STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF AMOCO PRODUCTION COMPANY FOR DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO

CASE NO. 11,645

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

November 7th, 1996

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday, November 7th, 1996, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

November 7th, 1996
Examiner Hearing
CASE NO. 11,645

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E X H I B I T

Applicant's	Identified	Admitted
Exhibit 1	6	14

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A P P E A R A N C E S

FOR THE DIVISION:

RAND L. CARROLL
Attorney at Law
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2040 South Pacheco
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FOR THE APPLICANT:

CAMPBELL, CARR, BERGE and SHERIDAN, P.A.
Suite 1 - 110 N. Guadalupe
P.O. Box 2208
Santa Fe, New Mexico 87504-2208
By: WILLIAM F. CARR

* * *

WHEREUPON, the following proceedings were had at 12:44 p.m.:

EXAMINER STOGNER: Hearing will come to order.

Call next case, 11,645.

MR. CARROLL: Application of Amoco Production Company for downhole commingling, San Juan County, New Mexico.

EXAMINER STOGNER: Call for appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr, Berge and Sheridan.

We represent Amoco Production Company in this matter, and I have one witness.

EXAMINER STOGNER: Is this witness Ms. Staley?

MR. CARR: Yes, sir, it is, and I would request that the record reflect that Ms. Staley remains under oath and that her qualifications have been accepted.

EXAMINER STOGNER: Let the record show that Ms. Pam Staley was previously sworn in Case Number 11,644. And I remind you you're still under oath.

Mr. Carr?

MR. CARR: Thank you, Mr. Stogner.

PAMELA W. STALEY,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. Ms. Staley, are you familiar with the Application filed in this case on behalf of Amoco Production Company?

A. Yes, I am.

Q. And are you familiar with the status of the lands in the subject area?

A. Yes, sir.

Q. Could you briefly summarize for the Examiner what it is that Amoco seeks in this case?

A. Yes, we seek approval to downhole commingle the Blanco-Mesaverde and Basin-Dakota Pools in the Stewart LS 6M well, located at 800 feet from the south line, 1165 feet from the east line of lot 16, Section 28, Township 30 North, Range 10 West in San Juan County, New Mexico.

Q. What is the current status of this well?

A. This is a newly drilled well. Basically, we have the Dakota formation shut in at this time, awaiting commingling approval, and the Mesaverde is producing.

Q. And why is Amoco here today seeking authority to downhole commingle production in this well?

A. We're seeking this because it basically (1) saves operating costs, (2) it will extend the life of the well, and we feel that the (3) commingling will assist us in lifting some of the fluids in this wellbore.

Q. Ms. Staley, why is this well coming on for hearing instead of being brought pursuant to Rule 303?

A. We're bringing it to hearing because it does not meet the current standards for administrative application under Rule 303. In effect, it does not meet the pressure requirements under this rule.

Why
Hearing

The idea in our 303 rule-making that we had last year was that we would not have one formation that would exceed the original reservoir pressure of the other formation. The reason for that was to try to not fracture the formation.

We're now asking you to take that rule that we created last year, and basically we're asking for an exception to step a little bit further and prove to you that we are not going to fracture that formation.

Q. If, in fact, this Application is granted and if the well is shut in, would there be crossflow between the Dakota and the Mesaverde formation?

A. Yes, sir, we believe with the current pressures that we have, that crossflow would occur. However, we believe that all the production would be recoverable.

Q. So even with the crossflow, you would not be looking at a loss of reserves?

A. That is correct.

Q. Are either of these formations what you would characterize as fluid-sensitive formations?

A. No, they are not. We've commingled these two reservoirs several times in this Basin and have seen no problems with compatibility.

Q. Have you prepared exhibits for presentation to Mr. Stogner?

A. Yes, I have.

Q. And they're set forth in Amoco's exhibit book?

A. Yes, sir.

Q. Would you refer to that exhibit book and identify the first document contained therein?

A. Yes, the first document is our Application on October 4th, asking for this to be set for hearing.

Q. In your opinion, are both of the formations anticipated to be marginal producing capabilities?

A. We set one as marginal. We basically needed both formations to drill this well, so one of the formations was marginal.

Q. Okay, let's go to the next document. Would you just identify that, please?

A. Yes, the next document required by the Rule is the C-102 for the Mesaverde formation.

Q. And that shows the survey location for the well in the Mesaverde?

A. Yes.

Q. And behind that you have the C-102 --

A. -- for the Basin-Dakota, which shows the same information and the location of the well.

Q. Okay, let's go to the next exhibit. What is this, this plat that's colored?

A. That plat relates to notice, and I've created a plat for both the Mesaverde Pool and then followed by one for the Dakota Pool.

