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 MARATHON OIL COMPANY TO AMEND THE SPECIAL RULES AND REGULATIONS FOR THE TRAVIS-UPPER PENNSYLVANIAN POOL, EDDY COUNTY, NEW MEXICO

CASE NO. 11,964

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

April 16th, 1998

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday, April 16th, 1998, 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

April 16th, 1998
Examiner Hearing
CASE NO. 11,964

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* * *

WHEREUPON, the following proceedings were had at 9:40 a.m.:

EXAMINER STOGNER: At this time I'll call Case Number 11,964.

MR. CARROLL: Application of Marathon Oil Company to amend the special rules and regulations for the Travis-Upper Pennsylvanian Pool, Eddy County, New Mexico.

EXAMINER STOGNER: Call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing in association with Tom Lowry, a Texas attorney and house counsel for Marathon Oil Company in Midland.

We represent the Applicant in this case, and I have two witnesses to be sworn.

EXAMINER STOGNER: Any other appearances?

MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe, representing Ocean Energy, Inc.

I'm just entering an appearance today in support of Marathon's Application.

EXAMINER STOGNER: Do you have any witnesses, Mr. Bruce?

MR. BRUCE: No, sir.

EXAMINER STOGNER: Any other appearances?

Will the witnesses for Marathon please stand to be sworn at this time?

(Thereupon, the witnesses were sworn.)

MR. KELLAHIN: Mr. Examiner, you have before you Marathon's exhibit package. Exhibit 1 is a locator map.

There's a color code on Exhibit 1 that describes the area.

Outlined in pink is the current pool boundaries for the Travis-Upper Penn Pool. It's an oil pool spaced on 80-acre spacing. It's operated under special pool rules since 1978. There are still remaining about five producing oil wells in that pool.

What we're seeking to do is to change for this pool the gas-oil ratio. It currently is 2000 to 1. The depth bracket oil allowable is 355 barrels a day. We're asking permission to increase the gas-oil ratio to 7000 to 1.

In addition, we're asking that you approve the flexibility so that future wells can be drilled 330 from the side boundaries of those spacing units.

The Exhibit 1 shows the Crockett and Buchanan wells, which are the two new wells that Marathon has drilled, and they will be the subject of our presentation.

With that introduction, we would call Mr. John Chapman.

JOHN J. CHAPMAN, JR.,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A. My name is John J. Chapman, Jr. I am an exploration supervisor for Marathon for all geologic efforts in the State of New Mexico.

Q. Do you hold a technical degree, Mr. Chapman?

A. Yes, I do.

Q. In what field?

A. In petroleum geology, or geological engineering.

Q. On prior occasions have you qualified before the Division as an expert in the area of petroleum geology?

A. Yes, I have.

Q. And as part of your duties as a geologist for your company, have you made a study of the geologic factors involved in this case?

A. I and those under my supervision have, yes, sir.

Q. As a result of that study, do you now have conclusions, recommendations and opinions for the Examiner?

A. Yes, sir, I do.

MR. KELLAHIN: We tender Mr. Chapman as an expert

geologist.

EXAMINER STOGNER: Mr. Chapman is so qualified.

Q. (By Mr. Kellahin) Mr. Chapman, let's set aside Exhibit 1, the locator map, for a moment, and we'll keep that as a reference.

Let me draw your attention to two displays and ask you to first look at what we've marked as Exhibit 2, which is a cross-section. And as we do so, I'll also ask you to look at Exhibit 3, which is your structure map.

A. Okay.

Q. When we look at Exhibit 2, can you identify for the Division what is the top and the bottom of the interval currently being produced by the two Marathon wells, plus the interval historically produced in the existing Travis-Upper Penn Pool?

A. Yes, I can. Exhibit A-A' is a cross-section from the two new Marathon wells, moving in a northeasterly fashion, including two of the producing wells from the existing Travis-Upper Penn Pool, and two horizons that are marked.

The first one, that is labeled as "datum", is the top of the gross producing interval, and all wells involved in the Travis-Upper Penn Pool -- we, on -- with further work believe that this is the top of the Canyon interval.

The lower marked interval is the base of the

Canyon carbonate interval.

Q. It doesn't show a label on it; it's the horizontal line farther down on the display?

A. Yes, approximately 150 feet downsection.

Q. And that represents what, sir?

A. The base of the Canyon carbonate interval.

Q. When we look at the particular zone within the Canyon that is being produced in Marathon's Buchanan well and Marathon's Crockett well, where would we find that interval?

A. It is -- The perfs are marked on all wells on the cross-section, and all perforations fall between the two horizons I have previously noted.

Q. Is it generally agreed upon by you and other Marathon technical personnel as to what portion of the perforated intervals are actually contributing hydrocarbons?

A. Yes, it is. And Mr. Williams, who will follow me, will have very specific testimony along those lines. I will point out at this point in time that the perforations are as is marked.

On that same set of cross-section there are two -- on the two Marathon wells, are intervals that are highlighted in yellow. By production log testing, all current production is coming from those marked set of

perforations, or essentially all.

Q. Let me move your attention to Exhibit 3. When you define this as a structure map, tell us the point on the cross-section that you're using to map the structure.

A. All right. This structure map is made on that horizon that we have labeled as "datum" on the cross-section A-A', the top of the Canyon interval.

If I may clarify at this point, the Travis-Upper Penn Pool is simply designated as Upper Penn, a fairly generic geologic designation which generally encompasses both the Canyon and Cisco. All fields within the pool actually produce from this same more discrete geologic interval which we -- As I previously stated, on review we believe that this point is Canyon.

Q. When we look at the area identified in Exhibit 3 with the pink outline, that defines the existing current pool boundaries, does it not?

A. Yes, it does.

Q. Give us a geologic summary of the kind of reservoir being produced historically by the wells in the existing pool.

A. Okay. As noted by both the cross-section and the structure map, it is a fairly consistent interval geologically that is produced. The total structural range on top of the interval is 100 feet.

All these wells -- All producing wells lie essentially on strike.

As also is shown on the structure map, it is not contained by structural closure. It is not a structurally trapped field.

