STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO

14 May 1986

EXAMINER HEARING

IN THE MATTER OF:

Case 8030 being reopened pursuant to the provisions of Order No. R-7471, Sandoval County, New Mexico. CASE 8030

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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I N D E X

E X H I B I T S

MR. CATANACH: Call next Case 8030.

MR. TAYLOR: In the matter of Case 8030 being reopened pursuant to the provisions of Order No. R-7471, Sandoval County, New Mexico.

MR. CATANACH: Are there appearances in this case?

MR. KELLAHIN: If the Examiner please, I'm Tom Kellahin of Santa Fe, New Mexico, appearing on behalf of Gary Williams, Oil Producer, and I have two witnesses to be sworn.

(Witnesses sworn.)

MR. KELLAHIN: Mr. Examiner, we are back before you to make permanent the special pool rules for the Rio Puerco-Mancos Oil Pool in Sandoval County, New Mexico.

This is a fractured Mancos section. It's the Niobrara interval that's similar to the one that Mr. Greer operates in the Puerto Chiquito. There are temporary rules on 320-acre spacing. The two witnesses we have today are the same two witnesses that appeared at a hearing before this Division back on January 30th, '85, in

which this pool was discussed.

For your reference, the original case was 8030. The order is R-7471, entered effective March 7th of '84.

Subsequently there was an amendment to that order and that hearing is in Case 8448, heard on January 30th, 1985. The geologist and engineer from that last hearing are the two witnesses today.

DAVID DLOUHY,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q All right, sir, for the record would you please state your name and occupation?

A My name is David L. Dlouhy. I'm a staff geologist with Gary Williams, Oil Producer, in Denver.

Q Mr. Dlouhy, did you testify before the Division on January 30th, 1985, concerning the special pool rules as one of the subject matters of that hearing for the Rio Puerco-Mancos Oil Pool in Sandoval County.

A Yes, I did.

Q Pursuant to that testimony and your em-

ployment, had you studies the geology of that specific area for this Niobrara interval in the Mancos?

A Yes. I've studies it thoroughly and I've been involved in the project since my start with Garyl Williams on the order of three years ago.

Q Let me refresh the examiner's recollection of what the situation was with the pool back on January of '85 very briefly.

I have taken out of the case file, 8448, a copy of Exhibit B as well as a copy of Exhibit C. I'm going to lay these out on the table, sir, and if you'll come around, I want to ask you some questions about them.

Mr. Dlouhy, with regards to Exhibit Number B from Case 8448, does that represent your work product or a work product that you have reviewed and concurred with at that time?

A This represents a combined effort with respect to a work product. It's a seismic structure map that integrates seismic data along with geologic data. So input into this map involves my input as well as a geophysicist's input.

I'm thoroughly familiar with everything that's gone into it and again I've reviewed that data.

MR. KELLAHIN: At this time we'll tender Mr Dlouhy as an expert petroleum geologist.

MR. CATANACH: Mr. Dlouhy is considered qualified.

Q Let me have you take a few minutes and explain to the examiner generally the type of geologic features and characteristics that you have determined existed back in January of '85 with regards to this pool, using first of all Exhibit Number B as an example of what you want to explain.

A Okay. Basically, the Rio Puerco Field is a fractured Mancos producing pool. It's very similar to the fracture fields elsewhere in the San Juan Basin, the Puerto Chiquito Field probably being the closest, the Boulder Field and the (not clearly understood) Field also being very analagous.

What you see on Exhibit B is our detailed structure map of the Rio Puerco Field, again expressing the structural variations in the Mancos, and we believe that the structural variations are related to fracturing.

The production is very specifically related to fractures and fracture trends and very limited dependence on lithology.

Exhibit B again shows our structural interpretation and it's one mechanism that we use to try to propose the fracture trend and the extent of the fracture systems in the Rio Puerco area.