The red sections on this are operated by Burlington Resources. The black section is the section -- or pardon me, the black spacing unit, excuse me, is the one that we are having the commingling done in. Yellow is the Amoco acreage, and blue is the Conoco acreage.

Q. And has this Application been provided along with notice of this hearing to both Amoco -- I'm sorry, to Conoco and Burlington?

A. Yes, on the page following exhibit four, the Dakota Pool, are the two green cards noticing both Conoco and Burlington in this action.

Q. All right, what is the document behind the copies of the return receipts?

A. Under the new commingling rule last year, we are required to fill out the Form C-107-A. As you'll note in the upper right-hand corner, we've marked this as a hearing for the approval process.

Q. This Application was prepared prior to the drilling of the well; is that right?

A. That is correct.

Q. And on this exhibit you have set forth the gravities for the oil; is that right?

A. I have not on this particular exhibit. I have in an exhibit further down. I can tell you what those gravities are.

Q. We've got the BTU content set forth on the exhibit?

A. That's correct, because it is predominantly a gas reservoir, we have provided the BTU content of the gas.

Q. And on this exhibit you've indicated that the Dakota, in fact, would be a marginal zone?

A. That is correct.

Q. Would you have been able to drill to this zone on a stand-alone basis?

A. That is correct, we would not have any -- And I suppose you could have used either one as marginal in this case. It required both to be. But together they're economic, but one of them required to be marginal.

Q. Let's go to the next document, which is a table on the Stewart LS 6M, and it is entitled a "Commingling Evaluation". What is this designed to show?

A. The exhibit in question is one that we provided prior to drilling the well, and I added it in here because we did provide with it the Application. It shows how we came to what we thought the current pressures would be in these wellbores.

And we did that -- If you'll look over, for each formation we used the shut-in pressure data, we averaged that for surrounding wells, and then we extrapolated that downhole to get the estimated pressure for each one of these formations, and those are the two numbers that are boxed. Those are the numbers that actually appear on our Application, on the C-107-A.

Q. Now, behind that you've got a diagrammatic sketch for the well?

A. Yes.

Q. This shows actual information, does it not?

A. Yes, it does. As I said, we were kind of caught in the period between filing for this Application and then also drilling the well during that period.

This particular exhibit documents the perforations that were made for both the Mesaverde and the Dakota, the type of frac that we were doing, and then the pressure post-frac that we got from each formation. And we're basically updating our Application at this time with those actual numbers from the well.

Q. Can you go now to the next page in the exhibit booklet and review for Mr. Stogner how it was you calculated the frac gradient?

A. Yes, in looking at the pressures here and in talking about whether or not we were going to exceed the original reservoir pressures, we used the frac gradient, which is a fairly standard evaluation done after a well is frac'd.

And using an initial shut-in pressure after that fracture stimulation, we would take that initial shut-in pressure where the well actually closes on the propped frac, plus the hydrostatic pressure of the frac fluid in the hole, and divide that by the mid-perf depth.

Being done in the Mesaverde, the hydrostatic pressure, we believe, is about .19 p.s.i. per foot. Our initial shut-in pressure was 1500 pounds. And using that to calculate a frac gradient, we come up with about .5 p.s.i. per foot. That would be the bottomhole treating pressure necessary to open a fracture in the Mesaverde. And that pressure would be 2436 pounds, calculated off the fracture stimulation.

I included this particular exhibit, coming from Halliburton, from their technical advisor, Randy Natvig, from the standpoint that his experience in this area indicates that we would see a frac gradient out here of about .43 to .5 p.s.i. per foot, and indeed that is what we saw in this particular well.

Q. Have you compared, now, the reservoir pressures between the formation?

A. Yes.

Q. And that's set forth on the next page?

A. Yes, sir.

Q. Would you review that, please?

A. Yes, as I indicated before, the bottomhole pressure under the rule of the highest pressure commingled zone cannot exceed the original reservoir pressure of any other commingled zone in the wellbore, adjusted to a common datum.

As you'll look down there, the Mesaverde original bottomhole pressure in this area taken from shut-in pressures was about 1293 p.s.i. The current bottomhole pressure measured in the treating of the well -- pardon me, in the initial shut-in pressures in this well, was 1836 pounds.

Q. And that's in the Dakota?

A. That is in the Dakota.

Q. Right.

A. So the problem that we have is that the Dakota pressure would exceed the original reservoir pressure, thereby making us not fit under the rule. The differential between that is 543 pounds.

Now, based on the frac gradient of about .5 p.s.i. per foot, it would take a pressure of about 2463 pounds that we've shown to actually initiate a fracture in the Mesaverde well, and this would be if the well was shut in, et cetera, and pressures were static.