These are Pennsylvania carbonates, which are amalgamated algal mounds, as are most Pennsylvanian carbonates in southeast New Mexico, and it is a linear, strike oriented, stratigraphic trend.

Q. The Buchanan and Crockett wells were originally targeted for another formation, were they not?

A. Yes, they were.

Q. What formation were they drilled and attempted to produce from?

A. These wells were drilled to the Morrow, actually topping the very top of the Chester or uppermost Mississippian. They were drilled with the intention of testing the Morrow.

Q. And were you able to successfully complete these wells in the Morrow formation?

A. No, neither one of these wells encountered productive quantities of Morrow sand.

The Crockett was initially completed in an Atokan sand, which came on at a good rate but rapidly declined, was a very limited reservoir.

The Buchanan was initially completed in a Strawn carbonate, which likewise depleted rapidly.

Q. When those two wells were completed, is it your understanding that they had an initial pressure that was less than what would be expected to be virgin pressure for wells at this depth in the Canyon?

A. In the Canyon, yes, that is correct.

Q. Were you asked to examine to see if you could come to a geologic conclusion as to the reasonable probability of where that pressure depletion had occurred for those two wells?

A. Yes, we were. We examined that question, and the obvious answer is the Travis-Upper Penn Pool lying to the northeast of our wells, which have produced considerable quantities of oil and gas.

Q. In looking at the cross-section and the structure map, give us a summary, then, of why you have concluded geologically that the Buchanan and Crockett are connected to the Travis pool.

A. Referring first to the cross-section, Exhibit 2, you can see by the correlations that this is a fairly consistent gross interval.

All these logs are porosity logs, they all contain a gamma-ray log, and on the leftmost track for the individual wells you can see that whereas the total

quantity of carbonate may vary somewhat, the relative position of carbonate is consistent between all four producers, indeed by all wells in the Travis-Penn field.

So it is a uniform stratigraphic interval. The perforated intervals that Marathon has completed in are correlative stratigraphically to those same intervals that have produced historically in the Travis-Upper Penn field areas.

Q. When the engineers have looked at the engineering data with regards to the old Travis Pool and the Buchanan and Crockett pool to determine to what extent they're connected, and if they have concluded that there is a weak connection, is there geologic information available to you to support the magnitude by which these wells may be connected?

A. Yes, there is. If I may take us now to Exhibit 4, with your permission --

Q. All right, sir, identify and describe what this display is.

A. Exhibit 4 is an isopach map of the net porosity in this same stratigraphic interval, the Canyon carbonate. It is a map of the net porosity exceeding two percent as a cutoff.

And what this map displays is a trend very similar to the structural trend previously noted. It is a

bound stratigraphic system. There are wells both updip and downdip which had no porosity in the interval.

And the -- All wells carry a very consistent and strong trend as far as presence of porosity. You may note that the amount of porosity encountered in the Crockett and Buchanan -- Marathon Crockett and Buchanan wells, is very consistent with a typical porosity -- amount of net porosity encountered in the historical field.

And all this maps as continuous or semi-continuous with that control that is currently available.

Q. Are you able to reach an opinion with regards to supporting the engineering conclusion that there is a weak connection pressure and -- pressure connection between the existing pool and the two new wells?

A. Yes, it's my contention that the combination of the pressure data and the geological data make a very strong argument that the two new wells are connected to the historical Travis-Upper Penn field.

Q. Have the engineers advised you that based upon their analysis of the performance of the wells, they do not see a gas cap in the reservoir?

A. Yes, they have advised me of that.

Q. Do you find geologic support for that engineering conclusion?

A. Yes, that's very reasonable.

Both the productive behavior of the existing wells in the existing field and the producing behavior of the two recent Marathon completions, and the relationship to structure -- everything consistently says that all perforations are producing both oil and gas and that there is no segregated free gas cap in this pool.

Q. Is it your understanding that Marathon personnel have met and visited on several occasions with the District Supervisor of the Division in Artesia, Mr. Tim Gum?

A. Yes, that is correct.

Q. As a result of those conversations, is it your understanding that there is an agreement with the District Office and Marathon as to how to extend the pool boundaries of the Travis Pool to include sufficient acreage to link the Crockett and the Buchanan wells to the old pool?

A. Yes, that agreement has been reached with Mr. Gum, and it is as posted on all maps included in our exhibits, the blue outline, which ties contiguously the two new wells with the existing pool.

Q. All right. My question for you, sir, is, if the Division approves the blue acreage as an extension of the Travis Pool, is that logical geologically?

A. It's very logical and reasonable.

Q. Currently, the Crockett well is dedicated to an 80-acre spacing unit consisting of the north half of the

southwest quarter of 27; is that true?

A. That is correct.

Q. And the Buchanan well is dedicated to the north half of the southeast quarter of 33?

A. That is correct.

Q. Are you -- Is Marathon pursuing further opportunities to drill additional Canyon wells that would be subject to the special rules for this pool?

A. Yes, Marathon plans to aggressively pursue the development of this field and has plans -- It's currently drilling -- has two wells drilling currently in this trend, general trend, and has plans for offsetting both the Crockett and Buchanan wells for the canyon.

Q. In picking future well locations, can you describe for me, Mr. Chapman, what would be your geologic strategy in locating wells at the optimum position within these spacing units to give you your best opportunity to maximize oil production from the Canyon?

A. Marathon's plan for the development of the Travis-Upper Penn Pool is to utilize 3-D seismic to define optimal locations, geologic locations to locate Canyon tests.

Marathon, as have a number of other operators in the State of New Mexico, has had success at utilizing 3-D seismic in optimizing locations, and indeed we are in the

process of acquiring a 3-D seismic program that covers the southwestern extension of the Travis-Penn, Upper Penn, Pool.

Q. What accounts for the accumulation of hydrocarbons at points of greatest thickness within these small features we see mapped on Exhibit 4? What kind of creature is this?

A. What kind of creature is this? These are algal mounds similar to that which is found throughout the Strawn, Canyon and Cisco in southeast New Mexico.

In this case we refer to them as a shelf margin complex, in that you had a fairly high population density of these algal mounds, as opposed to some of the more isolated mounds in the Strawn, for example, in the Lovington-Strawn field areas.

