STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

APPLICATION OF MCKAY OIL CORPORATION FOR COMPULSORY POOLING, EDDY COUNTY, NEW MEXICO.	)	CASE NO. 10386
APPLICATION OF YATES PETROLEUM CORPORATION FOR COMPULSORY POOLING, EDDY COUNTY, NEW MEXICO.	)	CASE NO. 10363

REPORTER'S TRANSCRIPT OF PROCEEDINGS
EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner
September 19, 1991
1:37 p.m.
Santa Fe, New Mexico

This matter came for hearing before the Oil Conservation Division on September 19, 1991, at 1:37 p.m. at the State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Linda Bumkens, CCR, Certified Court Reporter No. 3008, in and for the County of Bernalillo, State of New Mexico.

FOR: OIL CONSERVATION DIVISION

BY: LINDA BUMKENS CCR
Certified Court Reporter
CCR NO. 3008

I N D E X

September 19, 1991
Examiner Hearing
CASE NO. 10386 & 10363

E X H I B I T S

YATES PETROLEUM CORPORATION

MCKAY OIL CORPORATION

A P P E A R A N C E S

FOR THE DIVISION:
ROBERT G. STOVALL, ESQ.
General counsel
Oil Conservation Commission
310 Old Santa Fe Trail
Santa Fe, New Mexico
87501

FOR YATES PETROLEUM CORPORATION:
CAMPBELL, CARR, BERG & SHERIDAN P.A.
BY: MR. WILLIAM F. CARR, ESQ.
110 North Guadalupe
Santa Fe, New Mexico
87501

FOR MCKAY OIL CORPORATION:
KELLAHIN, KELLAHIN & AUBREY
BY: MR. W. THOMAS KELLAHIN, ESQ
117 North Guadalupe
Santa Fe, New Mexico
87501

EXAMINER CATANACH: At this time we'll call Case 10386.

MR. STOVALL: Application of McKay Oil Corporation for compulsory pooling, Eddy County, New Mexico.

EXAMINER CATANACH: Are there appearances in this case?

MR. KELLAHIN: May it please the Examiner I'm Tom Kellahin of the Santa Fe law firm Kellahin, Kellahin & Aubrey appearing on behalf of the applicants, and I have three witnesses to be sworn.

MR. CARR: May it please the Examiner, my name is William F. Carr with the law firm Campbell, Carr, Berge & Sheridan of Santa Fe. I'm appearing in opposition to the application of McKay in this case.

I also have an application that's docketed for hearing today. It is Case Number 10363 which is the application of Yates Petroleum Corporation for compulsory pooling. Some of the same lands are involved in each of the pooling cases accordingly.

We would request that that case also be called and they be consolidated for hearing at this time.

MR. KELLAHIN: We join in that request,

Mr. Examiner.

EXAMINER CATANACH: We'll just go ahead and do that then. We'll call Case 10363.

MR. STOVALL: Application of Yates Petroleum Corporation for compulsory pooling, Eddy County, New Mexico.

EXAMINER CATANACH: Are there any other appearances in any either of these cases?

(No response)

EXAMINER CATANACH: Mr. Carr, how many witnesses do you have?

MR. CARR: I have three.

MR. CATANACH: Can I get all the witnesses to stand up and be sworn at this time?

(At which time Mecca Morrison, Roy Beck, Pinson McWhorter, George Reddy, Charles Sanders and Roy McKay were sworn.)

MR. CARR: I think I should go first. The reason is I filed the initial application. We haven't discussed that, but --

MR. KELLAHIN: I have no objection to Mr. Carr presenting his technical case first. I'm prepared to make a short statement, of course. If that's appropriate you may go ahead.

MR. KELLAHIN: We're going to ask you,

Mr. Examiner, to resolve a dispute between Yates and McKay that the parties have been unable to resolve for themselves. The case has come before you in the format of competing compulsory pooling cases, but they are much more than that.

We're asking you to determine the optimum least risky well location. In addition, we're asking you to determine the appropriate orientation of the spacing unit. Virtually every other issue involved in compulsory pooling cases, I think, is substantially uncontested. There is no question that both operators are competent to be operators.

My understanding is that there is no material difference with regard to the estimated cost for drilling either one of these wells. It's my understanding that the overhead charges are not a subject of serious dispute, but what is is where you put the well.

We're dealing in the South Dagger Draw Associated Oil and Gas Pool. It's got its own special rules that are grafted into the Associated Oil and Gas Pool Rules. We're looking at a particular section, Section 25. The development of the South Dagger Draw has been substantially accomplished in this pool by Yates Petroleum, and as

that development takes place it's moving southward toward Section 25.

Section 25 is composed so that the southwest quarter of the section, plus the 40-acre tract being the southeast of the northwest are controlled by Yates, and the balance of this section is controlled by McKay.

Yates has been successful in the last few weeks in completing a very nice Dakota Dagger Draw oil well that reports indicate produces in excess of 450 barrels of oil a day. That well is located in the southeast of the southeast of Section 23 which is the direct diagonal offset to the well location that Mr. McKay proposes for this well.

As the development has occurred, this summer Yates proposed to McKay that a west half spacing unit be formed and proposed. However, instead of drilling the well in the northwest of the northwest that this will be located in the southwest of the southwest. We cannot resolve that among ourselves.

It is our belief, and our belief the proof will demonstrate to you, that the development location of least risk is the McKay location. That is one of the things you're going to be asked to

resolve.

In addition, it's important to us to lay the units down. We think an appropriate solution in this reservoir is to have the north half and south half proration unit. Yates has proposed a west half. We think that's wrong. The technical case will be presented to you on behalf of Mr. McKay by George Reddy. Mr. Reddy is an experienced geologist who's been retained by Mr. McKay to make a thorough and complete study of the geology and to come up with his own independent recommendation as to where to place the well within this section, which is now free of being dedicated to any well in the pool.

So we have the choice and the flexibility not only of the well location, but of the orientation, and it will be Mr. Reddy's independent geologic conclusion and recommendation that we locate the well in the northwest of the northwest.

In addition, we'll present to you a petroleum engineer, Mr. Charles Sanders. Mr. Sanders has done his own independent study. It is his conclusion, and my clients belief, that unless a well is drilled immediately in the northwest of the northwest, this acreage and Mr. McKay's interest is going to be drained by the

Yates operated well to the north and to the west, and so there's a drainage component to this case.

It is our belief and conclusion, and we hope the evidence demonstrates to you that at the end of the presentation you will agree with us, and that you will grant our compulsory pooling order dedicating the north half to our well at our location and allow us to go forward with the development of what we think are oil and gas reserves in this section that ought to be developed.

We are opposed to Yates and their location, their orientation. We've expressed that to them repeatedly, and the parties cannot solve it for themselves, so you must do it for us. And that is our case.

EXAMINER CATANACH: Mr. Carr, would you like to --

MR. CARR: I'm going to waive opening. I'm ready to call my first witness, Mecca Morrison, an expert witness in petroleum land matters.

EXAMINER CATANACH: Okay.

MR. CARR: And I have to pick up the exhibits which are in the next room.

MECCA MORRISON,

the Witness herein, being duly sworn, was examined

and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Will you state your name and place of residence?

A. My name is Mecca Morrison and I reside in Artesia, New Mexico.

Q. By whom are you employed and in what capacity?

A. I'm employed with Yates Petroleum Corporation as an associate landman.

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

A. No, I have not.

Q. Could you briefly summarize your educational background, and then review your work experience?

A. I have a bachelor of business administration degree from West Texas State University, and in the last eight-and-a-half years I've worked for Yates Petroleum Corporation Land Department. The last four years I've been doing technical and landman work.

Q. Are you familiar with the application filed in this case on behalf of Yates Petroleum

Corporation?

A. Yes, I am.

Q. And are you familiar with the application filed also by McKay?

A. Yes, I am.

Q. Are you familiar with the area and the acreage that is involved in each of these applications?

A. Yes, I am.

MR. CARR: We tender Miss Morrison as an expert witness in petroleum land matters.

EXAMINER CATANACH: She is so qualified.

Q. (By Mr. Carr) Would you briefly state what Yates seeks with this application?

A. Yates Petroleum is seeking to compulsory pool all the mineral interest in the west half of Section 25, 20 South, 24 East, and we're also here in opposition to McKay Oil Corporation force pooling Case Number 10386.

Q. Have you prepared certain exhibits for presentation in this case?

A. Yes, I have.

Q. And would you refer to what has been marked for identification as Yates Exhibit Number 1?

A. Exhibit Number 1 is a land map that shows

our proposed location in the southwest southwest of Section 25 and also shows our spacing unit as being the west half of Section 25.

Q. And what does the yellow shading indicate?

A. The yellow shading is acreage that Yates Petroleum either has an interest or is an operator of.

Q. Okay. What is the primary objective in the proposed well?

A. To test the Canyon formation at approximately 8100 feet.

Q. And could you identify what has been marked as Yates Exhibits Number 2?

A. Exhibit Number 2 is the operating agreement we've prepared under which to drill this well. It's our standard form that we use to operate most of our wells under, and it's on APL form of 1977.

Q. And this is the operating agreement that has been joined in by all the Yates entities that are involved in the tract?

A. Yes, sir.

Q. That has not been accepted or agreed to by McKay?

A. No, it has not.

Q. Okay. And what percentage of the acreage

under the west half unit -- proposed unit -- has been voluntarily committed to the well?

A. We have 61.25 percent committed.

Q. And is this a regular or an irregular section?

A. It's a regular section.

Q. Could you identify what has been marked as Yates Petroleum Corporation Exhibit Number 3?

A. Exhibit Number 3 is our AFE that we've prepared to drill and equip our proposed well.

Q. And on this exhibit, could you just review the cost for a dry hole and also for a completed well if successful?

A. Okay. A dry hole will cost approximately $240,000. A completed well will be approximately $504,000.

Q. Are these costs in line with what's charged for wells to this depth in this area?

A. Yes, it is.

Q. Now, Miss Morrison, would you refer to Yates Exhibit 4 and 5 together.

A. Okay.

Q. And with these exhibits just briefly summarize the efforts made by Yates Petroleum Corporation to reach a voluntary agreement for the

development of the west half of Section 25?

A. Okay. July of 1990 we first contacted Mr. McKay regarding this area, and since then we have sent approximately 17 letters to all the other working interest owners and had approximately 22 phone conversations.

Q. At this point in time you have not been able to reach a voluntary agreement for the development of a west half unit?

A. No, we have not.

Q. Could you identify what has been marked as Yates Petroleum Corporation Exhibit Number 6?

A. Yes, sir. It's the application filed with the New Mexico Oil Conservation Division.

Q. Is this an affidavit showing that letters giving notice of the hearing were provided to all interest owners in the west half as required by OCD rules?

A. Yes, it is.

Q. Okay. Had you also identified what is marked as Exhibit Number 7?

A. Exhibit Number 7 is a letter from Mr. Christopher Echols who is an oil right royalty owner on Mr. McKay's tract that was sent to the State Land Office in our behalf agreeing to our

being operator and also an agreement with our proposed location.

Q. Does Yates Petroleum Corporation seek to be designated operator of the well that it is proposing in the west half of Section 25?

A. Yes, they do.

Q. Will Yates also be calling geological and engineering witnesses to testify as to the technical portions of this case?

A. Yes, we will.

Q. Were Exhibits 1 through 7 either prepared by you or compiled under your direction and supervision?

A. Yes, they were.

MR. CARR: At this time, Mr. Catanach, we move the admission of Yates Exhibits 1 through 7.

EXAMINER CATANACH: Exhibits 1 through 7 will be admitted as evidence.

(Yates Petroleum Corporation Exhibits 1 through 7 were admitted in evidence.)

MR. CARR: That concludes my direct examination of this witness.

EXAMINER CATANACH: Mr. Kellahin.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Miss Morrison, will you refer to Exhibit 1 which is the land plat with the yellow shading on it?

A. Yes, sir.

Q. When we look at Section 25, am I correct in my opening statement when I look at the southwest quarter of that section, is the working interest 100 percent Yates and the Yates entities?

A. Yes, sir.

Q. And then you pick up the additional 50-acre tract out of the northwest quarter which is the southeast of the northwest?

A. Yes, sir.

Q. And apart from that, the balance of the working interest in the section is controlled by McKay?

A. Yes, sir.

Q. Okay. If the proration unit is turned to a south half proration unit in that instance then, Yates entities would have a 50 percent working interest, would they not?

A. That would be correct.

Q. Okay. Your map shows adjoining interest to the west in Section 25. As a land person with experience in this area, can you tell us what the

percentage working interest the Yates entities had in Section 25 -- I'm sorry, 26?

A. In 26?

Q. Uh-huh.

A. We own 100 percent of that section.

Q. Okay. And as we go into the 23 to the north?

A. Yes, sir.

Q. What's the percentage in that section for the Yates?

A. It's also 100 percent Yates entities.

Q. Okay. I haven't had a chance to look at your documents on the correspondence and the tabulation, but show me the first -- or tell me the date of first written communication to Mr. McKay in which this particular well at this location with this west half orientation was submitted to him for his consideration?

A. You want the actual letter?

Q. Yes.

A. I believe we talked about it first, but the actual letter?

Q. Uh-huh.

A. That would be on July 8, 1991, is when we sent the actual proposal.

Q. Had discussions prior to that centered around potential farm outs of his acreage to join Yates in developing this section?

A. We had discussed that, yes, sir.

Q. When we get down to the specifics of this particular well that's now the subject of Mr. Catanach's decision, the first written communication is the July 8th letter?

A. Yes, sir.

Q. Okay. At that time, were you aware of Mr. McKay's desire to have the northwest of the northwest as the additional well -- as the initial well location for this well?

A. Yes, sir. On July 3rd of 1991, I talked to Mr. McKay on the phone and he did relay that, and that's also the first time we had a location picked and where our spacing was going to be.