On the map you also see two cross section lines, which is Exhibit C and the intent there is to show, really, the lithologic variations are very minor throughout the field, the lithology being a very minor factor with respect to production, oil and gas production, in the Rio Puerco Field.

Q Let's go to Cross Section C from the hearing back in January, 1985. Perhaps you might want to speak from the wall. Let's hang this one up there.

A Oil production from the Rio Puerco Field comes from a portion of the Mancos that is commonly referred to as the Gallup or Niobrara. It's roughly in the center of the Mancos section, roughly about 800 feet from the Point Lookout and again about 800 feet above the Greenhorn limestone.

This is a cross section of the portion of the Mancos that's particularly prone to fracturing and is essentially the portion of the Mancos that we're producing oil and gas from in the Rio Puerco Field.

What I wanted to illustrate here by two cross sections that generally criss-cross the entire pooled area, as proposed in January, is a very consistent lithology throughout the Rio Puerco Field, consisting of a very finely -- about a 400-foot section of very finely interbedded, very fine grained sand, silt, and shale, again very consistent

throughout the field, very easily correlated. We've arbitrarily identified a zone in this portion of the Mancos and have labeled them A, B, C, and D.

The lithology shown here represents a very low porosity, permeability matrix, and the key to the play and the production is the fracture system, and basically what I'm trying to illustrate is the consistency of the lithology and, really, the fracture systems are what dictates the play in general.

Q Let me direct your attention now to what we have marked as Exhibit Number One for today's hearing. We have a larger copy of that one on the wall, and then I hand the examiner reduced copies of the same exhibit.

First of all, sir, would you simply identify the exhibit and explain who prepared it and how it was prepared?

A Okay. The exhibit shows the Rio Puerco Field. The wells are identified by the dots, obviously.

What's shown with the boundaries are three things: First, the original spaced area that was temporarily spaced in 1984 and consists of fifteen sections in the central portion of the Rio Puerco area.

In addition to that, in the yellow spaced area, the expanded area that we requested in January, 1985, and then the resultant spaced, temporarily spaced area that

was due to the request, as well as the voluntary state rules expanding the area into the purple.

Q Let me clarify at this point a drafting error on the exhibit and have you indicate for us what is intended by the red X-marked areas.

A Due to a drafting error, and we certainly apologize for this, the boundaries, the eastern boundaries were -- were inappropriate. The X's cross out the area that we're requesting to be part of the spaced area and, again, the pencilled in, or penned in boundaries are what we're indicating to be the boundaries of the spacing.

Q Who prepared this exhibit?

A A combination of personnel at Gary Williams, including myself and John Nikonchik, as well as our drafting (not clearly understood.)

Q Other than the inaccurate boundary of the eastern boundary of the pool, which you've corrected, to the best of your knowledge is the rest of the information accurate?

A Yes, it is.

Q Orient the examiner, would you, please, sir, to where the pool, this subject pool, lies in relation to other Mancos pools in the area, particularly West Puerto Chiquito?

A Okay. The Rio Puerco area is located in

the southeast edge of the San Juan Basin. Just to the north of us about fifteen or twenty miles is the Puerto Chiquito Field, the Puerto Chiquito East and the Puerto Chiquito West Field. Both are on the margins of the basin and this is really one of the mechanisms that cause fracturing, very similar in respect to the -- the fracturing concept, being on the edge of the basin and being in an area in the basin where you have structural deformation to give you fracture systems.

The Boulder Field is again located maybe twenty-five miles north of our area, again on the margins of the basin, again an area that's been structurally deformed and giving or resulting in fracture systems.

Other fracture production in the basin, there is the Dougherty Field (sic), which is on the other end of the basin, on the northwest portions of the basin, but again very similar in mechanism, fracturing being a very important concept rather than the lithologic factors.

Q Identify for the examiner what additional wells have been drilled since the January, 1985, hearing in this pool.

A Okay. The large dots are additional wells that have been drilled since the January, 1985, hearing. The green wells are wells that were drilled and operated by Gary Williams. The orange wells are wells that are

operated by other companies.