Whereas the population density is high enough that they are generally connected, there is still a high degree of variation in the net thickness of the algal mounds, which will have an impact on the initial rates at which these wells will produce.

If I may draw Mr. Stogner's attention to the isopach map, located in Section 14, location P, the southeasterlymost location in Section 14, that particular well encountered 34 feet of net porosity.

If you move down the heart of the strike in a

southwesterly direction, you can see that the next well drilled encountered only 18 feet of net porosity.

The next well to the southwest encountered 38 feet and, continuing down the trend, 24 and 10 and 12. So you can see there's a great deal of variation.

Within the heart of this productive trend there's a great deal of variation within the thickness of the net porosity, i.e., the net reservoir quality, and that reflects itself in the rate at which these wells will produce, and thereby impacts the economics of drilling and developing such a pool in a manner that is not wasteful.

Q. Do you understand that the current rules for this pool that were adopted in 1978 require that standard well locations have wells located within 150 feet of the center of either 40 acres that's dedicated to the spacing unit for that well?

A. I do understand that.

Q. Do you have an opinion as to whether or not it will be useful to you and other operators to have more flexibility in well locations whereby this -- well locations could be within a spacing unit, so long as they're no closer to a side boundary than 330 feet?

A. It will be very useful. It will avoid the wasteful drilling of unnecessary wells. It will allow Marathon and any other operators in the pool as it develops

to optimize locations and thus receive the best return both for themselves and for the State of New Mexico, utilizing such tools as 3-D seismic.

And what we are asking for is the standard and typical standoff rules for a normal quarter-quarter location.

Q. Under the existing rules, you'll be required to file, either for hearing or for administrative processing, requests for unorthodox well locations to accommodate your objective of locating wells at the greatest thickness of these algal mounds, and you would still have that opportunity if the rule was not changed?

A. That is correct.

Q. And your request is to make the change in the special pool rules?

A. That is correct.

Q. Is it your understanding that that request has been made to Mr. Tim Gum and we have been advised that he has no objection to the additional flexibility in the pool?

A. That is my understanding.

MR. KELLAHIN: Mr. Examiner, that concludes my examination of Mr. Chapman.

We move the introduction of Exhibits 1 through 4.

EXAMINER STOGNER: Exhibits 1 through 4 will be admitted into evidence.

EXAMINATION

BY EXAMINER STOGNER:

Q. You have given a very concise general description of what this pool was in being an algal mound. Could you repeat that for me?

A. Right, the original definition of the pool, in the original field rules, they simply used the term "Upper Penn", which has been frequently utilized. That term has been used because the stratigraphy of the Pennsylvanian, the upper Pennsylvanian, is somewhat complex.

However, all producing wells in the field, both historical and the two new Marathon wells, are all producing from this same interval, roughly 150 feet gross interval, that is found, we believe, within -- Our correlations say that we believe this is the Canyon portion of the pool.

It is a strike parallel shelf margin complex, very similar to those found in numerous other fields in New Mexico. Example, Dagger Draw complex, Indian Basin and others that are productive out of the Canyon or Cisco.

The geologic makeup of that portion of the carbonate which is productive, these are algal mounds, calcareous algaes that grew on the -- at a certain water depth and energy regime in the Pennsylvanian seas and developed mounds.

In some portions of southeast New Mexico they tend to be quite isolated -- for example, in the Strawn of the Lovington area, as previously cited.

In the Canyon and Cisco they were somewhat more robust and tended to be somewhat amalgamated. Therefore you get pressure, permeability, drainage, connection between these amalgamated algal buildups.

Q. Now, have you -- Are you the one that's been in contact with Mr. Gum concerning the extension of this particular pool?

A. No, I have not been personally in contact with Mr. Gum.

Q. Okay. But somebody within your company has?

A. Right, there have been numerous contacts, usually involving the engineering supervisor, Dave Barker, and two or three of the engineers who report to him and some other miscellaneous Marathon field people located in our Hobbs office, et cetera.

Q. Okay, the area marked in blue on your maps, that is the area in which Marathon understands that Mr. Gum is to at least include within the extension of this pool?

A. That is correct.

Q. And that doesn't necessarily reflect your understanding of what the actual pool extension is to be, is it?

A. Right, not at all. You know, currently, the mapping of the limits of the pool is simply done on the basis of subsurface date, i.e., well logs.

And you can see in the southern end of the pool where Marathon has been drilling these Morrow tests, the data is quite scattered. Generally one or two data points per 640-acre section.

And so the ability to well define the limits of the pool in advance of drilling, at the present time, is somewhat limited.

You can see from my isopach map, Exhibit 4, I have theorized that the pool will be developed further to the north and to the west and -- you know, crudely outlining the area that is shown in blue. At that point that's just a conjecture, a geologic -- It's hopefully a reasonable geologic conjecture, but it's conjecture on our parts.

The two wells currently only hold their 80-acre proration units in the Canyon. What Mr. Gum has done is -- in conversation with Marathon, is attempted to link up these two 80-acre units with the field in a contiguous fashion.

Q. Okay. When I refer to Exhibit Number 4, you show some -- and I'm looking in Sections 23 and 27. There appear to be two other wells just --

A. Right.

Q. -- to the south and east of your A-A' line --

A. Right.

Q. -- and they both have 12 foot shown. Are these deeper Morrow producers or something that have penetrated the zone?

A. Those are both -- yes, both the -- The two wells in Section 23 -- there's one well on location N that has 12 feet. There's another well up in location C which has NLA; the log for that well has not been released as of yet. Both of those wells are Morrow producers.

And then the other well you referenced in Section 27, in location H, is also a Morrow producer. Both of those wells had 12 feet, relatively thin amounts of net porosity, and the operators of those wells have not thus far elected to attempt completion in the Canyon.

Q. And then you have a well way, way down there in the very end of your structure, and that has a footage of 25.

A. That's correct.

Q. That's in Section 4. Is that a similar deeper-horizon produced well?

A. Yes, that well has produced out of -- I'm pretty confident in saying that well has produced out of the Morrow and some other -- If I may refer to my notes.