Q. So during this period of time both companies are talking to each other about resolving their differences in terms of the well location?

A. Yes, sir.

Q. And that was never resolved?

A. No, sir, it was not.

Q. In addition to the well location there is a continuing difference of opinion on the orientation

of that spacing unit, isn't there?

A. Yes, there is.

Q. And until those are resolved then, the question of the operating agreement and reaching other terms really is premature?

A. Yes, sir.

Q. Subsequent to the Yates request then, I think this shows that Mr. Carr on the 12th of July filed the compulsory pooling application?

A. That's correct.

Q. Okay. And then subsequently I believe, in August, Mr. McKay made his well proposal formally to Yates with an AFE and also his compulsory pooling application?

A. That's correct.

Q. Okay. At this point in time, is it a fair characterization that it's impossible to reach an agreement unless the Examiner decides what to do about well locations and orientation of the spacing?

A. I believe that's correct.

MR. KELLAHIN: Nothing further. Thank you.

EXAMINATION

BY MR. CATANACH:

Q. Miss Morrison, in the west half of Section 25 besides the Yates and McKay, are there

any other working interest entities that you're dealing with here?

A. There are other Yates entities involved. There is also -- besides McKay Oil Corporation there's a Sanders Petroleum Corporation, and that would be all the entities involved.

Q. Have you consolidated all the interest with the exception of McKay?

A. We've consolidated all the Yates entities. McKay Oil and Sanders Petroleum have not been.

Q. Sanders has not been?

A. No, sir.

Q. Do you know why they have not been consolidated?

A. I think for the same reasons that McKay has not been.

Q. Do you know what percentage they own?

A. Jointly they own 38.5, or 38.75 percent.

Q. When were the Sanders interest -- when were they first contacted?

A. I did not learn of their interest until August 1st of '91 when I talked to Mr. Dan Sorenson who had been an interest owner, and he informed me that he had sold his interest to Sanders Petroleum a year before.

The assignment was not filed until July 22nd of this year, and so I went and checked records at that point and that's when I came across the assignment, and I notified them. I sent the same AFE to Sanders Petroleum on August 1st of '91, once I learned of their interest.

Q. And what was their response to your letter?

A. I had no response.

EXAMINER CATANACH: That's all I have.

MR. CARR: At this time we call Ray Beck.

RAY BECK,

the Witness herein, after being previously duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

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

A. Ray Beck.

Q. Mr. Beck, where do you reside?

A. Artesia, New Mexico.

Q. By whom are you employed and in what capacity?

A. Yates Petroleum Corporation. I'm chief geologist.

Q. Have you previously testified before this

Division?

A. Yes, I have.

Q. And during your prior testimony, have your credentials as an expert witness in petroleum geology been accepted and made a matter of record?

A. Yes, they have.

Q. Are you familiar with the applications filed in each of these cases?

A. Yes, I am.

Q. And have you made a geological study of the area that is involved in these cases?

A. Yes, sir, I have.

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

EXAMINER CATANACH: They are.

Q. (By Mr. Carr) Have you prepared certain exhibits for presentation here today?

A. Yes, sir, I have.

Q. Would you refer to what has been marked for identification as Yates Exhibit Number 8? Identify this and review it for the examiner.

A. Exhibit Number 8 is a map of a portion of the South Dagger Draw Upper Pennsylvania Associated Pool. The map exhibit is a combined Canyon or Upper Penn dolomite structure map and top of big water

structure map.

The solid contour show the structural configuration on the top of the Canyon dolomite reservoir in 100-foot contours, and the dotted contours show the structural configuration of the big water contact dipping to the northeast in 50-foot contours. I can show on the cross-section here, solid contours along the top of this dolomite mass.

Q. And that's indicated on your Exhibit 9 by the --

A. Solid contours.

Q. The line at the top of the structure that you've drawn?

A. The question?

Q. The question is, you've just moved now from Exhibit 8 to Exhibit Number 9, correct?

A. Right.

Q. And what you've indicated are the solid contours are the top line across the structure that you've indicated on this exhibit?

A. Yes. The solid contours on this big water surface here, so you can more or less understand the map. This bend in here, don't worry about that. That's just because the cross-section extended out

of the dip, and it really dips to the northeast.

The solid contours on the map exhibit, again, are limited to east and west by 0 dolomite pinch-out lines. Circle well spots are Canyon or deeper penetrations. Green color well spots are South Dagger oil wells. Red-colored spots are gas wells or sour gas wells. Uncircled gas well spots indicate sweet gas production from zones stratigraphically lower than the Canyon such as Strawn, Atoka or Morrow.

The standard proration unit of the west half of Section 25 is outlined in red, and Yates standard well location in the southwest of the southwest is shown. Also shown is the small hexagon in the northwest of the northwest of 25 indicating location stake, and that's by McKay Oil Corporation.

Q. All right. Now, Exhibit Number 9 is the cross-section?

A. Yes, sir. Exhibit Number 9 is the cross-section in the east to west cross-section depicting the depth dimension across the South Dagger Draw. The Frosty logs are hung on at 100 feet sea level. The vertical scale is two and a half inches equals 100 feet, and horizontal distance between the logs is proportional to mapped

distances.

Shown is the top of the Canyon limestone called the Upper Penn by some workers. Featured are the limits of the Dagger Draw Dolomite reservoir facies and the hydrodynamically southwest to northeast tilted big water surface.

Q. Now, Mr. Beck, I think at this time we should first focus on the opposing well locations that are before David Catanach for decision, and so if you could perhaps start by describing the general production in the field and then relate that to the alternative well locations that are being proposed?

A. All right. Daggar Draw field produces sweet oil, sour gas and brackish sulphur water and combine stratigraphic hydrodynamics and structural trap.

Lithologically the reservoir is dolomite with intercrystalline, vuggy and fractured porosity. No dolomite, no reservoir. From the stratigraphic standpoint the dolomite reservoir pinches-out updip and to tight ceiling limestone on minor shales and pinches out down dip at a tight limestone and basinal -- interbedded basinal field classics, and this can be seen by examining the well logs on the cross-sections.

The following addresses the hydrodynamic portion of this complex trap. There's no water-free production in this field. Oil wells produce sweet oil, sour gas and brackish sulphur water. Gas wells produce sour gas condensate, and brackish sulphur water.

However, there is a mappable hydrodynamically tilted surface below which the dolomite reservoir is virtually all water filled. This surface which is hydrodynamically tilted, is southwest to northeast is referred to as the "big water." The familiar situation of the horizontal plane of gas/oil and oil/water contact does not exist in this field.

The Indian Basin Upper Penn field two to three miles southwest of our Section 25 here is also an Upper Penn dolomite reservoir with a southwest to northeast hydrodynamically tilted gas/water contact.

Q. Are you ready now to move to your Exhibit Number 10?

A. Yes, sir.

Q. Would you identify that for Mr. Catanach?

A. I offer Exhibit Number 10, which is a copy of a short paper by Hugh Frenzel, the geologist, on the discovery well at the Indian Basin field to the

south, which attest to the hydrodynamically tilted gas/water contact in that nearby field, and certain pertinent words are highlighted for your convenience.

Q. Let's now go on, and if you can explain what it takes in this field to make a well focusing on the structure of the dolomite in the area?

A. Okay. Structure on the top of the dolomite reservoir is especially important on the eastern most side of the reservoir, which we are concerned with here. To make an oil well in this field, the top of the dolomite reservoir must come in structurally higher than the tilted big water surface. This surface must come in higher than this one in order to get any hydrocarbons out. The contact comes down here. You can get the dolomite reservoir which is strictly all water.

Q. Why don't you go through to Coquina RS Federal Number 1 and relate that to this general statement?

A. Okay. The Coquina RS Federal Number 1 well in Unit C of Section 25, which is also shown on the cross-section, is a dry hole which encounters the top of the dolomite reservoir at or slightly below the "big water" contact.

Coquina RS Federal Number 1 has 192 feet of dolomite. However, all the dolomite is below the big water surface and water wet is shown by a drill-stem test that was taken on the way down. The top 85 feet of the dolomite yielded a pipe recovery of 1,457 feet of sulphur water with no mention of gas to surface or any other show.

One can see the interval tested and 85 feet of dolomite tested on the log of the RS Federal on the cross-section exhibit.

Q. Could you now go to Exhibit Number 11 and identify that, please?

A. Exhibit Number 11, which is a copy of the drill stem test chart. I offer Exhibit Number 11, which is a copy of the drill stem test chart. No where on the chart is there any mention of any shows, either the surface action or the recovery.

Q. Would you go now to Exhibit Number 12?

A. In addition, I offer Exhibit 12, which is a copy of a portion of the chronological well history of the RS Federal Number 1 which covers the DST Number 1 entries. Here again, there is no mention of any gas to surface or any other shows.

Therefore, the Coquina Federal RS Number 1 borehole encountered the top of the dolomite

reservoir structurally below. The big water surface is water wet in the dolomite reservoir and is not a producer in the South Dagger Draw field. Please note the Coquina RS Federal is located one 40-acre location east of the location that's asked by McKay in the northwest of the northwest of Section 25.

Q. And this would be located in the central portion of the north half which McKay is proposing?

A. Yes, sir.

Q. And it would be located in the extreme northeastern portion of the west half unit which Yates is proposing?

A. That's true.

Q. Now, if we look at this structure map, it appears that it tends to drop off or end fairly abruptly east and, I guess, the west side. Could you relate that to the general development of this field?

A. It also should be pointed out how steeply the structure on top of the dolomite reservoir drops off on the east side of the reservoir, and how this steep loss of structure materially affects production.

Please observe the wells drilled on either side of the boundary between Section 14 and 13 to

the north of our area of interest here in Section 25. Note that the top of the dolomite in the Hill View Number 7 well in Unit M of Section 13 had dropped off 157 feet from the Hill View 8 and Unit P of Section 14 just one 40-acre location, or 1300 feet away.

I'm going to read some numbers here. I wouldn't worry about writing them down because they're going to be compiled on a later exhibit, so you don't kind of have to worry about taking notes.

The initial production on the High Hill View 8 well was 250 barrels of oil per day plus 570 MCF per day, plus 992 barrels of water per day. Whereas the initial production on the Low Hill View 7 well was 91 barrels of oil per day, 394 MCF per day and 2,083 barrels of water per day.

Recent production on the High Hill View 8 was 190 barrels of oil per day, plus 1,026 MCF a day, plus 1,635 barrels of water per day. Whereas the recent production on the Low Hill View Number 7 was 20 barrels of oil per day, 261 MCF per day and 1,028 barrels of water per day.

Along the same section line note the Yates in these are three in Unit E of Section 13 has dropped off structurally 167 feet from the John

Number 4 in Unit H of Section 14, again, just one 40-acre location away.

The John Number 4 initials 5 or 1500 barrels of oil per day plus 1800 MCF per day, plus 750 barrels of water per day and the Ceniza Number 3 initials for 71 barrels of water per day, 171 MCF per day and 1371 barrels of water per day.

Recent production for the John Number 4 was 756 barrels of oil per day plus 2,588 MCF of gas per day, plus 726 barrels of water per day, whereas recent production for the Ceniza 3 was 21 barrels of oil per day but 305 MCF per day, plus 1,158 barrels of water per day. This is a remarkable difference in production for such closely spaced wells.

Q. Let's go now to Yates Exhibit Number 13, and I'd ask you to identify and review that?

A. At this time I offer Exhibit 13 which shows the stated above production figures and other figures from pertinent wells. Figures to the left of the well spot show the initial production -- initial potential of the well, and figures below the well spot show recent September production.

Q. And, again, this just sets out the information contained in exhibits -- or that you've just testified to, and it shows the sharp disparity

or difference in production between closer spaced along the edge of the formation?

A. Yes, sir, that's correct.

Q. What basic conclusions can you reach about the significance of structure in this area?

A. The point of all this is that a significant loss of structure with closely spaced 100 foot contours occurs on the east side of the Dagger Draw South Field, and a very good well can be offset with a poor well in just one location to the east.

There's also closely to 100 foot contours in Section 25. The lesson that the wells in 13 and 14 teach is that the east side of the Dagger Draw pickings is on the east side of the Dagger Draw picking locations by just close odds. It may be economically dangerous.

Q. Now, Mr. Beck, one of the primary issues here is the location that Yates is proposing as compared to the location proposed by Mr. McKay.

Could you review these two locations and evaluate them for us?

A. Using this combination map, still Exhibit Number 8 here, one can calculate the gross potential thickness of the hydrocarbon bearing column for any location in the Dagger Draw dolomite reservoir.

Thus, for the Yates Staghorn AGJ Federal Number 1 location in the southwest of the southwest of Section 25, the top of the Canyon dolomite reservoir is minus 3908 feet. That's 3,908 feet. You subtract it from the top of the big water a minus 4,062 for a gross hydrocarbon bearing column of 154 feet.

Q. Now, this is the location proposed by Yates?

A. Yes, sir, it is.

Q. Okay.

A. And I could show that on the cross-section. When you measure it off on the cross-section it's 154 feet. I'll be talking about this one basically. So the Yates location has 154 of hydrocarbon bearing column. It is very probable that a large portion of this gross interval will have enough dolomite porosity and permeability to result in an economically successful oil and gas well.

For the McKay location in the northwest of the northwest of Section 25, the top of the dolomite is minus 4047 subtracted from the top of the big water. A minus 4127 gives a gross potential hydrocarbon column of 80 feet or only 52 percent of the gross potential hydrocarbon column in the Yates

proposed location.

If enough of the predicted 80 feet of the gross potential hydrocarbon column is taken up by nonporous and permeable rock, it will, if drilled at the McKay location, be uneconomic.

Please note that for each 40 acre location I have calculated the gross potential hydrocarbon column with the resulting number posted to the right of the well spot.