Q With the additional information geologically that's been derived from these wells, do you still have the same opinion or do you have a different opinion about the geology of the formation that's being produced?

A The additional data that we've gotten by drilling these wells really changes our interpretation not at all. It, in fact, confirms our interpretation without a doubt about the lithology. It helps us better define the fracture systems but obviously we're still pursuing that and possibly the only change really is that there is an implication that maybe the fracture systems are even more regional than we originally thought in our original proposal.

Q If temporary rules that the operators in this pool have been working under include 320-acre spacing, do you see any geologic reason that would cause you to recommend that the spacing be other or less than 320 acres per well at this time?

A I don't see any reason to change the 320 from a geologic standpoint for the following reasons:

Geologically the mechanisms, again, that are important here are the fracture systems that are draining a very tight matrix. The very tight matrix in itself really dictates that spacing on the order of 320 is very appropriate. In fact the optimum spacing hasn't been deter-

mined yet but 320 is the best we feel as a compromise at this point.

Q In determining whether or not the present outer boundary of the pool, as depicted on Exhibit Number One, is one that is reasonably oriented to the reservoir being produced, can you express an opinion?

A For the data that we have to date, it certainly covers the fracture trends the way we see them at this point and most of this data is based on the well data from the wells in this area.

The boundary does include all fo the wells that we feel are in a fractured reservoirs and a similar producing zone in the Mancos throughout the area. The fracture trends may extend beyond this. We don't have the data really to say that one way or another, and again ths is defining the best we can at this point the regional extent of the fractures.

Q Based upon your study of the geology, do you have an opinion as to whether the wells that are currently subject to the pool rules are in the same common source of supply as one reservoir?

A I think the data, particularly from a geologic standpoint, indicate that there is no doubt that it is a common pool.

The concepts involved here that I believe

to be correct, include an oil-charged Mancos section and throughout the interval that we're producing, and that the fracture systems are draining this oil-charged portion, and the fracture systems seem to be oriented particularly to a number of zones within the Mancos and all of these zones are really what we've addressed throughout the pooled area.

Q Based upon the study of the geology do you have an opinion and recommendation to the Examiner as to whether or not the temporary special rules ought to be made permanent at this time?

A I recommend without a doubt that the temporary rules need to be permanent, primarily for the reason that I think we'll present information that will show that anything less is inappropriate and again the 320 give us the best compromise in respect to determining the absolute correct spacing and whether it should be larger or (not clearly understood.)

MR. KELLAHIN: That concludes my examination of this witness.

We'd move the introduction of Exhibit Number One.

My second witness is an engineering witness that has further information.

MR. CATANACH: Exhibit Number One will be admitted into evidence.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Dlouhy, what was the purpose of Case 8448?

A I believe that case was our hearing in January, 1985, and basically that was a request to expand the spacing rules and the pool rules to include a larger area other than the 15-section pooled area shown in white, and the reason for this is at that time we had been -- we were drililng wells outside that original 15-section spaced area and we really needed those pool rules and regulations to apply to these wells.

At that time we -- we made the attempt based on our best information, the regional extent of the fracture and the common pool.

Q Has an order been entered by the Division on that case?

MR. KELLAHIN: Yes, sir. It's Order 7471-A. I have the Division's case file from that case here and this is the order that was entered.

Q In the expanded area there are currently -- there have been two wells drilled in that expanded area.

A Correct. One by Gary Williams. Actually, three wells in the expanded yellow portion, two by Gary

Williams and one by Hixon (sic) Oil.

Q Do you feel that you have enough information to make a conclusion that 320-acre spacing should be instituted in the expanded area as well as the original area?

A I think that the engineering data that will be presented will show you that the 320-acre spacing should be expanded to the entire pooled area.

MR. CATANACH: I have no further questions of this witness.

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q Do you see any geologic reason to treat the expanded area differently than the original spaced area?