That well initially completed in the Morrow, back in 1971, which I would note predates the discovery of the Travis-Upper Penn Pool, so this pool was not recognized yet at that point in time. It produced out of the Morrow for a fairly brief history and then was recompleted uphole in the Queen-San Andres, much shallower objectives. And to the best of my knowledge, it's still actually producing out of the Queen-San Andres.

Q. Okay, when I refer to your cross-section -- that's Marathon's Exhibit Number 2 -- the two wells to the far left, what is the little yellow mark in which you have designated on these cross-sections?

A. The yellow mark -- All perforations are marked by the boxes with circles in the center track. After Marathon had -- and this will be -- greater testimony to this will be given later by Mr. Williams. After these wells were perforated and put on production, Marathon ran production logs in both of these wells, and the vast majority of the current production is coming from those discrete sets of perforations out of the complete composite appropriations that Marathon put in those wells.

Q. Now, my records indicate that this is -- well, somewhat of an old pool. It was discovered back in 1978; is that correct?

A. That's correct. Well, 1977, it was discovered

and I think the initial pool rules applied for, and then -- temporary pool rules applied for, and then I think the first permanent rules came out in 1978, if I remember correctly.

Q. Actually, the hearing was in 1977, and the pool rules came out in February of 1978, and that's by Order Number R-5643 in Case 6072, which I'm taking administrative notice of, by the way.

Those original wells in that original pool boundary, in your pink area shown -- Now, you said the production is from the Canyon portion in this structure. Were there other perforations in that Cisco and the more vertical extent of that Canyon formation, or has this always been just the -- produced from the Canyon?

A. All records available that Marathon has examined says all perforations have been in the Canyon. Again, as I previously referred to, the stratigraphic correlations, how discrete is the Canyon/Cisco at times, is arguable, and therefore when this pool was originally discovered, while Heyco was drilling a deeper test for the -- I believe also the Morrow, they simply refer to it as Cisco -- excuse me, as upper Penn, and that was accepted and has been carried forth at this point in time.

But according to all records that we've been able to review, all perforations have been in this Canyon, this

150-, 180-foot gross interval of the upper Penn.

Q. It looks like development of this pool has been kind of slow over the last 20 years. Do you have any reason why or any estimation why?

A. Well --

Q. I mean, even looking -- The reason I say that, I look back at the records of the pool extensions, which originally start in 1978, 1979, 1981, 1982 and then again in 1984 and 1994, which is somewhat -- over a 20-year period.

A. Yes. Of course, let me preface my comments with, Marathon has not been an interest owner or operator in the existing pool, so we've had no part with the current historical development. However, I think it's a combination of a couple of things.

These carbonate algal mound complexes are often very subtle to detect on logs, because most of the porosity is secondary, i.e., vuggy in nature. So it doesn't always show up real well on logs, you don't always get good shows drilling through it. So it's a subtle and difficult play to detect and pursue.

I believe all these wells have also had a fairly -- I'm probably getting out of my depth here. I think these wells have also experienced a fairly significant decline, sufficient such that when 1985-86

rolled around and prices began to decline, the operators cooled their heels and either have forgotten about or simply elected not to pursue it.

And I would again note that Marathon's extension to this pool were found while drilling for the Morrow.

Q. So it seems there may be some correlation of oil prices and the development of this pool, just to --

A. Just on the basis of conjecture, it --

Q. It would appear that way.

A. It would appear that way.

Q. Now, you said that the pressure -- Or am I to assume that your next witness may go a little bit more into the pressure?

A. He would be --

MR. KELLAHIN: We'll have a full presentation on pressure.

THE WITNESS: Yeah, he'd be better qualified to testify to that.

EXAMINER STOGNER: Okay.

THE WITNESS: Geologists are always under pressure, but never give pressure.

EXAMINER STOGNER: All right. I have no other questions of this witness. You may be excused. Thank you, sir.

THE WITNESS: Thank you.

MR. KELLAHIN: Our next witness is Mr. Paul Williams. Mr. Williams is a reservoir engineer.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: Thank you, Mr. Examiner.

PAUL R. WILLIAMS,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Williams, for the record, sir, would you please state your name?

A. My name is Paul R. Williams.

Q. And where do you reside?

A. In Midland, Texas.

Q. And have you on past occasions testified before the Division?

A. I have not.

Q. Summarize for us your education.

A. I have a BS in petroleum engineering from Colorado School of Mines, achieved in 1989.

Q. What is your current employment with Marathon?

A. I am a petroleum engineer.

Q. As part of your duties as a petroleum engineer, have you made an investigation of the performance of the Crockett well and the Buchanan well?

A. I have.

Q. In addition, have you studied the performance of the wells in the old portion of the Travis-Upper Penn Pool?

A. I have.

Q. Have you, to the best of your knowledge, studied the available engineering data and come to some engineering conclusions?

A. I have.

Q. Do those conclusions and opinions include an opinion concerning an appropriate gas-oil ratio for the pool?

A. Yes, they do.

MR. KELLAHIN: We tender Mr. Williams as an expert witness.

EXAMINER STOGNER: Mr. Williams is so qualified.

Q. (By Mr. Kellahin) Let me have you direct your attention to what we've marked as Marathon Exhibit Number 5. This is a display that shows initial reservoir pressures.

On this display you have located all the existing or former wells in the Travis Pool, have you not?

A. Yes.

Q. And have you located and provided information on pressure for the Buchanan and the Crockett well?

A. Yes.

Q. What kind of pressure data are we looking at here?

A. We're looking at pressures, as far as the Travis-Upper Penn field, that were obtained from State records. Usually these were DSTs performed, and they were pressures obtained from these DSTs.

Q. Let's take this Exhibit 4, and while we -- I'm sorry, Exhibit 5. And while we look at Exhibit 5, let's also look at your plot of these initial pressures over time, which is displayed on Exhibit Number 6.

First of all, going back to Exhibit 5, show us what in your opinion would be the original reservoir pressure, virgin pressure, for the first well in the Travis Pool.