Q. And this is on Exhibit?

A. Same Exhibit 8.

Q. Exhibit 8. All right.

A. For instance, the northwest of the southwest immediately, or Staghorn location, is 143 feet, and the southwest of the northwest, north again, is 122 feet, and the southeast of the southwest is 78 feet, and the northeast of the southwest is only 25 feet of gross potential hydrocarbon column. All the other 40 acre locations in Section 25 at zero feet of gross potential hydrocarbon column. Thus, for the Dagger Draw Reservoir the map indicates that the west half of Section 25, the proration unit proposed by Yates, is 75 percent potentially productive.

The east half of the Section 25, on the

other hand, has zero potential for production. The map also indicates the north half of Section 25 is 25 percent potentially productive, and the south half is 50 percent potentially productive.

Strongly corroborating the map interpretation are the two wells already drilled in Section 25. The Coquina R.S. Federal Number 1 in Unit C, which has already been discussed with exhibits, has no Dagger Draw potential by virtue of water-wet DST taken on the upper 85 feet of the dolomite reservoir. Also already drilled in section 25 is the McKay (formerly drilled by Sun Oil Company) Charolette McKay Federal Number well in Unit H, which encountered no Canyon or Upper Penn Dagger Draw dolomite at all.

One may observe that the Charolette McKay Federal Number 1 has no dolomite reservoir by examining the Compensated Neutron-Formation Density log of the well on the cross-section exhibit already admitted. So, two drilled wells in the north half have already proven to be nonproductive as far as the Dagger Draw dolomite reservoir is concerned. One well is wet, and the other had no Dagger Draw Canyon dolomite reservoir at all.

Q. Well, what conclusion can you reach about

the two locations that are being proposed here today?

A. Therefore, the standard proration unit proposed by Yates consisting of the west half of Section 25 most efficiently surrounds the potentially productive portion of Section 25.

Geologically, the Yates Staghorn AGJ Federal Number 1 location in the southwest of the southwest of Section 25 is the best allowable location in the west half of the proration unit and indeed, the best allowable location in all of Section 25 for drilling a well which would produce economic volumes of oil and gas in the Dagger Draw Canyon dolomite reservoir.

Q. Now, Mr. Beck, I believe you've also prepared testimony concerning the geological risk associated with the development of these properties?

A. Yes, sir.

Q. Could you briefly summarize what risk is associated with the development of this type of a reservoir?

A. The Daggar Reservoir is a carbonate reservoir, and like all carbonate reservoirs it's complex in geometry and variable in reservoir quality from place to place. That is, there is

always geological risk in drilling for and developing carbonate reservoir.

An example of how the Dagger Draw dolomite reservoir can abruptly thin to zero dolomite reservoir in a short distance may be seen on the map in Section 34 of 20024, Exhibit 8 there on the main map.

Conoco drilled their Preston Federal Number 2 well at a 40-acre location north of an older Standard of Texas Federal Number 1 well. The Old Standard Texas well had encountered 351 feet of Daggar Draw dolomite reservoir whereas the new Conoco well encountered zero dolomite reservoir.

As may be noted on the map, there is a large Eastward pinch-in of the dolomite reservoir. On the Eastern side of the reservoir, which we are concerned with here, the reservoir not only thins going East, but carbonates begin to interfinger with nonreservoir basinal clastics, principally shales, light sandstones and silt stones.

This relationship must be seen on cross-section between the Yates Conoco AGK Number 2 and Coquina RS Federal Number 1, this well here and this well right here. You see on this one here and this one here, the productive Yates Conoco AGK

Number 2 has only 44 feet of nonreservoir limestone cap, whereas the dry hole Coquina well, to the right over there, has 185 feet of limestone cap plus a wedge of 900 feet of basinal clastics above the dolomite reservoir.

These East side facies changes resulted in the dolomite reservoir being at or below the big water surface at the Coquina location, and further resulted in the nonproductive water well in the Dagger Draw dolomite reservoir.

As previously mentioned, the Standard Texas Smith Federal Number 1 well in Section 34, which has 351 feet of Dagger Draw dolomite reservoir, should have made a productive oil and gas well according to logs and drill stem tests.

However, the original attempt was evidently disappointing to the operator and the well was sidetracked a short distance. The sidetracked hole apparently had no better log or DSTs in the operators evaluation, therefore, no second completion was attempted and the well was plugged.

This well is an example of the risk in completing carbonate reservoirs. The Yates engineer witness will testify in more detail about the high drilling, the equipping, infrastructure and lease

operations costs in this field.

Q. Okay. Can you summarize your conclusions that you've reached about the risks associated with this well?

A. To summarize about risk, the map, the cross-section, and experience of drilling in the Dagger Draw Field show that there is geological risk in drilling and especially near the edges of this complex carbonate reservoir.

Q. And what risk penalty do you recommend be assessed against any interest owner who does not participate in developing the west half with the well you have proposed?

A. I recommend a risk penalty of 200 percent.

Q. Mr. Beck, were Yates' Exhibits 8 through 13 prepared by you or compiled under your direction?

A. Yes, they were.

MR. CARR: At this time, Mr. Catanach, we would move the admission of Yates' Exhibits 8 through 13.

EXAMINER CATANACH: Exhibits 8 through 13 will be admitted as evidence.

(Yates Petroleum Corporation Exhibits 8 through 13 were admitted as evidence.)

MR. CARR: And that concludes my examination

of Mr. Beck.

EXAMINER CATANACH: Mr. Kellahin.

CROSS-EXAMINATIN

BY MR. KELLAHIN:

Q. Mr. Beck, have you only prepared one cross-section line through this vicinity?

A. Yes, sir.

Q. And that's what you're looking at on Exhibit 9?

A. Yes, sir.

Q. When we look structurally at the relationship between the Yates location and the McKay location, the big water top looks to be higher structurally in the Yates location?

A. You shouldn't be misled by that big water top there. This cross-section was meant just to show, first of all, you know, the top of the Canyon line there and how it is just recently dipping from west to east, and where the dolomite is on the log, and how we picked the top of the -- for the solid contours on the top of the dolomite, and how we picked the dotty contours on the big water surface.

The reason -- if you look at the cross-section trace on the map, you can see that the -- if I'm going through the third well to the

next -- to the Staghorn there, we're going southeast which is recently updip against that big water, so it caused that bulge in it. It really doesn't have anything to do with the configuration of the structure on that big water. You have to look at the map to see that.

Q. When I look at Exhibit 8, the structure map?

A. Yes, sir.

Q. It's mapped on top of what feature?

A. Okay. The solid contours are mapped on top of the dolomite.

Q. And on your cross-section that's the line that you've identified by the words Canyon Limestone Upper Penn?

A. No, sir. No, sir.

Q. Okay.

A. It's mapped on this feature here.

Q. You're identifying for the record the line that is shaded -- the top portion of the line that's shaded in the what? Lime color?

A. Well, it's lime-colored on the left, and it goes into blue on the right, but it doesn't extend beyond where you have no dolomite. See, we're just mapping on top of the dolomite. We're not mapping

on the structure of the Upper Pennsylvania so that's the reason it dips to the west to east. It really doesn't have much to do with the production.

Q. Have you attempted to construct a structure map on the base of the dolomite?

A. No, sir. It didn't seem to be meaningful. However, we do know how thick the dolomite is.

Q. On Exhibit Number 8, I can understand the structural contour lines, but I'm not certain I can find how you have mapped and contoured the gross thickness of the dolomite. Is that displayed on Exhibit 8?

A. No, sir, it's not.

Q. Did you prepare what I would call a gross isopach to demonstrate the distribution of this gross dolomite thickness?

A. No, sir. We have one at the office, but here, again, it turns out that this doesn't turn out to be too meaningful because just like in the Coquina R.S. Federal well, you can count up 192 feet of dolomite in the thing, but, you know, by the drill stem test, which it shows to be water wet, so it doesn't mean anything to have 192 feet.

You might have a well in there that's 100 feet, or half of that much, and it can still make a

well, but if it's got hydrocarbon bearing column above that big water.

Q. I can have half of the 190 feet and make a well?

A. Right.

Q. As long as I'm above the big water?

A. Yes, sir.

Q. Well, that's what I have at McKay's location, don't I? I've got 80 feet?

A. You have 80 feet? You've got 80 feet, but as we pointed out, we have 154. According to my interpretation, twice as much.

Q. When you look at the southwest quarter it's going to be a gas well, isn't it?

A. No, sir.

Q. What tells you it's not going to be a gas well?

A. Well, the closest wells are in Section 26 there, and the well in -- the two colored green wells in Section 26? The well to the west there has a GOR of 1,961 and 42 gravity oil, and the other well has a GOR of 2640 and 47 gravity, and they're called oil wells there, but that was the initial completion.

Now, these red dots over to the west here

are gas wells, and those wells produce a condensate that's got a gravity of 55 to 63, considerably higher.

Q. When we look in 26?

A. Yes, sir.

Q. The rest of those symbols in there are proposed locations?

A. Yes, sir. Undrilled, but proposed locations.

Q. In order to give a sense of your analysis of the gross dolomite thickness, I can look at Section 25 on Exhibit Number 8 and you have put some of these gross thickness values on a 40-acre basis within that section?

A. Well, here again, I think we're not using the same terminology.

Q. Okay.

A. What I've done with these numbers in Section 25 there is the amount of dolomite above the big water only, see. So that's what we're showing there and not gross thickness of the dolomite. That's the important thing.

Q. How do you map and determine the top of the big water?

A. We've done that through perforations --

perforation history -- drilled stem test data, and also we don't have that, we use mud logs where the gas -- when they're drilling through the pay section you'll start carrying gas in the dolomite if it's above the big water, and then you'll carry it down and it will start diminishing right near around the big water top, and some of that information is on this cross-section.

For instance, this well here, three drill stem tests here, and all of them produced free oil with reservoir-type pressures right down to this point right here, and so that's what we've used as a point there.

Here they had two drill stem tests with free oil, but they even perforated lower, so you've got to take that -- at least as low as the bottom perforation there, and here they drilled into it -- Coquina drilled into it -- they stopped and ran a drill stem test, which I won't go into great detail on, and got only water.

So you've got to conclude that big water surface is at or above this. So I used a mental point there of minus 4135. By picking together this sort of information together on a map, you can map it.

Q. And that's what I'm getting to, Mr. Beck. I want to understand the methodology by which you have come to the conclusion about the location of big water, and as I understand it, you simply map the space of the perf on the well at the point where you find indications to you of big water?

A. Well, you can utilize a number of them where they perforated starting off at the bottom and they'll get water and then they'll move up the hole and perforate, and so you take the bottom perforation of which you start getting significant oil out of.

So some of these things they would do that way. They would start at the bottom and march up the hole until they got into oil production. So then all you can do is take the bottom perf there and that gives it really kind of a maximum number downward for the very big water, and that's the very best information.

The next best information is drill stem tests. On all the wells that they had drill stem tests in the dolomite section above the big water you get free oil on the test. Gas to surface, and wells that are in the virtually water filled part just get all water. So in piecing that information

together you come up with a map that's close. It's not as good as picking the top of the dolomite because you can do that precisely on the electric logs, but it can be mapped.

Q. When we're looking at the dolomite above the big water?

A. Yes, sir.

Q. Can that be divided into different zones or intervals within the dolomite?

A. It can be, and you can trace them for short distances, but as you go over the large part of the field you usually get bogged down and can't -- I can't seem to make much sense in subdividing it.

Q. So to understand your number then, when I look at 25 at the McKay location I'm looking at gross dolomite above the big water when I get 80 feet?

A. Yes, sir.

Q. When we look over at the Prickly Pear in the southeast of the southeast of 23?

A. Yes, sir.

Q. What was your gross dolomite above big water in that well?

A. 225 feet.

Q. Where is the Hill View Number 1 well? Is

that on your display?

A. I don't believe the Hill View Number 1 is on the display.

Q. It's up in the Section 12, isn't it?

A. It's up north, right.

Q. Okay. You talked with the Coquina drill stem test?

A. Yes, sir.

Q. And that was of significance to you?

A. Yes, sir.

Q. Because based only on the drill stem test -- I guess, the operator didn't attempt to complete or produce, he simply took the drill stem test and left it at that?

A. Yes, sir, that's right. He evidently got a drilling break there and tested it, but the results of it when he drilled the well on down to the Morrow, he didn't consider the well to be economic either in the Morrow where the well was plugged and abandoned without any attempt for completion of anything including the Canyon dolomite reservoir.

Q. Did you run a drill stem test on the Prickly Pear?

A. No, sir. We considered an inside location and didn't have to.

Q. Do you know the Hill View Number 1 well?

A. Yes, sir.

Q. There was a drill stem test on that well wasn't there?

A. Right.

Q. What did that well show on a drill stem test?

A. Drill stem test showed water in one of them.

Q. Yates went ahead and completed it despite the fact that it had a drill stem test that showed only water?

A. Well, we tested a lower section of it. The drill stem test was not at the top of it, so the -- and the very top of the thing. We just tested a lower section to see what we would get there. It was just for our own purposes. There was an upper part of it that wasn't tested in the reservoir if which we assume that most of the oil that well is coming out of, and it's another one, those east side wells, that's down significantly from the well immediately to the west, and it's not a very good well.

Q. When we look in 13 -- did you sponsor Exhibit 13? Did we get that far? That's the

production information on this?

A. Yes, sir.

Q. Up in the northeast of the northeast of 23, I don't have a well name for that one, is that the Hill View?

A. That's the Hill View Number 5.

Q. Okay.

A. You can tell by looking on Exhibit 8.

Q. Again, in order to try to understand the display, where's the big water contact in that general area of that well?

A. In that well there -- in that well there, is one that I don't have a big water top on because I considered it too hard to pick, and I had to -- I had to rely on nearby wells for that one. I did not try to pick that one. I didn't think I could pick a good number on that one. That happens on a few of these wells in here where the mud log wasn't conclusive or something and we didn't run a drill stem test, of course, and perforations didn't indicate a good number.

Q. How much dolomite do you have in that well? The gross dolomite in that well?

A. On the gross dolomite in the well in Unit A, we had 255 feet gross. That's everything

good and bad.