A No, there's no geologic reason; the reason to expect anything different throughout that entire spaced area, or proposed spaced area.

JOHN NIKONCHIK,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q All right, sir, would you please state your name and occupation?

A My name is John Nikonchik. That's N-I-K-O-N-C-H-I-K, and I am employed as a petroleum engineer with Gary William, Oil Producer in Denver.

Q Mr. Nikonchik, did you testify before the Division as a petroleum engineer back on January 30th, 1985, in the case that was presented by Gary Williams on that date?

A I did.

Q Pursuant to your employment as an engineer, have you conducted studies and drawn additioal opinions with regards to the application that is pending today to make the Rio Puerco Mancos pool rules permanent?

A Yes, I have looked at that.

MR. KELLAHIN: We tender Mr. Nikonchik as an expert petroleum engineer.

MR. CATANACH: The witness is considered qualified.

Q Let me have you summarize for us, Mr. Nikonchik, what the status was of the general engineering opinions and conclusions that you had in January of '85 and

then have you describe for us what additional studies have been conducted by your company and others participating with your company.

A Okay. In January of '85 when we were here petitioning for the extension of the pool we had quite a lot of well data that indicated that certain wells, when they encountered a high capacity fracture system were going to make significant quantities of oil and drain fairly wide areas.

At the time we also suspected that there was interference among wells at the density that we've got it right now and, in fact, some of the evidence we presented last -- last year was that using a typical example of a well that encounters no fractures upon drilling and completion, that we could expect somewhere between 5 - 6,000 barrels of ultimate oil. Basically you're going to be losing $3-to-$400,000 on a venture like that.

On the other hand, if you can encounter a substantial fracture system with the drilling of a well, we had an example then, based on the best well in the field that we could produce up to 175,000 barrels per well for a $2.5-million profit, and based on some basin average recoveries of 5-700 barrels per acre, which Greer has testified to in his hearings, it's just kind of -- some of fractured Gallup plays just seem average in there, you're looking at a

drainage of 250 to 350 acres for a well that's capable of making that kind of oil.

Obviously, those are the wells we're looking for, the ones that are going to make us the most money.

At the same time we presented some interference data between the 11-16 Well and the 1-16 Well. As far as locating those in your -- actually, if you look at the Exhibit Two in the first part of the package here, it's probably easiest to see.

Within the dotted line area there is Section 1 there and then Section 11, as numbered.

The 11-16 well is in the southeast southeast of 11 and the 1-16 is in the southeast southeast of 1. Those wells are approximately 7500 feet apart.

Prior to the drilling of the wells between there, when these were practically the only two wells existing in the pool, an interference test was run whereby the 1-16 well had been shut in for a substantial period of time. The 11-16 was also shut in, brought on production at 500 barrels per day, and affected the pressure in the 1-16 to the point where it was declining at 2/3rds of a pound per day after 24 hours, and that decline continued fo the next five days.

That was part of the evidence as presen-

ted last year. This was on the same magnitude as the interference tests that Greer ran in 1965 in Puerto Chiquito, where he showed interference up to I believe 9000 feet in some instances. Therefore, you know, we're reaching a conclusion that our fracture system in this area is similar to the same fracturing that they have in Puerto Chiquito. And again, as David has testified, our lithology is the same; our depths are similar to Puerto Chiquito; porosity, matrix porosities are the same; our permeabilities of the matrix are the same; fluids are both almost identical 40-41 degree oil. The only real difference between Puerto Chiquito and ourselves is basically depth. They're probably 1000 feet average deeper than we are; little higher gas saturation in the oils initially.

Based on all that data we requested and it was subsequently approved to have that 320-acre temporary spacing expanded to the area, as requested, basically because the 320-acre spacing, if a well encounters the high capacity fracture system and you get an economic producer, it has the ability to produce up to that, if not more, on an acreage basis.

We also proposed 1800-foot minimum distance between wells, as to try to eliminate direct competitive offsets to the -- and the drilling of unnecessary wells, producing virtually from the same fracture system,

and we have subsequence evidence that would indicate that even at some of the distances we have, that this is happening.