A. I would like to point to the well in Section 13, Unit Letter G. We have a well that encountered pressures of 3812 pounds, and I believe this is the first well in the pool, and this pressure was encountered in 1977.

Q. When we go to Exhibit 6, then, and look at the chronology of the initial reservoir pressure points, find the interval from January, 1977, to January, 1978, and look above the column where it says 3500 pounds, that red square represents the data point for the well you've just described?

A. That is correct.

Q. And have you gone through Exhibit 6 and plotted the other initial reservoir pressures for these other wells in the same fashion?

A. Yes.

Q. What's your conclusion?

A. We find that these wells encountered virgin pressures of approximately 3800 pounds initially. And as other wells were brought on and produced, this pressure declined over time. It declined rapidly over the first five years and then seems to have stabilized over the next period of approximately 15 years.

Q. With knowledge of Mr. Chapman's geologic conclusions, and with the information you have about initial reservoir pressures, do you have an engineering explanation for the scattered nature of these initial reservoir pressures for the wells that preceded the Buchanan and Crockett well?

A. We believe that these wells -- this reservoir pressure, there is some connection across the field, and this pressure declined fairly rapidly initially, through the connection that Mr. Chapman has pointed out from our wells to the Travis-Upper Penn.

Q. Did you find evidence of some interference or pressure connection, if you will, between or among wells in the old part of the pool?

A. Yes, we have identified two wells that appear to be in communication in the Travis-Upper Penn field.

Q. Show us the wells on Exhibit Number 5.

A. Those wells would be Section 14, Unit Letter P, and then the well due south of that, Unit Letter B in Section 23.

Q. When you look at the reservoir pressures, you can also find wells that are positioned where they seem to have minimal effect one to another? When we look at Exhibit Number 6, there's a well that comes in at a low pressure, between 1980 and 1981? Do you see it? Just over 2000 pounds?

A. Yes.

Q. And then yet you come back in 1982 and there's another well up above 2500. The scattered nature of the pressure is what I'm talking about.

A. Uh-huh.

Q. Is there an explanation as to the scattered nature of the pressures?

A. It would be -- Well, two answers here. Partially, the reservoir connectivity is not very solid. There is some connection, although there is some heterogeneity to these carbonate reservoirs.

The other explanation here is that these are pressures garnered from a drill stem test, and not having

access to the specific information, we can't verify that these are very accurate tests. They're the best we have at this time.

Q. Let's now compare the pressure data you have for Buchanan and Crockett, and compare that back to the pressures you had for the pool. What do you see?

A. We see that our initial reservoir pressures at Crockett and Buchanan are approximately the same as the latter wells that were developed in the Travis-Penn field. We're seeing pressures approximately between 2300 and 2400 pounds, which is about the same as the well drilled in 1991, and this was a DST taken of this well in Section -- I'm sorry, Unit Letter F of Section 23.

Q. Is it your opinion that the Buchanan and Crockett wells have suffered some pressure depletion --

A. Yes.

Q. -- prior to the time they were drilled?

A. Yes, I believe so.

Q. Do you have an engineering conclusion as to the place or point at which those spacing units were pressure depleted? What's the source of the depletion?

A. I believe it's just the production over time, over a period of approximately 15 years here.

Q. And the production attributed to the Travis Pool?

A. Yes.

Q. Do you see any other probable source for that depletion, other than the Travis Pool? That's the logical source, is it not?

A. Yes, in this case, yes.

Q. Do you see any evidence that there was an original gas cap in the reservoir?

A. No, we do not.

Q. Do you see any problem with increasing the gas-oil ratio in the pool?

A. No, we do not.

Q. All right. In fact, you see just the opposite?

A. Yes. We have a well here, again, in Section --

Q. Go ahead. In fact, I think that's the next display. Let's look at Exhibit Number 7 and talk about what is the producing GOR for the wells in the pool that are still producing. Describe that display for us.

A. You can see that the wells in Section 13 at this point have shut in. They've been depleted, and the more recent wells are in Section 23, and you can see lower producing rates.

But I would like to point to the producing GOR for the well in Unit Letter F of Section 23 and point out that the producing GOR there is over 7500.

Q. And how does that compare to the producing GOR for your two wells?

A. That is higher than what we're seeing at our Crockett and Buchanan wells. Our Crockett has a producing GOR of slightly over 7000, and Buchanan is at approximately 5000.

Q. You've also given us Exhibit 8. Let's have you identify that so that it's in the record. What have you tabulated on Exhibit 8?

A. Exhibit 8 is just a tabulation of the cumulative production from the Travis-Penn field. These wells are identified by location. We also have current monthly production, upper and lower perfs, completion date, reservoir pressures and dates that these wells were shut in.

Q. Let's turn now to the Buchanan well, and let's talk about whether or not you have an opinion as to an appropriate gas-oil ratio for the pool based upon data you've derived from the Buchanan well. Do you have that data?

A. Yes, I do.

Q. What are we looking at? What kind of data is this?

A. This is actual measured data, daily gauges obtained from the field.

Q. All right, what are you trying to do?

A. We are looking on Exhibit 9 at a plot of oil rate

versus gas rate. We're just trying to indicate -- doing step-rate tests to see what happens to the effect of gas rate as we affect the oil rate.

Q. You as an engineer are having the field people conduct a series of step-rate tests to give you data so that you can see what is the most efficient rate at which this well wants to perform?

A. That is correct.

Q. The current rule is 2000-to-1 GOR at 355 barrels a day, right?

A. Yes.

Q. And that gives you a maximum daily gas allowable of what, sir?

A. 710 MCF per day.

Q. All right. Are you satisfied that you had adequate step-rate tests?

A. Yes.

Q. When you look at a step-rate test that you want to use as an engineer, what do you look to see about that test to make it reliable for you?