Q. When I followed the big water line just to the north of the Coquina well in 25, is that the dotted line at minus 4150?

A. Yes, sir.

Q. Everything below 4150 is big water?

A. Right. At that point you see the Coquina R.S. Federal well I figured at minus 4135, so that line is only 15 units, see, so you can -- there are 50 foot contours you can see it approximately right.

Q. Am I correct in understanding the display? As I look to the north of that line I'm going to be in big water?

A. It depends on where you run into the dolomite, yes, you would. You'd be at minus -- right there at the section line right above the R.S. Federal there. It looks like approximately like the big water is approximately 4150 and the structure in the dolomite is also 4150, so there it would be dry -- I mean, it would be wet.

Q. And as we move to the Prickly Pear location we're slightly up out of the big water because we're south and west of that dotted line?

A. That's right, but it means that you've got to -- in order to construct these numbers -- like

225 for that well -- you have to subtract, you know, the top of the dolomite, the bottom number there minus 3917 from a minus -- big water number -- minus 4142, and let's see if I have greater thickness of that.

Q. Perhaps you can tell me --

A. Excuse me, I found it. The well -- the Prickly Pear -- had a gross thickness of dolomite of 274 feet, and there was 225 feet of that before the big water, so there was some wet dolomite below in our opinion.

Q. Well, bear with me. As we follow the line of big water at minus 4150 and move up northward into Section 23, I get to the well in the northeast of the northeast. Exhibit 13 shows me that produces 620 barrels of oil, I guess, on a daily basis, and it appears to be below the big water?

A. No, sir. That's not what we're coming from. You have to take the number there for the well in Unit A of 23. You've got a top of the dolomite at minus 2930, okay?

Q. Uh-huh.

A. Now, the big water by well -- we didn't pick one in this particular well, but by using other wells around there you can see that thing comes in

about a minus 4155 or so. So you take minus 4155, you estimate it, and subtract 3937. 218 above the big water. See, you have to use it in conjunction with both of the contours. You can't just go by the big water.

Q. I'm trying to understand how you reach your display. Can't we simply solve this, Mr. Beck, by laying this spacing unit down and you get your well location, Mr. McKay gets his, and everybody is just happy?

A. Well, sir, we believe that our proration unit most efficiently fits the geology, and that our location in that proration unit is the best. If you're going to drill a well, you know -- and the rules in this field down here at 320-acre spacing and 1400 barrels of oil a day from the hole, so you can drill as many wells as you can and stay 660 within all boundaries, so you start with the best location and then work from there.

Q. And that has been the pattern with Yates in Section 23 is those wells are getting drilled up on 40-acre spacing, aren't they?

A. Yes, sir.

Q. And you get to produce that allowable under these rules provided you continue to be classified

as oil wells. You can produce it in any combination between the wells, can't you?

A. Well, if I understand what you're saying, you know, the 320 acres spacing, and you can drill as many wells as you want, you get up to 1400 barrels a day, and then if production drops off substantially, you can go up and drill it up until you get to drill up on forties in the oil leg here.

Q. But if you have a gas well in this pool, you can't simultaneously dedicate that acreage to your well?

A. We're not asking to drill any gas wells, and even, you know -- hypothetically you drill a gas well, and then we wouldn't be anywhere near the 1400 barrels, and you try to drill somewhere where you can get the oil out. That's a hypothetical.

MR. KELLAHIN: Pass the witness, Mr. Examiner.

MR. CARR: Nothing further.

EXAMINATION

BY MR. CATANACH:

Q. Mr. Beck, you've stated that in your opinion the west half is 75 percent productive. Is there a way to show me which 75 percent is productive in that west half?

A. Yes, sir. What I'm saying there is if you look in the west half, you start with the Staghorn location down in the southwest southwest, it's got 154 feet above the big water. The well immediately to the right has got 78. It's still enough to be counted.

The well to the north of the Staghorn is 143, and the well to the right of that gets down to only 25. We include it. Then, the well to the north -- well there in the northwest quarter -- the southwest of the northwest quarter. You see that? It's 122 and then you move up to the McKay location it's 80, include that.

What we don't include is the Coquina R.S. Federal Number 1 there, the dry hole that had the DST wet, and the location immediately south of it. So you've got six of eight possible locations which is 75 percent.

Q. So, approximately everything to the right of the 4100 foot contour line is probably nonproductive acreage?

A. Well, sir, here again, what you've got to do on all of these to get to talk about productive acreage, and that means above the big water you've got to subtract the structural top of the dolomite

number from the big water number.

For instance, you take the location there in the northwest quarter, the southeast of the northwest quarter, there's a zero there. The structure there you can see is a minus 40 -- it's just a little over minus 4100 -- minus 4105, and the big water you see coming across there is also that minus 4105. So I think there's just a coincidence you would have the top of the dolomite sitting on the big water and you drill a water there and you get zero, so I don't count it.

You have to always subtract the solid contour value from the dotted contour value. You can't just look at either one of those contours by themselves and follow what I'm trying to say here.

Q. Would you consider any dolomite above the big water one, two, three feet, would that be productive?

A. Probably not. It would probably take a little more than that.

Q. At what point would you reach where you think it would be productive?

A. Well, we will probably try it if it had 25 feet or more, but it probably wouldn't be a very good well, and like I said, on the east side of this

field here, if you watch what happens, you get these facies changes rapidly, and the top the dolomite drops down and some of the dolomite is taken up with classtic wedges, and so the total amount of dolomite is reduced and you get to the point where the well, even though it maybe had 80 feet, would not be economic.

We'd probably try it. We'd try it probably, but it might not be economic. So you try for the most of the dolomite you can to get above that big water, and then after you drill a well you see what happens, and if it works out, well then, you go right on with your program.

Q. Are your producing rates in this field, are they pretty much proportional to the amount of dolomite above of the big water?

A. That and other things like vagaries of permeability. Sometimes we drill wells where we loose circulation in the big water -- I mean, above the big water, in the good part -- and that's always good.

When you get up close to maybe 1,000 barrels a day or 800 barrels a day to begin with. On the other hand, if you get that lost -- circulation bits drops or something down in the big

water, you want to stay away from it because it will make enormous amounts of water and so much you cannot move enough fluid to get the oil out.

Q. Is there a gas cap on this reservoir?

A. The gas cap is -- see on the west side of the field where the red dots are on Exhibit 8, right between where the green and the red are, if you take that on down into, say, Section 35 there that would be approximately where the gas contact is. Of course, we tried to develop an oil leg because that's where the economics are, and we found out that these other -- drilled some of these other gas wells, some of them because of expiring leases, and in the early days we wanted to find out what was out there.

Q. Okay. At what depth would you consider the gas/water contact, do you know?

A. That's the thing. This reservoir is -- you've got this big wad of dolomite extending north of there, and the west side of the -- the high west side of it has got gas above big water, and in the middle part of it has got oil above big water, and the portion of the east side over there just got big water. It's a complex deal. It's not an ordinary thing. It's hydrodynamically tested all the way

from this big field two or three miles down to the south called Indian Basin which has the same sort of tilted north -- southwest to northeast tilt on it just as it does here.

EXAMINER CATANACH: I believe that's all I have.

DIRECT EXAMINATION

BY MR. STOVALL:

Q. I have just one question for Mr. Beck. You're recommending this location because you feel it's a higher probability of drilling a successful oil well; is that correct?

A. Yes, sir.

Q. Do you still feel it's a maximum risk location?

A. I believe that, you know, we're taking the risk, and that would be a reasonable number because you never really know until you get out there and drill it.

We believe that based on the geology here, the subsurface control, and in our experience, that's the best location, but on the other hand we think that anyone that wouldn't join should be penalized for it to that amount because we're dealing with a complex carbonate reservoir.

MR. STOVALL: That's all I have.

FURTHER EXAMINATION

BY MR. CATANACH:

Q. Mr. Beck, does Yates have any wells with gross dolomite thickness of approximately 80 feet?

A. Probably do somewhere up to the north. I don't know whether it's on -- well, let's see. Right. There's one well there -- one there in the southwest of the southwest of 13 that's got -- between minus 4120 and 4187 you've got 67 feet, and that's a poor well.

In fact, we talked about it in the -- on the -- you can see the production on that well on the Exhibit Number 13 where we compiled production figures, and it's now making 20 barrels oil a day, 1,028 barrels of water, and 261 MCF. The well just immediately to the west is making a 198 barrels of oil, 1,635 barrels of water, and 1,026 MCF.

EXAMINER CATANACH: That's all I have. The witness may be excused.

MR. CARR: All right. At this time we call

PINSON MCWHORTER

the Witness herein, being previously duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Will you state your name and place of residence?

A. My name is Pinson McWhorter. I live in Artesia, New Mexico.

Q. By whom are you employed, and in what capacity?

A. I'm employed by Yates Petroleum Corporation as a petroleum engineer.

Q. Have you previously testified before this division and had your credentials as a petroleum engineer accepted and made a matter of record?

A. Yes, I have.

Q. Are you familiar with the applications filed in each of these cases, one by Yates, one by McKay?

A. Yes, sir.

Q. Have you made an engineering study of the area that is the subject of these applications?

A. Yes, sir, I have.

Q. And are you familiar with this pool?

A. Yes, sir, I am.

Q. About what portion of your time do you actually devote to this particular pool?

A. I spent about 75 percent of my time working

this pool and the pool just north of that.

Q. And you were previously qualified as a petroleum engineer?

A. Yes, sir.

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

EXAMINER CATANACH: They are.

Q. (By Mr. Carr) Have you prepared certain exhibits for presentation here today?

A. Yes, I have.

Q. Would you refer to what has been marked as Yates Exhibit Number 15 and identify that for Mr. Catanach?

A. Yes. This exhibit depicts an estimate of oil recovery for oil well locations within the map confines here in the South Dagger Draw Pool Upper Penn Pool in Eddy County, New Mexico. What it shows in thousands of barrels -- the legend shows thousands of barrels and the numbers represent --.

For instance, in the northeast of the northeast of 14 there's a well that has a projected ultimate oil recovery at 310,000 barrels. As we go to the south we see that there are wells in Section 13 that have substantially lower recoveries than wells directly offsetting to the west.

For instance, wells producing oil here will be projected to have 18,000 barrels of oil as compared to 405,000 barrels of oil directly to the west. As we proceed to the south we see that I have estimated the reserve recovery -- oil reserve recovery -- for a Staghorn location at a 165,000 barrels.

Q. What general conclusions can you reach about the recovery along the eastern down dip flank of this reservoir?

A. Well, this -- the recovery -- the daily production and the declines on the wells along the east versus the further west up dip structural section, as shown by Mr. Beck's cross-section and more vividly, by his structure map, that's been a point of discussion here for some time now. It shows as we get on those wells that are very low dipwise to the east, they have very poor recoveries. That very poor recovery, of course, is related to -- directly related to the amount of reservoir quality dolomite -- hydrocarbon bearing dolomite -- in any given well.

The best example of the two wells in Section 13, the one to the north, the 18,000 barrel recovery well is the Ceniza Number 3. The one to

the south, the Hill View Number 7, is projected to have 25,000 barrels of oil recovery. Due west of that is a well -- the Hill View 8 -- which we projected to have 295,000 barrels of oil recovery, but has significantly more dolomite which is hydrocarbon bearing.

Q. So, Mr. McWhorter, if I understand what you've done here, the reserve numbers that you have obtained, the 165 NBO for the Staghorn location, you've got that by projecting the net thickness and then comparing it to water wells with comparable thickness in the area?

A. That's correct.

Q. Does Yates Petroleum Corporation seek to be designated operator of this well?

A. Yes, we do.

Q. And what experience has Yates had with the development of the Upper Pennsylvania in this area?

A. Well, Yates Petroleum Corporation has drilled and operated eighty wells in the Upper Pennsylvanian in this area. We operate -- have drilled and operated 33 wells in the north pool and 47 wells in the south pool. Currently we have three rigs running in this field, drilling three more locations at this time.

Our current oil production is in excess of 13,000 barrels of oil per day. We have production of gas in excess of 50 million cubic feet of sour production per day, and we have excessive water production, which is commensurate with the Upper Pennsylvanian here and the hydrodynamic nature of the trap, and we produce right now and dispose of some 45,000 barrels of water per day.

Q. Do you happen to know how many wells are operated by McKay in this field?

A. In this pool there are none operated by McKay.

Q. Let's look at Exhibit Number 16. And I'd ask you to identify that for the Examiner?

A. Okay, sir. Exhibit 16 depicts the gas and water gathering system that was put in place by Yates Petroleum Corporation and is still a dynamic entity. It's still an ongoing thing. We're still laying more water and gas gathering systems, buying more compression.

The necessity of this extensive water gathering system is depicted in the blue lines, and the blue dots are disposal wells that we have in the system, and the red lines depict the main arteries of the gas gathering system, but what necessitates

this is the nature of the gas production, which is sour gas, in the extensive water production in the field which averages at least 600 barrels of water per day per well, and for many wells even higher than that, and so this field, as far as the recognition of the hydrocarbon bearing pay zone, has been known for quite some time.

However, prior to mid-1980 operators never invested the money necessary to develop the water disposal system that would be commensurate with the excessive amount of water production and the ability to move the sour gas to sweetening plants to be sweetened, and the petroleum was instrumental in the development of an extensive system to do that as an operator.

Q. Does Exhibit 16 show just basically the trunk lines in this system; is that what it's designed to show?

A. That's correct. These are the main arteries of the system. They do not depict the extensive lines of just flow lines from the well heads into the main arteries.

Q. Will you refer to Yates Exhibit Number 17? Identify that and review it, please?

A. Yes, sir. This exhibit highlights some of

the statistics concerning the gas gathering and water gathering system that we have installed. As I said, we're delivering right now in excess of 50 million a day in our gas gathering system. By mid November with the advent of another compressor that we'll bring on line, we'll have capacity for 57 million a day. By the end of December with addition of more compression that we have ordered, we will be up to 67 million a day capacity.