That would be a differential about 1275 p.s.i. So you can see that we will be 730 pounds below the pressure that could cause the Dakota to fracture the Mesaverde.

And as we know, these pressures will also drop off out of these reservoirs somewhat quickly, but at the initial outlay we will have this problem.

Q. So it is your testimony that commingling will not result in fracturing of Mesaverde formation?

A. That's correct, we do not believe that it will damage the Mesaverde formation.

Q. Now, behind that we have a document entitled "Basis for Allocation". Would you explain this?

A. Yes, this particular rule provides for us to provide the allocation method to you. We did an analysis of several offset wells, and I've included behind this page that offset data which gives you the current production from each well.

We did averages of those and came up with the average production for each formation, that in the Mesaverde being 65 MCFD, and the average of Dakota production that we would anticipate would be about 70 MCFD.

The percentage of production thereby that we would allocate to the Mesaverde for gas would be about 48 percent of production, and the percentage that we would allocate to the Dakota, 52 percent.

We have had almost no liquids produced from the Mesaverde in this area, so we are allocating all of the production, the current oil production, to the Dakota in this particular wellbore. And in fact, when we got flowback on this well we saw no condensate.

Q. This allocation method is based on data from offsetting wells; is that correct?

A. Yes, it is.

Q. And then behind this document entitled "Basis for Allocation" are various plats and production plots from *Dwight's*; is that correct?

A. Yes. We're required to provide -- When we use an estimate for allocation, we're required to provide the backup information for that, which we have.

Q. And this is the backup information --

A. Yes.

Q. -- for the allocation?

Ms. Staley, if this Application is granted, in your opinion, would there be any potential risk of reservoir damage to the Mesaverde formation?

A. No.

Q. Will approval of this Application and the downhole commingling production in this well, in your opinion, be in the best interests of conservation, the prevention of waste and the protection of correlative rights?

A. Yes.

Q. Was Exhibit 1 prepared by you?

A. Yes, it was.

MR. CARR: Mr. Stogner, at this time we would move the admission into evidence of Amoco Exhibit Number 1.

EXAMINER STOGNER: Amoco Exhibit Number 1 will be admitted into evidence at this time.

MR. CARR: And that concludes my direct examination of Ms. Staley.

EXAMINATION

BY EXAMINER STOGNER:

Q. Ms. Staley, in your experience out in this area, how long would it take for these zones, for the higher pressure zone, to flow before the pressure was down where it met that gradient criteria?

A. In this particular area, the Dakota is fairly high-pressured, and I would anticipate before it got down to 1200 pounds it could be probably a couple of years.

That would depend, certainly, on how we were producing this well also. If it was -- If there were market conditions that caused us to shut the well in or something, that would be under full production.

Q. In the worst-case scenario, what could occur out there if the well tied in in this manner and then had to shut it in? Would there be a calculable flow between the intervals?

A. Yes, I think there would be crossflow occurring in this wellbore. But again, as we've looked at crossflow in this Basin, we do typically get the gas back from these reservoirs, so we don't see that as a problem.

We don't believe, again, that this is of a high enough pressure to cause any formation damage, which is the part of the rule that we are concerned with.

Q. Does your closed schematic of your diagrammed well, does that differ from the completions of the other two wells in this section?

A. Of the other two which wells?

Q. Existing wells, the Stewart LS Number 3 and LS Number 4.

A. Yes, we have larger casing in the other two wells.

Q. And why the larger casing in those wells?

A. We typically, during -- You know, we'll be using certain casing programs during certain times. We've found that as the pressures were higher in the Basin, we needed larger casing to accommodate larger frac strings and all.

In this case, the pressures were such that we were able to actually fracture-stimulate down the casing, so we have been able to basically reduce the size of the casing that we're using out here and be a little bit more efficient in how we equip our wellbore.

Q. Are either one of those wells in Section 28 downhole commingled similarly?

A. The Stewart LS 3 has been applied for, but we have not received it.

The other two I do not believe are downhole commingled. That would be the 6 on the Dakota. We have different well names on the -- from the Dakota to the -- if you're looking at those maps.

Q. Well, if they're not downhole commingled, how are they presently producing? In separate zones or as a dual?

A. As a dual completion.

Q. As a dual.

A. But as you probably know, we can come up with very different well names in the same wellbore, in the

State of New Mexico.

Q. All right. What -- Are they producing with the deeper string up the tubing and the other one up the tubing 4-1/2-inch casing annulus?