With what has happened since that, over the last year, we have no reason to change our posture on the 320 spacing or the distance between wells. We feel that is a good, workable spacing to develop this field.

Also during the last year we convened a working interest owners committee and formed a technical subcommittee to study unitization of the area for potential gas injection and pressure maintenance. We started proceedings with the BLM as far as establishing boundaries for a Federal exploration unit and also the coincident secondary recovery unit with that establishment, and although the current oil economy slowed us down a little bit, we still intend to move forward with that later this year.

Q Mr. Nikonchik, do you have the support of the other operators in this pool for continuation of the 320-acre spacing per well and the minimum distance between wells, those requirements of the special rules?

A We have nothing in writing but during the Technical Committee meetings an interest represented there approximated some 80 to 90 percent of the ownership within this area for the most part.

Spacing and distances were discussed to

some degree and there was never any objection raised by anybody to the contrary. Everybody is comfortable with that development and thinks it is appropriate for the continued development of this field.

Q Based upon the subsequent information that you have studied and examined, do you still, as of today have the same opinions with regards to the wells pacing and minimum distance between wells?

A Yes, I do.

Q Let's turn to Exhibit Number Two then --

A Okay.

Q -- and have you bring the Examiner up to date as to what has occurred since the last hearing, what the situation is now, and starting with Exhibit Number Two show us what's occurred.

A Okay. Exhibit Two is an enlargement of the central area of the fracture trend. We would, I guess, want to identify this more, or consider it more the sweet spot. This is an area where we have been luckier and -- luckier, I guess, to encounter the high capacity fracture system more often.

The only well within this area, actually there was a couple of wells that -- there's three new wells that were drilled since the last hearing. There was two Champlin wells up to the north. I believe you'll see those

on your Exhibit One. They are circled in red.

And then down in Section 13 we drilled our 13-11 Well in the middle of last summer. And to back up and establish a point, when the field was first discovered, or actually the first -- when the 11-16 Well was drilled, we took some bottom hole samples. Now this was at a point in time when very little production had occurred from the field. A bottom hole sample PBT analysis indicated a bubble point or a solution gas/oil ratio of 340. We had under-saturated oil bubble point being about 1037 pounds. The pressure at that time was 1000 or 1265 pounds.

With subsequent production from the fracture trend one would expect the pressures to decline. If the pressures were lowered below bubble point, you would expect free gas breakout and subsequently higher gas/oil ratios on a producing well.

When the 13-11 was completed last year, its shut-in bottom hole pressures were 820 pounds. Its producing gas/oil ratio was about 3000-to-1.

From this, and yet it was still -- I guess we IP'ed that for 20 barrels a day flowing. From this we concluded that that particular location had been affected by down dip production in the way of lowering reservoir pressure to the point where it very rapidly went below bubble point and started producing higher amounts of gas. We

take this as one significant point of communication over a fairly large distance. In fact, from the 11-16 well we're almost -- almost a mile away from that point there, which is the nearest production point.

As you've noticed, I have circled this area and have considered this a 17-well, typical area here, for development. Anyway, I've run some subsequent economics in there which we'll get to at the last exhibit.

Also, as a result of some of the work we did in the Technical Committee, it was obviousl to everybody that if we're going to work towards installing a presure maintenance program, that conservation of reservoir energy may be important and to get a better handle on that, I guess in late November of '85 Gary Williams shut in all of its producing wells in this area in an attempt to start that proceeding.

As it stands now, we only have ten of our wells that are now producing. The rest are shut in. Of course, a lot of that is due to the current economy, too, but -- but during that time we took the opportunity to run some interference test-type with production rates.

Champlin Petrolewm kept most of its wells producing during that time. In particular I'd like to point out the 44-2 Well, which you'll see in Section 2, being the southeast southeast on your map.