Currently we have 52 miles of gas gathering main artery gathering systems, and we're now looking at the design of a 10-inch loop down in the southern part of the field. That would be 11 miles of 10-inch loop down there, which would be an additional amount of gathering in the field.

Currently we have on line 10,000 horsepower of compression. We have another 2500 horsepower of compression on order.

The other part of the exhibit indicates data -- statistics -- concerning the water disposal system. We dispose -- as I said -- 45,000 barrels of water a day is our current disposal, and we actually have capacity to dispose of 50,000 barrels of water a day.

We have eight active salt water disposal

wells distributed throughout the field. We have two salt water disposal wells that are currently being converted, and those will be on line shortly. At that time I project that we will have in the neighborhood of 60,000 barrels of water disposal capacity.

Q. Now, is there any water-free production in this area?

A. No. There's no water-free production in the Canyon in this area.

Q. Could you make an estimate as to what might be the average water production per day?

A. Yes, sir. As I said, it averages around 600 barrels a day per well -- average water production per well.

Q. And does Yates have excess capacity and would be able to handle any water that would be produced in conjunction with hydrocarbons in its proposed Staghorn allowable?

A. Yes, we do.

Q. The gas that would be produced with the oil, would that be, in your anticipation, sour or sweet gas?

A. No, this would be sour gas.

Q. And what would you propose to do with sour

gas produced from the Staghorn?

A. Well, we would -- as we are testing the well as we initially complete it, and again, the test phase, we'll hook it right up into our sales line and begin gas sales. The gas goes to basically one of three outlets. It will either go to a TransWestern sweetening plant, or it would go to a northern sweetening plant in Hobbs, or could potentially go to a Phillips sweetening plant. We do send some of our gas over to Phillips' sweetening plant.

Q. But you would have the ability to sweeten the gas, whatever it would produce?

A. That is correct.

Q. When you are testing the well, what would you do with the gas during testing? Would you flare it, or would you be able to put it into the line?

A. No, sir. We would put it right into the sales line.

Q. Based on the facilities that Yates has in place in the area, is it well equipped to handle all the production that it would be able to obtain from the proposed well?

A. Yes, sir.

Q. Were Exhibits 15 through 17 prepared by

you?

A. Yes, they were.

MR. CARR: At this time I would move the admission of Yates 15 through 17.

MR. CATANACH: Exhibits 15 through 17 will be admitted as evidence.

(Yates Petroleum Corporation Exhibits 1 through 17 were admitted in evidence.)

MR. CARR: That concludes my direct examination of this witness.

MR. CATANACH: Mr. Kellahin.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Mr. McWhorter, on Exhibit 15 when we look at the Marathon well in 36?

A. Yes, sir.

Q. Which is southeast of your proposed location?

A. Yes, sir.

Q. That's a sour gas well that's currently shut in, isn't it?

A. Yes, sir, it is.

Q. That well's not being produced, is it?

A. No, it's not.

Q. Is it completed in this dolomite that

Mr. Beck was describing for us?

A. They have -- let me say this, they have perforated throughout the dolomite. There seems to be some question as to what they're actually finally producing from is in the dolomite or not, but if it is it's at the very, very top of the dolomite section itself.

Q. Is it the information from that Marathon well that causes you to believe that your location is going to produce sour gas?

A. The information that causes me to think that we're going to produce the sour gas is that we've drilled 80 wells in this dolomite out here, sir, and it's produced sour gas each and every time.

Q. I guess I'm confused. Mr. Beck was talking about as you move north you produce sweet gas. Did I misunderstand?

A. Not within the dolomite section I don't think you produce sweet gas. Where you produce sweet gas is when you move up the hole and into the limestone section. Very frequently if you perforate the limestone section you will produce sweet gas with them.

Q. I guess I don't understand the point of your discussion about the water disposal facilities

utilized by Yates in this field. Is not that water disposal facility a separate entity within the Yates structure of companies?

A. Yes, it is.

Q. And don't those companies in which Yates has a working interest in these particular wells on a well-by-well basis pay a fee to the disposal company?

A. Yes, sir, they do. As you well know a fee would be charged by any company to dispose of water. The fee to dispose of that is less than a third of what it would cost to truck the water --

Q. I understand.

A. -- which is the other option.

Q. And regardless of who operates or how you configure the proration unit for Section 25, Yates is going to have a working interest in the well?

A. Yes.

Q. And with that working interest then, that well's production is eligible to have the water produced going into the Yates system for a fee?

A. That could probably be worked out. It would be an item that probably could be worked out.

Q. When we look at Section 26 there's some well spots in here for which you've not calculated

cumulative oil production?

A. Estimated ultimate oil production?

Q. The estimated ultimate oil recovery?

A. Yes, sir, that is correct.

Q. Why not?

A. Well, what I did was, I calculated the ones that -- for the ones that Mr. Beck has on his daily production map that he showed earlier.

Q. You haven't calculated the estimated ultimate oil recovery for either of the wells in 26?

A. No, sir. I don't have those with me.

Q. Okay. In 24 Yates has got an acreage position in the south half, don't they?

A. I'm not familiar with that. They may or may not. I'm not familiar with the acreage.

Q. Are there any well locations proposed in 24?

A. I think -- well, I don't know that there's an acreage or a location proposed, I do know that near where we're producing is working on developing a location in there in the west half of 24. Whether it's north or south in that section I do not know.

Q. Okay. As a petroleum engineer, have you done any pressure studies or reservoir studies that would support Mr. Beck's interpretation of this big

water?

A. Well, sir, the things that support Mr. Beck's interpretation of the big water is the fact that we have a hydrodynamically tract reservoir. The thing to indicate that we have a hydrodynamically reservoir are three: One, the whole system from the Indian Basin down through Dagger Draw when it was initially found and penetrated was subnormally pressured reservoir. It was the first clue right there that it could be related to hydrodynamics and potential surface -- actually below the surface of the ground. We had subnormal pressure reservoir.

The second clue that it's a hydrodynamically tract reservoir i.e. and tilted water contact, is the fact that we produce essentially fresh water. We produce water that have chlorides anywhere from 6 to 7,000 parts per million, which are extremely atypical for formation brines in the Permian Basin.

Fresh water typically indicates some sort of recharge. Where did the fresh water come from in other words. And a recharged system is most definitely to the west and through the high angle faults in the Guadalupes and the water moves down

through the Pennsylvanian here, and it's a hydrodynamic trap.

When you see a hydrodynamic trap you see -- no longer do you see water, oil and then a static oil gas column sitting conformably on top of the oil and water column. You will see fluids distributed off of one another and that relates, if you do a -- draw just a simple force diagram with a vector of water and the buoyancy effect of water and gravity effects of water, and put that under motion and in conjunction with the same vectors for oil and the buoyancy effect of oil, which is more buoyant than water, less gravity, less gravity effects, and the gas, which is even more buoyant than the oil -- when you get a hydrodynamic situation, they all want to move to different points. They no longer migrate to the same point over one another in the reservoir, and they're distributed differently.

Sure enough, if we look at distribution of reservoir fluids within this reservoir, we see that down dip and to the east we have oil distributed. We have a gas cap distributed to the west, and they're displaced off of one another just as you would expect in a hydrodynamic trapping and the tilting of the oil/water contact and, therefore, the

distribution of the big water. You find no water free production. You can even perforate at the top the dolomite and you're still going to make water.

Q. My question, sir, and perhaps I didn't make it clear, have you applied all of that information --

A. Yes.

Q. -- to a specific study to independently confirm for each well Mr. Beck's contouring of his location of the big water?

A. Not independently for each well, but for the two pools as a whole, yes.

Q. In this general way to see as a reservoir engineer how this is supposed to work?

A. That is correct.

Q. But when it comes to specifically locating the actual contact in the dolomite with the top of the big water, you've not independently done that as a reservoir engineer?

A. Yes, I have. Not as a reservoir engineer, but I'm also the completions engineer, and I'm the one that has been testing the location of this big water contact from well to well.

Of these of these 80 wells that we have drilled and completed, I have completed all but 19

of them that Yates operates, and we have done some experimenting with the locations of this big water contact in various wells by perforating and production testing the lower zones to see if they do have oil entrained in the water.

Q. Okay. When we apply that expertise and knowledge to the west half of 25 using Mr. Beck's Exhibit Number 8?

A. Yes, sir.

Q. You believe that you can make a commercial well at your proposed location?

A. Yes, I do.

Q. We move to the north, and we go down to 143 feet of gross dolomite above the big water, will that make a commercial well?

A. That would probably be commercial, yes.

Q. We move further north to the next location, 122, is that going to make a commercial well?

A. That will start to get marginal there as far as being commercial.

Q. And the 80 feet above big water at the McKay location, will that make a well?

A. Okay, sir. If I interpret by what you mean "by make a well," if it makes oil, gas and water, it will make a well, but it will probably not be a

very economic well with only 88 feet of hydrocarbon bearing dolomite above the big water.

Q. In the absence of a well at McKay's location, where are those oil reserves going to migrate to?

A. Well, sir, I'm not sure that they're going to migrate to any place in the immediate production future of this reservoir.

Q. Have you done any drainage calculations on the Prickly Pear well to see what areas it's going to effect in the reservoir?

A. Well, the Prickly Pear -- well, I've not done any drainage area calculations mainly because drainage area calculations within this area of the reservoir are difficult at best, and nebulous in the results of what they really mean, but I've got some data that shows something better than just putting together a drainage area calculation, and as you have yourself pointed out --

Q. What is that?

A. As you yourself have pointed out, that wells have been drilled pretty close in a 40-acre spacing in Section 23, and, if any place, there is a well -- there's an area -- where there's a lot of porosity feet of hydrocarbon bearing porosity feet

above the big water, and if any place that you would expect that there would be some effects of drainage, that's an area that we would see it.

Q. What area are you talking about?

A. The northeast quarter of Section 23. Northeast quarter of Section 23. Within that -- confines of that quarter -- we have the Hill View 5, which is in the northeast of the northeast. We have the Hill View 6, which is in northwest of the northeast, and Hill View 2, which is in the southwest of the northeast, and the Hill View 10, which is in the southeast of the northeast.

Now, the Hill View 2 is a well that we took over from Conoco and originally they drilled it and it was called the Penny Fed. Number 2, and they -- when we took that well over we had a sundry notice in to plug the well. Because of the cumulative production on that well, they have not been able to make a very good well. It cumed 65,000 barrels of oil, 373 million cubic feet of gas, and 1.1 million -- yes. 1.1 million barrels of water. Subsequently, we have come in there -- during 1990 we came in there and retreated the well, added a few more perforations, and used submersible pump technology to lift the fluids, and since then alone

we've produced 49,000 barrels of oil. Almost as much as they produced in their whole production history.

177 MCF of -- million cubic feet of gas that is, and 126,000 barrels of water, and it's still producing today 166 barrels of oil and 700 MCF a day at 4200 GOR, which is an oil well, and it makes 1500 barrels of water a day. However, after that amount of depletion with that reservoir, I would think that a 40-acre location directly offsetting it would show some effect of depletion, and when we drilled the Hill View 5, the Hill View 6 and the Hill View 10, the Hill View 5 and the Hill View 6, as you can see on Mr. Beck's map, had significantly high IPs and still have very high rates and they're not affected by drainage by wells that are 40-acre offsets.

By the way, the Hill View 6 is really the same story, only it's not quite as strong as the Hill View 5 or Hill View 10.

Q. Can you confirm that with pressure information? Is there any pressure studies available to demonstrate that wells are not interfering with each other?

A. No, sir. We don't have any pressure

information specifically in that quarter section of the field, and the reason we don't are some operational reasons as far as testing the wells, but the manner in which one has to test these wells is really to submersible pump test the well.

Swabbing does not do much for the well, and by the time you put it on submersible pump, then the access to running pressure work is gone before your eyes because at that point you cannot go in and do a buildup because you can't shut the well in when there's a submersible pump in the hole.

Q. Let me have you apply that knowledge to Section 25. When we look at the northwest quarter of that 40-acre tract?

A. Yes.

Q. Is it your opinion that the oil reserves underlying that 40-acre tract are not going to be drained by Prickly Pear?

A. That's my opinion. In the immediate producing life of that well that we will not be effected.

Q. When we look at 26 and look at the northeast of the northeast of 26, that is a proposed location?

A. That's a proposed location.

Q. When is that well to be commenced?

A. I have no idea. I do not know when that well is scheduled to be drilled.

Q. If we accept your analysis that these wells are draining limited areas?

A. Yes, sir.

Q. How many wells in Section 25 are going to be necessary in order to fully develop that section?

A. In Section 25?

Q. Yes, sir. That's the one we're worried about today.

A. Yes, sir. Within Section 25 I can see that perhaps we would drill anywhere from at least the one well Staghorn location to perhaps -- perhaps three to four wells maybe along that western line perhaps, but that's still speculative right now. As far as how many we might drill would be based upon the success and the geological result of drilling each well.

Q. I'm just trying to apply the knowledge that you've developed in this area to this particular section.

A. Yes, sir.

Q. And based upon what you know now, it's probable that the section could support four wells

in the pool?

A. No. What I said was, that right now I believe with the current base of knowledge, I know that one, possibly two wells can be supported. A third and a fourth well along that western line would only be provisional and be based upon the results of drilling.

Q. Okay. The first two choices of preferences for you are the Staghorn location and then the one immediately north of that?

A. Yes, sir.

Q. Okay.

MR. KELLAHIN: No further questions.

EXAMINER CATANACH: I have no questions of the witness. Anything further?

MR. CARR: Nothing further.

EXAMINER CATANACH: The witness may be excused.

MR. KELLAHIN: I call Mr. George Reddy.

GEORGE R. REDDY,

the Witness herein, being previously duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Would you please state your name and

occupation?

