. Examiner.

Let me explain to you why Mr. Carr's analysis of the economic risk portion of the penalty is not an accurate summation of what is intended by that portion of the exhibit.

Very simply, if you were dealing in a sandstone gas reservoir with gas production and you had a water problem that you needed to dispose of water, the cost of disposal of that water and producing that water has got to be integrated into the cost of drilling, completing, and producing that well at that location. You may determine that you do not have a well of sufficient economic viability, sufficient reserves, that you can project for that well to support the structure that's necessary in order to produce that well.

We are by no means saying that the economic risk is for anything other than a portion of the risk assigned the drilling and completing of the well.

That was Mr. Caldwell's testimony. I specifically asked him about that testimony, and

if Mr. Carr wants to put a different slant on that testimony, I think it's the wrong slant.

The only credible testimony under oath was Mr. Caldwell's and his testimony was that he in preparing the economic risk understood and meant this analysis to be part of the general reservoir risk involved in the drilling and the completion of the wells. I specifically read in that portion of the pooling statute. I think there's no question that that 20 percent he's assigned in the Atlantic B Com 220 Well is an appropriate part of the risk. We have always utilized in analyzing the risk the question of whether or not you obtain production, whether that production was going to be commercial production for the life of the well. We continually present to you cases where we show you that you can encounter the reservoir and are expected to produce some hydrocarbons but historically the Commission has, rightfully so, granted as an element of that risk whether or not that well is ultimately going to be economic, and part of his economic analysis includes the necessary facilities to treat, dispose of, and handle produced water.

Mr. Caldwell told you that they certainly did not intend to, nor did they have any preconceived design on backing into or justifying the maximum penalty. His testimony, while he stood before you

on the Exhibit Seven-E showed you that in many specific instances for these six wells they collectively reached a risk factor penalty in excess of the statutory maximum and they utilized that.

With regards to the prior pooling orders, Mr. Meibos explained to you that the presence of coal should diminish the risk. Mr. Meibos has addressed that in half a dozen different ways with all his displays and he has shown you and has repeatedly answered the question that the presence of coal is not the question. He had mapped that coal seam and he has shown you from comparing well to well how erratic and unpredictable that risk can be.

We think we are entitled to a 200 percent risk factor in an unconventional reservoir where that risk, despite the experience of Meridian Oil Company and its experts is still significant.

To try to put this in some perspective for you, let's look at the Amoco interest in case 9593. That's the Atlantic B Com 220 Well.

Total well cost is slightly over $419,000. We are asking Amoco, based upon their expertise in this area, to participate with us. They've got coal gas production in this area. They developed the Cedar Hills Pool. We're not asking them to pay us a great deal

of money to help us share that risk. Simply 12.32 percent of $419,000. All we want Amoco to do is to pay its share of $51,000.

That's all we want. We want them to participate and if they choose not to, then let them recoup to us out of their share of production the inherent risks that are involved for us carrying their share. But if $51,000 is too much for them to pay, then we think a 200 percent penalty is only appropriate.

Thank you.

MR. CATANACH: Is there anything further in Case 9593?

9594 will be readvertised for February 15th, I understand?

MR. KELLAHIN: Yes, sir.

MR. CATANACH: And we'll leave the record in that case until then.

We'll at this time take Case 9593, 9595, 9596, 9598 and 9599 under advisement.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C. S. R. DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9593 94 95 96 98 99 heard by me on February 1 19 89.

David R. Catanach, Examiner
Oil Conservation Division