Other wells, key wells that we're going to get to are the two Section 12 wells being the 12-2 and the 12-4, the 12-4 being a direct diagonal 40-acre offset or a normal 80-acre offset and if you would, you could turn to Exhibit Three, I'd like to explain what we have going on there.

The lowest curve here at the bottom is the daily production rates on the Champlin Federal 44-2. During the months of October and November the dashed line indicates the average daily production for that well and I've drawn a decline through that to kind of give you the idea of what the trend was at that time.

Prior to the end of November the well was producing in the 15-to-20 barrel a day range.

On November 28th is when Gary Williams shut in all of its producing wells. The second -- the middle curves are the combined 12-2 and 12-4 Wells, that run to a common battery, and the upper curve is the 11-16 Well, which is again our best well in the field.

The, like I say, all wells were shut-in.

Approximately seven days after that the 44-2 Well built from a rate of, say, 15 to 20 barrels a day, up to approximately 35 barrels per day, which was an increase of some 15 to 20 barrels or production as a result of shutting in our wells.

Approximately two weeks after the shut-in period the -- one well was brought in -- brought on production in that area of ours, being the 12-4, which is the direct 80-acre offset.

Seven days later the production in the Champlin well dropped back to the 20-barrel a day range.

Coincidentally, the 12-2 was brought on production at the same time. I don't believe that that was a direct, immediate affect of that well. I believe it's the 7-day lag time, as you saw, when we shut the wells in.

Again, right around the 25th of December, all wells were shut in again and although we've got some pulse type effects in the reservoir now, the Champlin well again started building production rates and it got as high as 54 barrels per day there in early January while we were still shut in. In a general sense it was trying to maintain that 35-barrel a day rate again.

Come around the first or second week of January, both Section 12 wells were started together. As you can see, they produced 150 barrels a day the first day between them, and again approximately 7 to 8 days later the Champlin well again started losing production to the 20-barrel a day range.

A couple of more points: The 11-16 was shut in during this entire time. At approximately January

16th the 11-16 was brought back on production at about 80-to-90 barrels per day.

The, a note I'd like to make is that as the 11-16 was continued to be shut-in, the combined production between the 12-2 and 12-4 got constantly higher. The stabilized rate prior to shut-in was about 70 to 80 barrel a day. It was 80 to 90 during the first production period, and then when they were brought on in early January, they peaked at 150.

When the 11-16 was brought back on, both combined production from the 12 wells went back to the 40 or 50 barrels a day range. I take that again as a production interference.

I believe that further the 11-16 Well may have been responsible for affecting production in the Champlin well even further, as at approximately the end of January the Champlin well dropped below 20 barrels a day, started making significant amounts of water along with its production has been erratic ever since most of our wells have been back on.

From this I can conclude that with the density that we've got right now, we are affecting -- we can affect production from well to well in that we're not losing any oil production but it's just -- it may be produced through wells that may or may not be unnecessary in part or

in whole.

We've got some further examples, Exhibits --

Let me ask you one question about --

A Okay.

Q -- about Exhibit Number Three. Can you conclude or reach the opinion based upon the production interference effects that you see the effects between or among wells that are at least 320 acres apart?

A Yes, that's very true, and in fact if the -- I guess the 44-2 and the 11-16 are exactly a mile apart, and they are on, you know, 320-acre plots, and also the 12-4 is, you know, the next adjacent 320-acre plot.

Q You can conclude, then, from examination of the interference effects, not only do we see effects between wells that are 40 and 80 acres apart but we also see effects between wells 160 and 320-acre spacing apart.

A That's correct.

Q All right, let's turn to Exhibit Number Four and have you identify that exhibit for us.

A Exhibit Four is a well decline curve on the Johnson 6-16 Well that we operate. That well is located in the dotted 17-well area as the easternmost well over in Township 20 North, 2 West. It's the southeast southeast of Section 6.

This well was completed in late 1984 and brought on production in January, 1985.