A. My name is George Reddy. I'm a geologist.

Q. Give us some background information on you, Mr. Reddy. When and where did you graduate?

A. The University of New Mexico in 1957, bachelors degree. 1961, masters.

Q. In what discipline?

A. Geology.

Q. Subsequent to graduation, summarize for us your employment experience.

A. After graduation I went to work for Exxon. Worked for them 12 years and about a year and a half with Desoro and in 1974 moved to Roswell, and since that time I've worked as a consulting geologist in the Permian Basin area.

Q. Do your consulting duties include examination of not only gas reservoirs but oil reservoirs in southeastern New Mexico?

A. Yes.

Q. Prior to the first -- prior to the current employment by Mr. McKay, have you had prior occasions to visit the Dagger Draw?

A. Yes, I have. I worked in it in the mid-70s.

Q. What were you retained by Mr. McKay to

accomplish as a geologist?

A. To evaluate his lease.

Q. Were you given any preconditioned ideas from Mr. McKay about when and where and how to develop this tract in the South Dagger Draw?

A. No, I wasn't.

Q. You were totally independent on your own to analyze the data and come to your own conclusions?

A. That's right.

Q. On prior occasions, have you rendered expert geologic opinions to the Oil Conservation Division?

A. Yes.

Q. And based on your studies, do you have opinions as a geologist with regard to items of issue in this case?

A. Yes.

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

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Kellahin) Let me ask you to give us some background, Mr. Reddy, of the kinds of things that you have done to assimilate sufficient data from which then to make your interpretation. Where did you start?

A. Well, I started with the previous -- knowledge gained from the previous study of the area for one thing, but I used data from several sources. All of the available open hole logs, scout tickets, sample logs.

Q. In addition, have you reviewed the transcripts and exhibits that were provided to you from the earlier Yates presentation that established special rules for the South Dagger Draw?

A. Yes.

Q. And you were present today during their technical presentation in this case?

A. Yes.

Q. In addition, have you reviewed and examined the data that Yates voluntarily shared with us on the Prickly Pear well?

A. Yes.

Q. The production data and the log information, and you have analyzed that data?

A. Yes.

Q. Were you working with modern geologic tools in terms of well information by which to make your interpretation?

A. Now, we are for the most part -- Well, they're more sophisticated now then they were, say,

in the mid-70s, some of the newer data, of course.

Q. For addressing the specific issues within Section 25, are you satisfied that you have had an opportunity to evaluate all available data?

A. Yes, sir.

Q. One of the issues is to determine the optimum or the least risky location in Section 25 in which to locate this first well. Based upon your studies, do you have a conclusion about that issue?

A. I believe to make an oil well the most -- the least risky location is the northwest quarter.

Q. Do you have a recommendation to the Examiner as to the orientation of the spacing unit for production in this pool that allows for the full development of this section for pool production?

A. Yes.

Q. And what is that recommendation?

A. East west units, that is, lay down units.

Q. Okay. Give us a brief summary and then we'll go into the specific display and the details, but give us a brief summary of the key elements as you see them as a geologist that caused you to conclude that the northwest of the northwest was the best location to pick in this section.

A. Well, the two elements, of course, is the

distribution of the host rock, the reservoir rock, which is the dolomite that has previously been discussed, and within that key elements are the distribution of porosity within that dolomite, and the third would be the oil/water and the gas/oil contacts.

In that regard I tend to agree with previous testimony that these are indeed, tilted contacts, and tilted by a hydrodynamically active system. The tilt of which is predominantly from west to east.

Q. Wherein do you differ with Mr. Beck concerning the geologic interpretation?

A. Well, what we've seen and from previous hearings, and what we see today, is their big water map. As best I can tell from looking at the previous one and checking this one today, we're talking about basal perfs. You can draw a basal perfs map anywhere you want to, but -- and you can call it what you want to, and I like that name, big water, but they're making a lot of big water above those perfs in many wells, so I don't really feel like we've defined the hydrodynamic surface that they refer to by mapping basal perforations.

Perforations are picked on porosity.

Porosity is distributed erratically within this carbonate reservoir, and the hydrodynamic surface that they're referring to is not necessarily with the basal perfs.

Q. Mr. Beck chose to describe for us this gross dolomite interval before his pick of the big water. What have you done to give yourself an interpretation of the distribution of that dolomite?

A. Well, you refer to structure, and I would agree that's a good name to call the top of that stratigraphically rising and falling surface, the contact between limestone and dolomite. You call that a structure. That is in that since it is. You can map the top of this host reservoir, but there is another structure alone that needs to be considered, and that is the stratigraphic horizons, as he did mention that these predominantly are east -- west to east dip, but if you break the total unit down, you can subdivide it within the field.

Q. Let's talk about the subdivision so that we have a usable nomenclature. How have you chosen to subdivide this gross dolomite?

A. Well, I've just broken it into three zones, A, B, and C going down section. They're based on correlations of the logs within the field. And

within the field itself I feel that they can be correlated very well. As you get out onto the flanks it becomes more difficult because some of these thicken, especially on the east side, but it overall represents top to bottom -- top to base of the carbonate reservoir.

Q. How does that help that division of the reservoir into zones or sections? How does that aid you as an exploration geologist in picking the optimum location to recommend for the drilling of the well in Section 25?

A. Well, you can map the porosity patterns within each zone. You can pick net feet of porosity above a given cutoff, and you can map that, and in doing so you can get some idea as to where within any location which of those three zones you are apt to most find porous dolomite in, and that's where we're wanting to go. We want to find porous dolomite above water, big water.

Q. Let's proceed through your displays and how you went about doing this study. Let me direct your attention to the index map marked as McKay Exhibit 1. What is indicated on the index map?

A. Well, it's kind of the general map for the lines of section that were drawn there. I think six

lines of section, one of which is on the wall. The others are on these ledger-size exhibits. It shows the location in the northwest quarter from Mr. McKay's proposed wells, and it shows the location -- it was shown as a location on the map in the southeast of 23 of the Prickly Pear well, and there also are some reference wells indicated, which are on -- or are referred to -- on the big Section F F' on the wall. Well two in the southwest of the northeast quarter of 23, I believe that's the -- I've forgotten the name of the well. It's the old Conoco -- Conoco well.

Q. Let's go about building the structural description of the reservoir by looking at the various cross-sections, and let you describe for us what the cross-sections show you. And let's start with the A A', and first of all, orient us. We're starting at the south end of the reservoir as currently developed and looking north as we move up towards the North Dagger Draw?

A. Yes. On the north -- or the south end -- there is the Roger -- well drilled by Roger Hanks, the Preston Fed 1, which was completed as a gas well in the lower portion, and what I'm calling Unit C of the total section. The vertical bars on each well

represents the perforate -- overall perforated intervals in each of the wells shown on the line section.

Q. What does it tell you?

A. The lighter line at the top shows the facies change from dolomite to limestone, so on the previous structure map that we've seen it would be -- that would be the surface that will be mapped using Mr. Beck's parameters that he is showing, as I understood it. On the far end of -- on the north end of it is the Yates Hill View AG Fed Com. 1, which has low oil by perfs.

This section minus 4205, and that's shown as references three and five on the larger cross-section on the wall. Most of the rest of these -- well, all of them -- are west east cross-sections to show the cross-sectional view of the reservoir facies, so B B' shows that in the Conoco Preston Fed. 2 on the west side, or the left side of the diagram --

Q. I haven't left Exhibit 2 yet, which is the A A'. Let's start with that one, the A A'. What are the major components of the structure that are of importance to us as we try to decide how to resolve this case?

A. Well, the sub units show north dip. The dolomite on that line of section shows north dip and then south dip on a portion of it, a good portion of the east half of it.

Q. So, as we look north south then you've identified a structural control point that you can now run cross-sections perpendicular to this control line and begin to get a sense of the size and the shape of the structure as we move to the east and the west side of this control point?

A. Yes.

Q. Okay. Let's do that now and let's go to the B B', and begin to see what the southern part of the structure looks like as we look at it from east to west. What does it show you?

A. Well, it shows, again, only the Roger Hanks Preston Fed. well to be the highest well on this structure, both in terms of the top of the dolomite and in terms of -- well, in terms of dolomite. The other well to the west is slightly higher structurally than the Preston Federal on the two upper zones.

Q. You have in the center of the cross-section this Marathon well that we've talked about previously in the hearing?

A. Right.

Q. What are the important elements from that Marathon well that you need to describe to us?

A. Well, the completion in the Marathon well is in the upper most of these vertical bars above the -- Upper Penn Unit A. That BP showing on the diagram is a bridge plug that was reported. They perfed lower zones prior to that, they acidized, and it's a light -- it was a light treatment by acid of those zones, and there's no record that I could get of the recoveries in that part of the well.

Another thing on this line of section is this shale wedge of Unit B that is encountered in the Indian Hill State Com. That's not seen on every line of section, but it does extend beyond -- or into the massive portion of the dolomite reservoir, or toward it, from that well.

Q. What does this wellbore tell you about the C Zone?

A. Well, it tells me that it -- well -- on this diagram it tells me that it's very thick.

Q. Was it tested for production?

A. Yes, it was.

Q. All right. As we move then -- this is giving you your structural pattern in the southern

portion of the reservoir as we move up to the C C'. That's Exhibit Number 4?

A. Yes.

Q. Identify and describe what you're seeing here?

A. Well, referring that back to Exhibit 1, which is the index map, again, it goes from the Conoco Preston Fed 2, which is a dry hole on the southwestern corner of the mapped area, and I have some of the older names on these, but the Roger Hanks Robin Fed 1 and the Dagger Draw Conoco Vicki Fed 1, and the -- then we go to the Wildcat -- the Coquina R.S. Fed 1, that would be the third well from the right, and I'm showing Mr. McKay's proposed location on this diagramatic representation of the reservoirs.

Q. And this is the first cross-section we come to in which we have the Coquina well as one of the wells for controlling your interpretation of the structure?

A. Yes.

Q. And in terms of the structural position of McKay's location to the Coquina well, you're moving up structure?

A. Sorry?

Q. You're moving up structure at the McKay location on the Coquina well?

A. Yes. In both cases, in terms of the dolomite top of the dolomite, and in terms of these three units that I'm mapping.

Q. All right. When we get to Exhibit 5 which is the D D' cross-section?

A. Yes.

Q. Describe for us what's happening in the reservoir structurally?

A. D D' starts on the southwest quarter of Section 22 on the west side. It has a low proven gas minus 3893 in that well.

It's the Yates HT Hagar Carl TP Com 2. It goes through the Saquaro HGS Fed Com 5, which is perforated in my B and C Zones. The Conoco Penny Fed 2, which, again, was perforated in the B and C Zones, and on this line of section that would be the lowest perfs shown.

On the next well in 24, it goes through Monsanto Mayer which had a rather thick section of dolomite, but mostly in the C Zone, and I picked a little bit in the Nix IT Com 1 in that zone. So the dolomite reservoir, as I see it, extends throughout this side until you get beyond the NIX IT Com. 1

eastward.

Q. Okay. Then we get to the northern portion of the interpretation. Exhibit 6 is the E E'?

A. Yes.

Q. Describe that one for us.

A. Again, it starts up on the west Saguaro AGS Fed Com 2. We perforated down to minus 4,008. It was shown on the books as an oil well, but had a very high gas/oil ratio. The next one is the Saguaro AGS Fed. Com. 1 which was perforated in the B and C sub units. Looks like at the very top of that same -- well at minus 4008.

The Saguaro AGS Fed. Com. 6 is the next well along the line as completed in the B and C Zones, mostly B., and the Hill View HE Fed. Com. 1 low perfs at minus 4208 and was completed in the A and B portions of the total mass.

Q. Having prepared your cross-sections, did you then prepare a gross isopach of this dolomite?

A. Yes.

Q. Let's turn to that. It's Exhibit Number 7?

A. Yes.

Q. What's the purpose of mapping this gross dolomite?

A. Well, it is, as mentioned, the -- it's the

host rock for the reservoir and South Dagger Draw field, and it would be good to see what it's limits are.

Q. This gives us a distribution both horizontally and vertically of the thickness of the gross dolomite?

A. Of the gross thickness. Now, on the east side it would include, as I mentioned, that shale wedge that comes up through the Marathon well, and so you're going to see that thickness included in portions of it, but yet it's the gross thickness.

Q. At this level of geologic investigation, can you make any conclusions about well locations or orientations of the spacing units based upon the gross isopach?

A. No.

Q. You had to take your level of geologic investigation a further step?

A. Yes.

Q. What did you do?

A. Well, in conjunction with this -- are we ready to go to Exhibit 8?

Q. Yes, sir.

A. Okay. I made a map, I think, that's similar to the one that Mr. Beck was showing, and, I

mean, it was on the same data. That is the top of the dolomite -- Upper Penn dolomite -- and that's what this is showing. It's contoured on an interval at 25 feet, and I've just taken the contours out to the limits that are shown on the previous map. It shows the axis of this feature starting down in about the southwest quarter of 35 and curving northward right on the oil trends.

Q. Having now given yourself a contour map of structure on the top of this dolomite, having developed a gross isopach, did you then attempt to develop isopach on the individual members of that dolomite?

A. Yes.

Q. The top one you've identified as the A carbonate?

A. That's right.

Q. Let's look at that map.

A. Okay. Now this is net feet of dolomite that has a porosity of two percent or greater. Greater than two percent, I should say.

Q. So your porosity cutoff is greater than two percent?

A. Right.

Q. So you're mapping everything that shows on

the log to have a porosity higher than two percent?

A. That's right.

Q. For the A carbonate?

A. For the A Zone only.

Q. Okay. What does this show you?

A. Well, it shows that the A Zone is thick relatively speaking in the Marathon well, and also to the north in this area where in some of the wells they've completed in the A Zone.