A. I want to ensure that we achieved stabilized production during that test period.

Q. For this particular well, that stabilized production was achieved within what time period?

A. A minimum of 24 hours.

Q. So the data points we're looking at here are stabilized data points?

A. Yes.

Q. And for each of the data points, how was that represented on Exhibit 9?

A. They are indicated with this blue triangle.

Q. All right. Let's go down and look at the curve you've drawn, the black curve.

A. Uh-huh.

Q. What does that represent?

A. That represents a best-fit curve through the data points we have indicated on here.

Q. And what does that mean?

A. Just the minimum variance from the overall scatter of the points. It's a --

Q. That's a typical engineering way to analyze the step-rate data, is it not?

A. Yes.

Q. All right. Once you have that curve on the map -- or on the display -- you have posted in the lower left corner two red lines, a vertical red line and a horizontal red line. What does that mean?

A. The horizontal red line represents our current pool rules for 2000 GOR. It comes in at 710 MCF per day. As that well intercepts our best-fit line, we then drop

down to get a corresponding oil rate of approximately 105 barrels of oil per day.

Q. All right. So if you're required to constrain the well to the existing pool rules, the 2000 to 1 --

A. Yes.

Q. -- it means that this well will only perform at a level where you can achieve 105 barrels a day?

A. That's correct.

Q. Okay. As you go through the step-rate test and find the most efficient manner in which to maximize oil recovery, what rate would that be?

A. I'd like to point out in this red section, this calculation here is approximately 7000 GOR. As we step up the curve further to this 355 barrels per day, the green vertical line, we intercept this best-fit curve and we come over to a corresponding gas rate of approximately 1700 MCF per day. This calculation shows that there's a GOR of about -- under 5000 at this point.

Q. Now, that's a producing GOR?

A. That's correct.

Q. And so the other one is also a producing GOR?

A. That's correct.

Q. All right. So when we find the rate at which this well likes to perform most efficiently, what rate would that be?

A. That rate would be greater than 300 barrels per day, of oil.

Q. Okay. In order to allow this well to produce its current top maximum depth bracket oil allowable of 355 a day -- we're not changing that rule --

A. Correct.

Q. If that's your ceiling for oil --

A. Uh-huh.

Q. -- what is an equivalent gas volume that lets you maximize this oil production?

A. It would be at a rate of approximately 1700 MCF per day.

Q. Okay. Translating this into the pool rules, would this well benefit if the pool rule is changed to 7000-to-1 GOR?

A. Yes.

Q. And you could allow, then, this well to perform at its optimum?

A. That's correct.

Q. Let's look behind that and see how you have displayed this data in a different format. On Exhibit 10, identify and describe what we're looking at here.

A. Exhibit 10 is the same data we saw on Exhibit 9, however we've plotted oil rate versus this gas-oil ratio. And you can see that at the higher rates we have a lower

producing GOR. And as we attempt to step the well back and lower the oil rate, you can see that the GOR starts to climb.

At this 355 barrels of oil per day, we get a corresponding producing gas-oil ratio of approximately 5000. If we were to restrict that in the range of 100 MCF per day, you would see that our GOR would climb to something up over 7000 GOR.

Q. Again, just another way to display the information. The conclusion is what?

A. The conclusion is that the producing GOR is lower at the higher oil rates.

Q. You have also provided a plot of the various substances being produced by the well, and you've shown it on Exhibit 11?

A. Yes.

Q. All right, let's look at Exhibit 11. Describe for us what we're seeing.

A. Exhibit 11 is just a production graph of the data obtained from the Buchanan well over time, and we've just plotted our oil rate, gas rate and water rate, and then our calculated gas-oil ratio.

Q. The production is interrupted from about March 19th to about March 25th, there's an interruption or break in the production. What occurred?

A. We achieved our maximum allowable for the month at that time --

Q. Yes.

A. -- and the well was shut in.

At the time we shut the well in, we also performed a pressure buildup.

Q. All right. This well was shut in because you were at the point where you were exceeding the current maximum gas allowable, and then it was turned back on when the Division gave you temporary approval to continue production?

A. That is correct.

Q. During this break in production, you said you ran a buildup on the test?

A. Yes.

Q. What was done?

A. We ran pressure bombs across the perforations and performed a pressure transient analysis.

Q. You can use that pressure transient analysis information to give you data by which you as an engineer can calculate at least the minimum distance at which you're producing hydrocarbons out of the reservoir?

A. That's correct.

Q. A minimum barrier, if you will?

A. Uh-huh.

Q. All right. Have you calculated that for the Buchanan well?

A. Yes.

Q. And when we look at that as a radius in footage, how far out have you reached with that pressure buildup in the Buchanan well?

A. We see a minimum radius around Buchanan of 1600 feet.

Q. Would that radius of contribution of hydrocarbons in the Buchanan well be large enough to encompass an 80-acre spacing unit?

A. Yes.

Q. What does that tell you about 80-acre spacing, at least insofar as the Buchanan well is concerned?

A. That 80 acres is sufficient, is sufficiently drained by these wells.

Q. All right. And there's certainly no point in putting this well on 40-acre spacing?

A. Correct.

Q. All right. Let's turn now to the subject of the Crockett well. For the Crockett well, do you have similar data using step-rate tests?

A. We do.

Q. Let's look at Exhibit Number 12 and have you identify and describe what you are showing in Exhibit 12.

A. Exhibit 12 for the Crockett well is the oil rate versus gas rate and the step-rate tests we performed for this well over time. Again, we have this best-fit curve generated through the data.

Q. If this well is restricted to the current GOR, what is the forecasted oil production on a daily basis?

A. If we restrict this well to the current allowable 710 MCF per day, that would result in an oil production of about 61 barrels of oil per day.

Q. And it gives you a producing GOR of what?

A. Over 11,000.

Q. In fact, you have few data points, step-rate data points, curtailing the well at those kind of levels?

A. Yes.

Q. And why not more data points?

A. As we pinched this well back, it became very unstable and was attempting to log off. We lost our oil rate.

Q. The gas, then, is preferentially produced?

A. That's correct.

Q. And why does that occur?

A. We have a pressure differential downhole at the wellbore, and as that differential decreases by shutting the well in, the relative permeability to the gas is higher than the relative permeability to the oil, which allows it

to be preferentially produced.

Q. Is it a fair characterization to say that this well is simply not going to produce oil if we keep it at a 2000-to-1 GOR?