A. It's 5-1/2-inch casing in that well, and yes.

Q. And again, why can't this well be dually completed similarly to that with the -- up the annulus?

A. It could be. We don't see any reason for it to. And in fact, we think it will help actually lift some of the Dakota fluids, having the additional pressure of the -- and liftability of the Mesaverde gas.

Q. And, let's see, the fluids will be attributed to which interval?

A. To the Dakota side.

Q. To the Dakota. And what's your anticipated fluid load out of the Dakota?

A. About a half a barrel a day. Is that what you're asking, the production?

Q. Yeah. Is that condensate and water?

A. No, that is just condensate.

Q. So you need to downhole commingle to get a half a barrel of fluids out?

A. It helps us lift the fluids. A lot of times we'll get some log off of that bottom zone, and adding the additional gas will help us to lift the fluids out of these wells.

We've seen that as kind of an added benefit of a lot of the commingling that we've been doing, and it seems to actually help these wells produce a little bit better.

Q. So is that really a problem with these high-pressure wells, lifting a half a barrel a day out? Is that a problem?

A. No, but it just helps -- I would not say it's an extreme problem.

In this well you'll note that we've had some -- or in the offsetting wells, we've had some liquid-loading problems on the Dakota side. If you look at some of the curves, you'll see some down time on them, and we've had some liquid loading.

I would not call it an extreme problem. I would call it an assistance in this well.

Q. Will this well have tubing in it?

A. Yes.

Q. And let's see --

A. It does not -- It does not at this point. At this point the schematic shows it as it is set up, with the exception that there is a bridge plug over the Dakota right now, so that the formations do not mix prior to our having commingling approval in this wellbore.

Q. And what size of tubing will it have?

A. 2 7/8.

Q. And set to what depth?

A. I can't tell you specifically. My --

Q. Will the production be coming out of the tubing, or is that -- Will it be utilized to lift the fluids?

A. There will be gas coming up the tubing as well. We typically get some movement with the condensate up that.

Q. Now, there will be no packer set down there at the --

A. No, sir. But as I said, we have it bridge-plugged off at this point.

Q. At what point in the life of these wells usually does that half-a-barrel-a-day liquids production start becoming a problem on some of these other wells, or are they producing more liquids than a half a barrel?

A. Some of them are producing more, but the majority of them are producing less than that. It has -- Again, I said it has not been a big issue. It's probably an assistance that we get in this.

You know, we're in a pretty marginal area here. We have fairly good IPs on these wells. But you know, as we look at what we anticipate our production is going to be off this, we're going to have around 60 to 70 MCFD out of each side. So from the standpoint of justifying this well, we needed both of these formations to put a well here.

Q. I'm sorry, you need what, now?

A. We needed both of these formations to put a well here. And in fact, you know, the commingling is an added savings to us to justify that wellbore.

Q. Which would result in a longer producing well?

A. Yes. In this case it would probably result in a producing well. These are -- The economics on this well are pretty skinny.

Q. Would assuming that the deliverability doesn't get taken away like you claimed previous in the other case -- which again I haven't heard of, nobody has approached me on it, nor have I seen a case or a hearing --

A. We were approached by --

Q. -- requesting such thing. Like I said, I haven't seen such request --

A. Yes.

Q. -- or been privy to it or anything. So until that time comes, or if it doesn't come, how is prorationing of this well, since both zones are prorated, going to be affected? Assuming, like I said, deliverability stays on like it currently is in the rules and regs, pursuant to 8170.

A. Right, and we would treat it like any of our other wells under that, that have been commingled out here. We would still be required to do the deliverability testing.

Q. Are those done separately?

A. Yes, they are.

Q. How are those done separately?

A. We are setting packers to do that.

Q. Is it done on an annual basis?

A. No, it's done on a new-well basis, and after you've gotten to a certain point then you're only required to do it on an infrequent basis. So initial to the life of a well, we're doing the deliverability testing a little more frequently.

Q. Has this one had that test performed?

A. Not yet. It will prior to -- Right now, as I said, we have the Dakota behind pipe, and we will do the testing, we'll stab in with the packer and do the testing on the Dakota and then on the Mesaverde, prior to doing that.

Q. So again -- forgive my ignorance -- it is still required?

A. It is.

EXAMINER STOGNER: Okay.

Any other questions of this witness?

MR. CARR: No questions, Mr. Stogner.

EXAMINER STOGNER: You may be excused.

Anything else further in Case Number 11,645?

MR. CARR: That concludes our presentation in this case.

EXAMINER STOGNER: This matter will be taken under advisement.

(Thereupon, these proceedings were concluded at 1:09 p.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11645, heard by me on November 7 1996.

Michael E. Stogner, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL November 16th, 1996.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998