Q. Well, the Marathon well is completed in this A Zone. It is, is it not?

A. Yes.

Q. That's the sour gas well that Marathon has?

A. Right.

Q. Geologically, what does that begin to tell you about the south half of Section 25 in the A Zone?

A. Well, it's beginning to tell me that in this zone -- at least in this zone -- it would be more gas prone at the southwest location than in the north location.

Q. Okay. As we move down into the carbonate now and get into the next zone, the B Zone?

A. Yes.

Q. Isn't the object of the exercise to find

oil?

A. Well, that seems to be what's been happening out there.

Q. Can you find it in the B Zone?

A. Yes.

Q. How have you mapped it?

A. Well, I must say that prior to receiving the data on the Prickly Pear well I didn't have quite as much of a thickness for the B Zone mapped into Section 25, but I find porosity in the B Zone there, and it's created a porosity thick with respect to wells on the west, and it's logical to draw then the zero line farther west in Section 25, and what it shows me is that there's about -- by mapping -- there's about 15 feet -- well, 15 -- 10 to 15 feet of porosity of porous dolomite in the B Zone.

Q. Let's go down to the C Zone.

A. That's -- pardon me.

Q. I'm sorry. Go ahead.

A. That's at the McKay location.

Q. Yes.

A. At the Yates location I'm showing about 60.

Q. McKay Exhibit 11.

A. Okay.

Q. You're mapping the C Zone dolomite?

A. I'm mapping the porosity greater than two percent in that C Zone dolomite.

Q. What's your conclusion?

A. My conclusion is that the Coquina well is in a porosity thick within the C Zone. The only zone that is present in that well that is dolomite, and it is on trend in that thick with some very good wells that are back to the northwest, and that the Yates location in the southwest southwest of 25 is in a -- relative to that -- it's in a porosity thin of about 33 feet.

Q. The Yates location is 33 feet, and up in your location it's what, 70?

A. No. I stated that that way, but at the location itself I'm mapping in a 50-foot thickness.

Q. Okay. Having prepared isopachs on these three zones now, what is the next thing that you want to have investigated before you decide what is the optimum location in which to propose the well in Section 25?

A. Well, knowing that there is associated gas, and that some of the wells were completed in that zone, not many of them, but some out on the west side were, I'd like to know as best I could, where

the low gas would encounter each of these zones, and where the oil -- oil prone area is within each of these zones.

Q. And have you prepared a map that demonstrates that?

A. Yes.

Q. Let's go to Exhibit 12?

A. This is a structure map primarily on that A Zone showing east dip, and it's -- in addition to that are the limits to the dolomite, the dolomite porosity, that occurs in the A zone. It's contoured on 20-foot contour intervals. It's showing me that both locations are in a gas prone area in Section 25 in this zone only.

Q. What have you used to control the limits of this dolomite porosity that's placed in the darker line on each side?

A. Oh. Well, those would be from the previous maps. In part it would be the limits shown on the total dolomite isopach, and where the porosity pinch-out diverges from that inside the field, it traces the edge of the A Zone porosity, a pinch-out.

Q. Okay. As we go to the B dolomite, what did you want to know with this display?

A. Well, may I go back here a moment?

Q. Sure. Which one?

A. To Exhibit 12.

Q. All right.

A. I've shown the oil prone area too that I think may occur, and I've based it on the low perfs in this well in the northwest quarter of the northwest quarter of Section 12 where actually this falls below the low perfs that were in that well minus 4,000.

Q. All right. And that's shaded in the green, and this is for A carbonate?

A. Uh-huh.

Q. All right. As we move into an examination of the oil prone versus the gas prone areas in looking at the B dolomite, you've prepared Exhibit 13?

A. Yes.

Q. Okay. What's your conclusion?

A. Well, the B dolomite looks like it would be in the oil leg to me in the northwest location and in the southwest location, but very near that minus 4,001 which is the -- I'm sorry -- the base of -- basal perfs in the Preston Fed. 2.

Q. Then finally, let's look at Exhibit 14 and see what your opinions are concerning the oil

potential in the area in that C dolomite. What do you conclude?

A. Well, I can say that both wells will encounter -- they're in the oil prone location. Both locations are in the oil prone interval, but having already looked at the isopachs in these zones, it appears to me that we would a lot more -- we would have more net pay in the northwest quarter of Section 25 than in the southwest quarter.

Q. Mr. Beck has placed great emphasis on the drill stem test in the Coquina well?

A. Yes.

Q. From which he has concluded that that is a reference point for establishing control for big water, and that you cannot expect to have production in the dolomite that is down structure from the position of that well. Have you examined that topic?

A. Yes.

Q. Can you illustrate for us on Exhibit 15 the conclusions you reach about the data derived from the drill stem test on the Coquina well?

A. Well, the drill stem test tested --

Q. We're going to have some trouble here, George. You're going to have to figure out how to

stand so that you don't block everybody. All right. Try again.

A. Okay. The drill stem test tested across the upper part of this dolomite. It was an hour and 15 minute test. It had 2887 initial and final shut in. It recovered 1457 feet of sulphur water that would amount to be, I believe, about 21 barrels of oil. It was a very short test.

Q. Have you gone back and calculated water saturations from that well?

A. Yes, I have.

Q. Give us a general range of the values that you've calculated for the water saturation in that well?

A. Well, I've compared it with the well up dip here, the Prickly Pear.

Q. That's the one that Yates just completed in the southeast of the southeast of Section 23?

A. That's correct.

Q. And have you done a similar analysis of that well and made water saturation calculations based upon those logs?

A. Yes, I have.

Q. Make the comparison.

A. Okay. The first big question is, as

mentioned earlier and I agree, it's fairly fresh water, but in earlier testimony on previous hearings, data was furnished that indicated it ranged from about a .48 to a .26 among the wells that were presented in that formation temperature.

In trying to use those I found that where it looked like it was the wettest, which can be assumed to be mostly, or almost likely to the water zone among the ones tried, about a .3 seems to be the proper RW to use at formation temperature, so that's what I used in this area.

And now to show you in the Prickly Pear to begin with, up in this area, I have a water saturation of 23 percent, 41, 59, 44, 68 percent, 30, 20, 20, 19, 19, 42. There's a 17, also a 74 percent water, 78, 41, and 39, and this one here 73 percent.

Now, this is a modern log. I made the corrections to get maximum recistivity. This one is -- it wasn't as complete a log. We had a dual lateral log, and this is in that density. And I have water saturations calculated here 31 percent, 28, 35 23, 42, 38, and 34 percent, and they get higher here, 59 percent and 58.

Q. Was does that tell you?

A. Well, it tells me that as far as you can use log analysis, that this is a comparable well in terms of water saturation. It's a little higher but not much, and we've already agreed, I believe, that this is a common reservoir. Well, not very much in there that salinity throughout the reservoir within this area, at least that we're looking, and so I would rely to some extent on this and certainly wouldn't condemn it on the basis of that one hour and fifteen minute drill stem test.

Q. Are there examples in this pool where a drill stem test will show nothing but water or a small or slight show of oil and gas and subsequently result in a well that produces substantial oil?

A. I don't have the volume of the oil that it's producing, but one of the wells that's referred to here, the Hill View AHE Fed Com 1 perfed down to 4207 feet, and I've just plotted this number three.

It would be the lowest perfs where it would show here. It was drill stem tested and recovered similar amounts of water. There were no details given on the PI report as to what pressures were, but it was later perfed in that same interval.

Another well, the Cezina AGZ Com 3, is a producing well indicating the data is producing and

it's been perfed down to below minus 4256, which is this line, and to me, even though I've shown these horizontals here, this represents what's earlier been said that we do have probably a lower oil/water contact on the east side than we do on the west side.

Then there's a log analysis and AHE Fed Com 1 minus 43336 near the base of the carbonate, and it is treated the same way as these others. It had a water saturation of 30 percent calculated.

Q. When you put this all together as an exploration geologist, Mr. Reddy, and if you were to invest your money in one of these wells, where would you put your money?

A. I would put it in the northwest quarter.

Q. Would you put it in the southwest quarter?

A. No, no.

Q. Summarize for us the elements then that have caused you to reach the conclusion about the northwest quarter?

A. Okay. Going back to the tilted oil/water contact, it's got -- definitely got a west to east tilt on it, but I do question that any of us can pin that down with a data that's been relied upon to describe it at this point. So I would stay with the

west to east tilt on the water table through most of this.

And then for that reason I will rule out Upper Zone A as big oil productive in this southwest location. I think you'll have some B but it would be very thin in terms of porosity, and you won't have as much net feet of pay in the Z Zone, so I think you can get a thicker pay zone in the northwest quarter of Section 25 than you can in the southwest in terms of oil production.

Q. Is there a sufficient difference in structural position to make that difference critical in picking the location?

A. When looked at on top of the dolomite there's quite a bit of difference, but when you look at it on top of the dolomite, you're climbing up through these stratigraphic horizons in the gas cap or into the associated gas prone portion of the section. When you look at it on the sub unit structure there' not a substantial -- there is a little bit higher -- it's a little higher at the southwest location by about 20 feet.

Q. Is that enough of a difference in the structural point sub structure reservoir that you would want to choose a point that was 20 feet higher

but not as thick?

A. If we were just talking about oil that would be -- that would be indeed, but because we're getting up into a more gas prone area with two of the three zones -- well, perhaps three of them although I would say that C is not as apt to be -- it's kind of a trade off structure against staying in the oil column.

Q. In applying that criteria, are the objectives to stay in the oil column the best location then in all of 25 is 660 out of the north and west of the section?

A. Yes.

Q. And any other 40-acre tract is less favorable than that location?

A. Yes.

Q. How do you deal with the orientation of the spacing? You have two choices. You've got a west half, east half, or you can lay them down have north half, south half. What's your choice?

A. Lay them down north half south half.

Q. And why would you make that choice over standing up a west half unit?

A. I believe the reserves that are in Section 25 can best be produced most efficiently in

that arrangement.

Q. If you stood the spacing units up, are there oil reserves in the east half of the unit that would be contributing to production in the west half? You've shown on some of your displays some potential in various zones in the east half, have you not?

A. Yes. Yes, there would be some contribution from the east half. If you drilled in the southwest quarter there is the risk, though, that you would not be able to produce the oil in this Unit C, particularly if it's classified as an associated gas well. And you've really ruled out more drilling, I believe, in that arrangement.

Q. I'm going to reserve the question of the penalty to Mr. McKay to address because he has to make that judgment about the penalty factor, but in assessing geologic risk, you've described preference. Have you reduced that to trying to quantify it in terms of a percentage, and if not, fine, and if so, what is it?

A. I can't put it in terms of a percentage, but for Unit C I would say that the chances -- I mean, I cannot do it for all units -- but in Unit C the chances in the south of the northwest quarter

are very high. Something on the order of 90 to a 100 in the southwest quarter in that same unit. I give it more chance than any of the other two for getting oil. I give it 70 to 88 to make it commercial.

Q. If the unit is laid down, then both competing operators, or working interest owners competing for operation, would have the opportunity to drill their location of preference, would they not?

A. Excuse me, Mr. Kellahin, I think I misstated that last -- can I make a correction?

Q. Well, we were talking about trying to put a percentage if you wanted to on the risk of either a dry hole or a commercial well. However, you want to define it as we look at the various zones between the two locations.

A. Well, when I said commercial I would give it 70 to 80 percent that, yes indeed, they'll make some oil, but they'll make a lot of gas in that location if they complete as they have to in the north where they're completing throughout down to wherever they consider the base of the top of big water, and if they do that they're going to have a very high ratio well in my opinion, so my statement

of putting that percentage on it as being commercial in terms of oil, it was not right.

Q. If the spacing units are laid down, that would give each working interest owner that is competing for a well location the opportunity to drill their location of first preference, wouldn't it?

A. Yes.

Q. And if we stand it up on the west half, the examiner has to choose one or the other, doesn't he?

A. Yes.

MR. KELLAHIN: That concludes my examination of Mr. Reddy. We move the introduction of his Exhibits 1 through 15.

EXAMINER CATANACH: Exhibits 1 through 15 will be admitted as evidence.

(McKay Oil Corporation Exhibits 1 through 15 were admitted in evidence.)

CROSS-EXAMINATION

BY MR. CARR:.

Q. Mr. Reddy, when were you retained to conduct your study of the South Dagger Draw Upper Penn field?

A. I was first approached -- I did not know Mr. McKay had a lease down there, but he first

approached me in September of last year, and he retained me in May of this year, early May.

Q. I believe you stated that you had previously worked on this field?

A. Yes.

Q. And when was that?

A. 1977.

Q. Have you worked on it since 1977 until Mr. McKay contacted you?

A. No, but it was nice revisiting it because it seemed to fit the old picture very well.

Q. Part of your review, if I understood Mr. Kellahin's questioning, was reviewing certain transcripts and exhibits that related to the actual promulgation of the pool rules for this pool; is that right?

A. Yes.

Q. Wasn't there testimony in those transcripts that indicated the spacing in this pool really wasn't based on the number of acres that the well would be expected to drain in the reservoir, or do you recall?

A. I reviewed the geological portions of it and I do not recall that part.

Q. If we look at your exhibits and we go --

let's go to Exhibit Number 3 -- and we look at the Marathon well in the center of that cross-section that's on the zone B B'?

A. Okay.

Q. Do the black lines on the right-hand side of the wellbore indicate zones that were tested?

A. Yes.

Q. And so, apparently they tested low in the well?

A. Right.

Q. Do you know if that tested wet or not at that interval?

A. No. As I mentioned, I don't know. I couldn't -- I could not tell from the --

Q. But do you know which of these intervals they actually completed in?

A. Yes. It's that uppermost vertical bar.

Q. And so they were completing just in the top of the dolomite as it appeared in this well?

A. That's right.

Q. And isn't it typical throughout this field that you get gas in the top of the dolomite?

A. Yes.

Q. Okay. Now, if we go to your next exhibit --

A. Not throughout the field.

Q. But generally when you're perforating a zone in the dolomite, if you get right at the top of it, isn't that where you would expect to get your gas?