In preparing these exhibits I made an assumption that a high capacity well that was significantly far enough away from the other production, would probably produce with a somewhat predictable decline, figuring that it could not be affected by production from another source.

And in this case when we took a look at the decline on the 6-16 Well, that was very much the case. The decline has been very predictable over the first 11 to 12 months and except for the shut-in period in January -- December, '85, and January of '86, it's been almost -- well, it's been very predictable and it's basically recovered some of the production that it lost during the shut-in period, and we feel that this extrapolation might be considered as a type curve for a fractured reservoir that's unaffected by other producing wells.

Well, to verify that, I wanted to overlay this curve on some other decline curves and the next two exhibits -- the next Exhibit Five will show you this same, exact decline curve, the same decline parameters, initial decline rate, hyperbolic rate, or shape factor, and -- and the whole thing.

The top well is hte 11-16 Well, which again is, like I say, our best well, laid on from the point

where it was allowed to reach a maximum production of 320 barrels per day, which was a controlled allowable in September of '84. The decline has pretty much followed that same trend.

Again, the 11-16 Well is in the middle of this trend. It is the highest capacity well we have in the field, and I believe this from the standpoint that since it is the highest capacity well, other wells will have a hard time affecting its decline.

On the other hand, the lower well is the 6-16 -- or 16-10 Well, which is the extreme westernmost well in this dashed area. Again it is a high capacity well. It is far enough away, it's actually over -- almost two miles away from the 11-16 Well. It's decline should be relatively unaffected by other production, and such is the case. As you can see, this decline also is very predictable and again I'd like to emphasize, this is the same, exact decline.

The next Exhibit Six indicates two of the many wells that have been affected by production from other wells, I believe.

The top well is the San Isidro 1-16. This is again the same 1-16 as referred to earlier in the southeast southeast of Section 1.

Initially, in 1984, when the well was brought on production, it exhibited again for approximately

six to eight months the same exact decline rate.

About 1985, beginning in '85 is when the 11-16 had been producing a high rate and the 6-16 came on, it's when a lot of production hit -- came on line right in the early 1985; the Champlin 44-2 Well, also.

At that time production from the 1-16 dropped significantly, as you can see, and started to basically reach an economic limit. In December of '85 the well was shut in for a period of time. It has since recovered some of that production rate. I attribute that to the shut-in period. As of yet it has not tended to decline again from that approximately 9-to-10 barrel day rate.

Q Let me look at the San Isidro Well, that production rate, compared to what well did you say you thought had an impact upon that well's production in late '85?

A It could have been -- specifically, it's hard to say exactly which one may have done that. Obviously, from the early interference test data with the pressure gauge in the hole the 11-16 was able, we suspect, to affect pressure in the 1-16. I would therefore assume that the 1-16 has been affected in some degree by the 11-16.

Maybe --

Q And those are wells that are a mile apart aren't --

A Those are wells that are a mile apart, but maybe more importantly, the Section 2 -- 2 wells also came on production in late '84 or early '85, and may have actually, because they're closer, been more responsible for affecting the decline on the 1-16, and again, at the same time, the 6-16 Well came on, the one that's a mile to the east came on, also.

It could be one or all in combination that is affected. That's very hard to identify specifically which wells are affecting each other, other than the fact that we have established the communication directly between the 44-2 Well and the Section 2 wells.

Q We often --

A The Section 12 wells.

Q We often see reservoir engineers come in to prove up spacing by taking volumetric calculations, decline curves, some pressure information, and concluding that wells ought to be spaced on a given pattern.

Within that kind of process, how would you equate the process that your company went through in determining production interference effects between wells?

A As far as assessing the volumetric aspects, I really seriously doubt whether there is any way to calculate volumetrically how much oil is in place in a fractured reservoir. You just don't know where it goes, how

high it is, how wide it is. What we do know is that when a well encounters a significant fracture system, it's able to make a significant quantity of oil; i.e. probably 100 barrels a day or more. When it does not, usually the wells IP for much less than 50 and decline very, very rapidly.