A. Minimal rates of oil.

Q. Yes, you're going to get some; you've forecasted maybe 61 barrels. But this well doesn't like to produce in that fashion, does it?

A. That's correct.

Q. What is the most efficient, optimum way this well likes to perform?

A. Again, it would be to increase the oil rate. I've shown here on these green lines that at the current allowable of 355 barrels of oil per day, we've got a corresponding gas rate of over 2400 MCF per day. This calculates to a producing GOR of approximately 7000 to 1.

Q. Would this well benefit if the pool rules are changed to have a gas-oil ratio of 7000 to 1?

A. Yes.

Q. Let's look at Exhibit 12 and have you show us how you've plotted the data on this exhibit.

A. Exhibit 12 -- Is this Exhibit 13?

Q. I'm sorry, Exhibit 13.

A. Exhibit 13, again, is a plot of the oil rate versus the gas-oil ratio for the same data we saw on

Exhibit 12. Again, you can see that at the higher rates the producing GOR is approximately 7000. And as we attempt to pinch this well back, the GOR climbs.

Q. Are you satisfied that your step-rate data points are reliable?

A. Yes.

Q. You selected and used the ones using the same 24-hour criteria for getting stabilized rates?

A. Yes.

Q. Okay. Let's look at the Exhibit 14, which is the tabulation of production information for the Crockett well. Let's look at that.

A. Okay.

Q. What does this show?

A. Again, this is just the production of this well over time from first production period to the current time.

Q. The interruption in production is to comply with the pool rules so that you weren't overproduced?

A. That is correct.

Q. And then it was turned back on when the Division gave you temporary approval?

A. That is correct.

Q. During that period of time, did you run a pressure buildup on this well?

A. Yes, we did.

Q. And with what results?

A. Again, as with the Buchanan, we calculated our radius of investigation, and with the Crockett well we saw a radius of investigation of approximately 2000 feet.

Q. Is that sufficient to give you contribution of hydrocarbons for an 80-acre spacing unit?

A. Yes.

Q. Let's look at after the well is turned back on in Late March of 1998. Is there any conclusions you can come to the relationship of the way these gases and fluids are produced?

A. Yes, after the well was turned back on it achieves very stable production.

Q. Is that also true of the Buchanan well?

A. Yes, it had a similar --

Q. Is that an indication that at these higher gas rates you're more efficiently producing both these wells?

A. Yes.

Q. One of the things the Division worries about in gas-oil ratio cases is if there is a gas cap in the reservoir, and that if the higher-structured wells are allowed to take reservoir energy from the pool, oil production will ultimately suffer.

In this reservoir do you see any indication of a gas cap?

A. I do not.

Q. Can you isolate for us where within the upper Penn reservoirs this production is coming from?

A. I can.

Q. And how did you do that?

A. We ran a production log on these wells during its producing period.

Q. Let's look at Exhibit 15 and have you identify the production log for the Buchanan well.

A. Exhibit 15 is a graphical presentation of the percentage of production we achieved from the Buchanan well when we performed our production log.

Q. Okay, and the perforations here from 9750 to 9760, a very short vertical distance, that's where you're getting substantially all of your hydrocarbon production?

A. Yes, greater than 90 percent of our production.

Q. Do you have any concerns as an engineer that increasing the gas-oil ratio will be harmful in any way?

A. No, I do not.

Q. Let's look at your production plot for the Crockett well. Identify and describe that display.

A. Exhibit 16 is, again, a graphical presentation of the production log results that we performed a -- when we performed a production log on this well. Again, it indicates that we have greater than 95 percent of the

production coming from a very small interval.

Q. Summarize for us, Mr. Williams, your conclusions about the necessity for increasing the gas-oil ratio in the pool.

A. By having the increased GOR rules for the pool, we are able to more efficiently produce the reservoir. Our producing GORs are lower at the higher oil rates. And we would maximize our recovery from this reservoir.

MR. KELLAHIN: Mr. Examiner, that concludes my examination of Mr. Williams.

We move the introduction of his Exhibits 5 through 16.

EXAMINER STOGNER: Exhibits 5 through 16 will be admitted into evidence at this time.

EXAMINATION

BY EXAMINER STOGNER:

Q. Were you able to substantiate your findings with your Crockett and Buchanan well, with past production from the Seventies and Eighties on the wells in the -- the original wells in the pool?

A. We do not have production log or production data from those wells. All we have is top and bottom perforations.

Q. You mean you didn't bother looking up the production data; is that right?

A. I'm sorry, I misunderstood. Yes, we have cumulative production figures from that field.

Q. Was there any indication that they had the same problems that you're faced with today on these two wells, from their production histories or from -- Did anything pop out at you that they were having the same problem?

A. No, their initial producing GOR started around 1000. And as time went along, their -- this is a producing GOR for the field, tend to decline. And now we have one well there at 7500 GOR.

Q. Okay. Now, their present production in those wells, I take it, is substantially less than what yours are --

A. Yes.

Q. -- at this point? Okay.

So the initial phase of the reservoir acted somewhat differently --

A. Yes.

Q. -- than what you're saying?

A. Their initial rates were similar, as far as oil. However, their GOR was significantly lower. It was below the 2000-to-1 allowable.

Q. I was reviewing the subsequent order issued in this matter back in 1979, Case Number 6072 Reopened, Order Number R-5643, and it provided that the operators in that

pool to provide within 12 months some sort of a study. Did you know anything of that plan or study that was performed in that pool, in that area?

A. I believe they unitized the north part of the field in an attempt for a waterflood.

Q. Okay. Did it -- Did they ever waterflood it?

A. Yes.

Q. They did?

A. They put water into Unit Letter G, Section 13, and -- in 1982, and saw immediate breakthrough in the surrounding wells.

Q. Was that any surprise?

A. No.

Q. Okay. I'm looking at Exhibit Number 17. Could you kind of go in -- or what is 17, again, showing me?

A. I'm sorry, I don't have a 17.

MR. KELLAHIN: Seventeen?

EXAMINER STOGNER: Yeah.

MR. KELLAHIN: Mr. Williams didn't sponsor this one --

EXAMINER STOGNER: Oh.