Q Are you satisfied as an engineer that the utilization of the interference effects of production among wells is a reliable method in which you are confident that we can then space those wells?

A I think in combination with some economics that we'll present, I think, yes, very definitely.

Q Let's turn then to the economics if you're ready to do that, and look at Exhibit Seven. Is this also an exhibit that you've prepared?

A Yes, it is.

Q Would you describe for us what the economic study that you have done concludes for you in terms of well spacing? What's your ultimate conclusion about the economic effects of well spacing for this pool?

A Sure. I've got two points in time that I've tried to evaluate some economics here. Again I'm referring back to the 17-well area as an example, and it actually is a more optimistic example.

Through the end of 1985 these wells have cumed approximately 336,000 barrels of oil in combination.

After taking into account the average net royalty interest and giving it $25.00 per barrel of oil as a sales price during that period of timed, extracting production taxes, lease operating expenses, you end up with an operating income of some $6-million. Well, those 17 wells at an average of $450,000 apiece have cost us $7.6-million. We're still a million and half dollars in the hole on these wells.

Now, granted we did not drill them all as Gary Williams. There are five wells in there drilled by Champlin Petroleum, but on an average as the operators, this is what we've seen.

Ultimately we expect these wells to cum approximately 520,000 barrels. Now some of the wells are shut in and probably will not be reactivated, so this is from a lesser number of wells that are going to make this last bit of oil, but again adjusting for the average net revenue interest, and again assuming a $25.00 a barrel oil price to be consistent in the evaluation, although we're only getting $11.50 at the wellhead right now, we would end up with a $10-1/2 million sales revenues. Backing out expenses and operating and taxes leaves us with $8.2 million income. Removing our $7.6 million investment leaves us with a half a million dollar profit at probably something less than a 10 percent rate of return. This is marginally economic at this point.

Drilling wells on closer spacing than we have, we've already seen that we can effect production on the spacing that we're at. Drilling it any closer would only enhance that to the point where we will be drilling unnecessary wells and we believe, though, that each well we drill from here on teaches us more about the reservoir and we're hoping that our statistics will improve in finding the main fracture system with fewer wells. Right now our success rate is about 6 out of 17. If we can make that 1 out of 2, we think we can improve these economics.

We like to think that 320's give us enough latitude to explore for that yet at the same time minimize the drilling of unnecessary wells.

Q Were Exhibits Two through Seven prepared or compiled under your direction and supervision?

A They were prepared by me.

MR. KELLAHIN: We move the introduction of Exhibits Two through Seven.

MR. CATANACH: Exhibits Two through Seven will be admitted into evidence.

MR KELLAHIN: That concludes our direct presentation, Mr. Examiner.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Nikonchik, who besides Gary Williams is an operator in this pool?

A Champlin Petroleum.

Q Is that the only other operator?

A Of any consequence. I believe the others -- Dave, there's nobody else producing, is there?

I think the other wells -- wells drilled by other operators, none of them are actually actively producing. I think they've been temporarily abandoned or abandoned.

Is that right?

MR. DLOUHY: Yes.

A And Champlin operates five wells. And I believe at least one of those is shut in, if not two.

Q And to your knowledge Champlin Petroleum doesn't have any objectin to making these rules permanent?

A Not at all.

Q Have you by any chance talked to our District people up in Aztec about this proposal?

A What -- as far as -- I'm sorry, which proposal?

Q The proposal to make the rules permanent.

A I have not and I don't know that anybody

else has.

Q You're saying at the current rate of success of these wells that it's uneconomical to have anything less than 320-acre spacing, is that correct?

A Yeah, that's right.

MR. CATANACH: I have no further questions of the witness.

Are there any other questions of this witness?

If not, he may be excused.

Is there anything further in Case 8030?

If not, it will be taken 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. 8030, heard by me on May 14 1986.

David R. Catanach, Examiner
Oil Conservation Division