MR. KELLAHIN: -- Mr. Stogner. It represents a summary of Marathon's various contacts with all the operators of current pool wells, none of whom objected to increasing the GOR. In fact, some of them had supported

it. It was simply a summary from our records to show you we had contacted all those operators, and we have no objection for increasing or changing the pool rules.

EXAMINER STOGNER: Okay, I was thinking that referred to some other matter.

What should be the date of the -- of this proposed rule change for the GOR? Do you have a proposed date?

MR. KELLAHIN: No, sir. I think the convention is to make it the first day of the month following the entry of an order.

EXAMINER STOGNER: I didn't know if there was any special conditions or any special request to perhaps go back, retroactive, to one of the Buchanan or Crockett wells.

MR. KELLAHIN: Well, you remind me of something I have overlooked, Mr. Stogner. I think it would be --

EXAMINER STOGNER: Oh.

MR. KELLAHIN: -- appropriate not to have the wells overproduced. We have a temporary approval to produce them, and I've overlooked the fact that you're correct, we need to take this retroactive back to the date of first production of the earliest well in order not to have them shut in.

EXAMINER STOGNER: Okay. Do you have -- Does

anybody know when that date was or around?

MR. KELLAHIN: Yes, sir, I think I can look it up.

THE WITNESS: I believe our first production date was for the Buchanan well, and it is February 16th.

EXAMINER STOGNER: February 16th. So the first part of February, then, of February -- I mean the first part of February, then?

THE WITNESS: Yes.

MR. KELLAHIN: Mr. Stogner, the Buchanan's first date of production was February 17th, 1998. The Crockett's first date of production was February 25th of 1998.

EXAMINER STOGNER: Mr. Kellahin, I'm going to ask for a proposed order in this matter, and that way you can cover that --

MR. KELLAHIN: Yes, sir.

EXAMINER STOGNER: -- more accurately in that portion of it, so you can get your geologist to help, maybe, and you writing up a good geological description.

MR. KELLAHIN: We'd be happy to do that.

EXAMINER STOGNER: I'll just take administrative notice that the unorthodox location request to bring it into 330 is nothing new. It is new in Eddy County for this matter, but not for the Strawn around the Lovington area.

MR. KELLAHIN: Right.

EXAMINER STOGNER: But I'll just take administrative notice. I don't remember Marathon having any production over in that area, but I just wanted to take administrative notice of that.

Also take administrative notice of the two previous cases, of the two previous orders in that.

And if there's nothing further of this witness you may be excused.

THE WITNESS: Thank you.

EXAMINER STOGNER: Does anybody else have anything further in Case Number 11,964? Mr. Bruce? I'm sorry, Mr. Bruce, did you have anything?

MR. BRUCE: I have nothing, Mr. Examiner.

EXAMINER STOGNER: Okay.

MR. KELLAHIN: I need to introduce and explain the notice affidavit.

EXAMINER STOGNER: Okay, please do.

MR. KELLAHIN: To make that explanation I'm handing you an unmarked exhibit. We can mark it whatever the last exhibit is going to be. I've lost track of the numbers. That's 18, this one -- Let's make it 19. I need to describe for you the notice.

The affidavit is attested to by Tim Robertson. Mr. Robertson is a petroleum landman. He's testified before the Division in past cases.

If you'll turn to Exhibit A, it's a color exhibit, and I can describe for you what Mr. Robertson did.

Marathon --

EXAMINER STOGNER: You're referring to Exhibit A as the Application in this matter?

MR. KELLAHIN: Of Exhibit 18, which is the notice affidavit.

EXAMINER STOGNER: Oh, I'm sorry. Okay.

MR. KELLAHIN: If we turn to Exhibit A of 18, Mr. Robertson sent notice to 179 individuals and companies. He has identified the area of the existing pool, and that's shaded in pink. Within that area he notified all operators, and if there was a spacing unit without a producing well, he found the working interest owners and/or the unleased mineral owners and notified all those people.

In addition, you'll find a one-mile area around the pool. Under the one-mile rule, we're required under 1207 to notify any operators. There aren't any.

When you look down to the Crockett and the Buchanan well, Mr. Robertson provided more notice than the rule requires.

Within a mile of each of those wells, then, he notified all the working interest owners and the unleased mineral owners within a mile.

In doing so, Marathon has double-checked, and

they have overlooked some interest owners which were not given notice, and they are shown on my Exhibit 19. Within a portion of Section 3 to the south of the Buchanan well and in a portion of Section 4, the diagonal hached area was overlooked for notice purposes.

Under the Rules, we're not required to send those people notice anyway. We're required to send notice to any party that is a working interest owner or an unleased mineral owner within the acreage to be extended into the pool, and all those parties were notified. Those are the areas within the blue rectangles and triangles.

In addition, he's notified all interest owners within a mile of the two wells, with the exception of the acreage I've just described. I think that is more than is required by the rule, and with your permission, then, we will not send notice to the remaining 24 people in Sections 3 and 4 that were overlooked. If you desire us to do so, then we will.

EXAMINER STOGNER: I concur, Mr. Kellahin. I don't think it will be necessary.

MR. KELLAHIN: As a result of that notification of some 179 individuals, we are not aware of any objection, nor has any objection been filed with me.

That concludes our presentation.

And with your permission, we would ask that you

introduce into the record Exhibits 17, 18 and 19.

EXAMINER STOGNER: Exhibits 17, 18 and 19 will be admitted into evidence at this time.

I apologize for getting a little ahead in asking your previous witness about Exhibit Number 17.

Again, Mr. Kellahin, if you'll provide me a rough-draft --

MR. KELLAHIN: Yes, sir.

EXAMINER STOGNER: -- order in this matter. I'm assuming that will be Order Number R-5643.

MR. KELLAHIN: -- B, yes, sir.

EXAMINER STOGNER: With that, this matter will be taken under advisement.

(Thereupon, these proceedings were concluded at 10:48 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11964, heard by me on 16 April 1998.

, Examiner
Oil Conservation Division

STEVEN T. BRENNER, CCR
(505) 989-9317

CERTIFICATE OF REPORTER

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 April 25th, 1998.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998