A. You would find the gasiest portion -- gasiest -- if that's a good word -- portion of it in that uppermost perf, yes, but I don't want to go over that further.

Q. Do you want to go to Exhibit 4 with me?

A. Yeah.

Q. By looking at Exhibit Number 4?

A. Okay.

Q. And on this -- this is the cross-section on which you've placed the proposed McKay location?

A. Right.

Q. And at that location you have -- just as we move from east to west, moving from the Coquina well -- you all of a sudden see a thickening in the dolomite; is that what that shows?

A. Yes.

Q. Now, this interpretation is constructed just on well control; is it not?

A. That's true.

Q. And isn't it possible that based on well

control that that build up might be somewhat farther to the west, not right there?

A. It is not possible that that well -- well, it's possible, but it's not likely because of your new well, which is not on this line of the section, but it has shifted the crest of that dolomite top.

Q. And when you talk about the "new well," you're talking about the Prickly Pear?

A. Yeah, Prickly Pear.

Q. Now, was this exhibit prepared prior to the time you had any information on the Prickly Pear?

A. Yes.

Q. And whereabouts on this plat would the Prickly Pear actually be located?

A. Well.

Q. Would it be as far -- we don't have to get exact to it -- but as far to the west as, say, the difference between the Coquina and proposed location, or would it be closer to that?

A. Well, in terms of where I show the crest here, it would be located just west off the crest.

Q. Do you agree with Mr. Beck that moving just 40 well locations you may see a very pronounced change in the dolomite that you encounter in this reservoir?

A. I would agree with that.

Q. And isn't it possible the new Prickly Pear location is a 40 location, or at least west of the proposed McKay location; isn't that right?

A. Yes.

Q. And it is possible that you could see this change in the dolomite somewhere to the west of the McKay well; isn't that correct, their proposed well?

A. Very unlikely. You're going to see most of what you saw in the Prickly Pear.

Q. But you would agree that if we go to the north, say up to the -- I don't have the names of the wells. You go north to the wells, the wells between, say, section -- the easternmost wells in Section 11 and the westernmost wells in 12, there was a sharp difference in the formation between those. All right. Without the names on these I'm scrambling, but there's a well in the southeast southeast of 14?

A. Yes.

Q. And if you move to the 40-acre offsetting location to the east of there being in the southwest of the southwest of the 13, there was a dramatic change in the dolomite; was there not?

A. Well, let's see. Let's look at the top of

that dolomite structure.

MR. KELLAHIN: Give us an exhibit number, Mr. Reddy.

A. I'm sorry. It's Exhibit Number 7. No, it isn't. That is the isopach.

Q. (By Mr. Carr) We're talking about the Hill View Number 7 well.

A. In the southeast of 14, southeast southeast.

Q. Yes. As compared to the well immediately offsetting it to the west being the Hill View Number 8?

A. Well, you have me there. I don't have that well. That's still tight I guess.

Q. Was Mr. -- But you did state you didn't disagree with Mr. Beck that you could find dramatic changes in the amount of dolomite available between wells on offsetting 40-acre locations.

A. Now we're talking about the thickness of dolomite; is that right?

Q. Yes.

A. Yes. Yes. Well, especially on this west side, which I believe you used as an example where you go -- I show 292 feet to zero. I'm on Exhibit 7 now, and I think that's the same one he showed.

Q. Do you agree that also -- that dramatic change occurs on the east side of the reservoir?

A. It probably does in places, although I don't see an example of that sharp a change in the data I have available to me.

Q. And yet, even if that did occur, you don't believe it would occur between your proposed location and the offsetting Prickly Pear?

A. I don't believe it would. I don't believe it's likely to occur that quickly because you were coming up on this feature between these two -- between the -- we're back on -- no, we're not. I'm showing on the wrong map. We're back on Exhibit 8. You're coming up structure to this one. I've shown it turning off pretty close, but it doesn't -- we've got the dolomite here. We've got a point there. We're going to be between them in this C Zone.

Q. And is there any control other than the Coquina well and the Prickly Pear that you could look to identify where this abrupt change may occur?

A. No, I don't have seismic.

Q. Okay. If we go to your Exhibit Number 7? This is your gross isopach map. We look at your -- the proposed location. You've also indicated, if I

can read the numbers here, that we're what, 192 feet in the Coquina well that immediately offsets the proposed location to the east; is that what that says?

A. I'm having trouble reading those too. Let's see. That's right. That would be 192 feet.

Q. And they were unable to make a well. They did not make a well; is that correct, in the Coquina?

A. Other than the test, they didn't attempt a well in this zone.

Q. And then you have run your own calculations on the well, and if I understood those, it was that perhaps it might be comparable two wells further to the east, and if so, it might be able to be produced?

A. If I said further to the east I misspoke.

Q. I'm sorry. I misspoke. I mean further to the west.

A. Yes.

Q. And that it might be commercial based on the calculations and analysis that you performed?

A. To the extent -- and I acknowledge that you've got to rely on other things, but to the extent that you can compare log analyses in this

area, yes.

Q. Does McKay have any plans if his application should be granted to reenter and try to recomplete that Coquina well based on log analysis?

A. We've discussed it.

Q. Would you recommend that on the log analysis alone?

A. I would recommend drilling rather than reentering in this leg based on what we find in the log analysis. This location meaning the northwest northwest.

Q. The proposed location?

A. Yes.

Q. As opposed to relying on the log analysis for reentry?

A. Yes, sure.

Q. Now, if we look at the information you have on Exhibit Number 7 in 25, we look at a well in the southeast of the northeast of 25. That's shows no dolomite; isn't that correct?

A. That's right.

Q. Now, if we take a look at your last three exhibits where you have indicated the gas and the oil producing zones?

A. Yes. I know the ones you're referring to.

Q. Let's go to Exibit Number 14. This is the last one?

A. Okay.

Q. You disagree with that lower portion of this reservoir off in the dolomite is wet and there are portions of the lower dolomite that therefore, cannot contribute production to a well?

A. I'm sorry. Would you ask that again?

Q. Do you agree with me that lower portion of dolomite in this pool is often wet?

A. I agree with that.

Q. And that when it's wet it wouldn't contribute production?

A. When it's 100 percent water saturated it would not contribute production.

Q. And that we find the water primarily in the lower zones?

A. Yes.

Q. And so in the C Zone, that's almost likely to be wet?

A. You really can't say that. It depends on where you are structurally.

Q. What about -- let's look at 25 on Exhibit 14.

A. But you've perfed in the C Zone in many

wells out here.

Q. My question is, in Section 25 as you've depicted on Exhibit 14, that's the lowermost zone; is it not?

A. Yes, it is.

Q. And that would be the zone that would most likely be wet if we encountered water in this area?

A. No, I can't say that.

Q. You would say that it is just as likely that the B zone would be wet?

A. In Section 25?

Q. Yes.

A. Let me look at the B Zone. It's just as likely that the B Zone will be gone in most of 25, but where it's present it will be -- most likely to be oil.

Q. But would it be water saturated?

A. No, it won't be water saturated.

Q. You don't think -- do you think C might be water saturated?

A. No.

Q. And you don't think --

A. I don't think -- if you mean by that 100 percent water saturated, no, I don't.

Q. You don't know this side of 100 percent?

A. Well, I'll use what I calculated. It would be somewhere --- where I've colored in green up there I'd have to look at them again, but I believe they range from somewhere between 21 and maybe 45 percent.

Q. When you were doing the calculations, did you integrate -- you integrated into that calculation, I guess, on the Coquina well, the drill stem test information, or is this just a separate set of data that you used to evaluate the well?

A. It's a separate set of data. I studied the drill stem test data, and in studying that with other tests that had been made in the field, concluded that it's not conclusive. We can't rule out --

Q. Is there any mud log information or anything else you could use to establish this?

A. I had none. I looked for mud logs in the library.

Q. Any information on perforations that might shed information on that area?

A. No, it wasn't perforated.

Q. You don't discount perforation as being something you would consider in determining where the water would be, would you?

A. If you perforated and all you get is water, then you can say that you're in big water, but you cannot say that's the top of big water. And if you go up the hole a few feet or several hundred feet and you perforate again and get some water, I don't believe you can say that -- that you're at the top of big water. Perforations in themselves will not define hydrodynamic surface.

Q. If you could scientifically pick big water, that's an assumption, you wouldn't perforate into it, would you?

A. No, you wouldn't.

Q. I thought that was an obvious question, but the perforation and the zones that are perforated is a factor that you would consider in trying to pick the oil/water water contact in the reservoir?

A. Please ask that again.

Q. You would consider information from perforations if you were attempting to find the oil/water contact in a reservoir?

A. Yes, you would.

Q. That would be one of the tools you would look to. If we look at your Exhibit Number 12, which is your map on Zone A, how much of the north half of Section 25 would you estimate to be capable

of contributing production to the well?

A. To the well in the northwest quarter?

Q. Yes, sir.

A. In Zone A it's maybe 100 acres, or 120 acres perhaps.

Q. And that would be just gas contribution?

A. Yes.

Q. And in the south half of that section we'd have almost 100 percent of it could contribute in the south half to a south well, right?

A. Yes, but in a lay down situation 100 percent of the 320 acres would be much closer to a 100 percent in that arrangement.

Q. If we have a stand up west half unit, how much of the acreage dedicated would at least be able of commercial or production? 300 acres something like that? 270?

A. Well, I'm showing approximately what you stated. I guess as being gas prone, yes. Whether it would contribute that to one well, I'll leave that for the engineer.

Q. Okay. In terms of the map on the B Zone, how much of the north half unit would you estimate would be underlying with production in Section 25?

A. Perhaps 90 to 100 acres of the north half.

Q. And what about in the south half?
A. About the same.
Q. And in a west half unit?
A. About 160 I suppose. Something on that order.
Q. There's nothing in the B Zone that would contribute to a well in the west half; isn't that correct?
A. I'm sorry?
Q. There's -- this doesn't indicate that there's any production potential in the B Zone in the east half?
A. In the east half, true.
Q. So, if we look at these three zones and you were asked to define the area that was productive in this reservoir, what 320 would you select?
A. I'm sorry. I'm not getting your -- it's not you. I didn't --
Q. It probably is me. If we were trying to pick one 320 tract in Section 25, either a north half south half, east half, or west half; isn't it true that the west half is the 320 that would appear to be most likely to conform with the producing zones in this reservoirs?
A. I would say that the 320, as I have it

mapped -- the west half of 320 I'm showing 320 acres in that zone. Is that what you're getting at?

Q. Yes, sir.

A. I can't deny that.

Q. Okay.

MR. CARR: That's all I have.

EXAMINER CATANACH: I don't have any questions.

CHARLES SANDERS,

The Witness herein, being previously duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN.

Q. Mr. Sanders, for the record, will you please state your name and occupation?

A. I'm Charles Sanders, engineer.

Q. Mr. Sanders would you summarize your educational background and your employment experience as a petroleum engineer?

A. I graduated from Texas Tech University in 1950 with a BS in petroleum engineering geophysics option. Worked for three years for -- I'll call these companies by their present names so that people will know who they are -- for Ork Energy in Breckenridge, Texas, west -- north central Texas

area. After three years there of drilling and completion work, I moved to west Texas and worked for what is now Bass Brothers Enterprises for 16 years, and during this time we worked all over west Texas and southeast New Mexico.

I was hired primarily to go into New Mexico, but some of our acreage didn't develop so that didn't pan out, but I still worked southeast New Mexico, and after 16 years I moved to Albuquerque in 1969 and worked for the Puebco Petroleum for four years at which time Mr. Boone Pickens made Puebco his first conquest, and so Puebco was no more.

I worked briefly for Coke Oil Company for about six months in the Wasatch Basin in Denver area; Wasatch Basin of Utah, and had an opportunity to come back to Albuquerque. And I worked for Petroleum Development Corporation from 1973 to 1987. I was vice president in charge of engineering for Puebco and we had vast operations in the southeast New Mexico.

And then in 1980 I went independent, and for 9 years I did my own thing, by drilling, exploration, turning deals. In 1989 I was squeezed out by economics so I became a consultant, and I now

teach. And so I'm vice president of World Petroleum which is a drilling, completion, and well control technology company, and I teach -- I teach a course in well completion and work over for Merchanson drilling schools, and I also teach well control operations for both completion and drilling for Merchanson.

Q. Mr. Catanach wants to know why you didn't go to school in Soccoro?

A. Well, it hadn't been invented then.

MR. KELLAHIN: I tender Mr. Sanders as an expert petroleum engineer.

EXAMINER CATANACH: He is so qualified.

MR. CARR: He would object if he had gone to school in Socorro.

Q. (By Mr. Kellahin) Mr. Sanders, I don't want to scare everybody, including you and me, with the volume of information you've put in your exhibit book. I don't intend to cover it all with you. I would like to go into the key components of your efforts to analyze this reservoir for Mr. McKay.

Let me ask you, sir, to focus generally on your comments and observations as a petroleum engineer in terms of what you assessed to be the least risky, if you will, the optimum location in

which you would recommend to a client to put their funds to drill for the South Dagger Draw production in Section 25?

A. All right. I centered my initial study on the Number 2 and Number 4 Hill View unit because they had longer production histories, and because they were the northwest adjoining and offsetting acreage to the proposed McKay location and looked to me similar geologically.

The comparison of the areas, I think, is obvious in terms of porosity -- as Mr. Reddy has pointed out -- proximity. Certainly, if I am trying to sell a prospect I want to be as near offset production as possible, so nearology is sometimes pretty good when you're talking about drilling a well and spending half a million dollars or more.

I looked at the gas/oil ratios for those two wells and ultimate production, and I concluded that the Hill View Number 2 would make an ultimate of 375,000 barrels of oil from a net porosity of -- net feet porosity of 56 feet, and this is on Exhibit 16, that would give a barrels of ultimate production for foot of pay of 6,678 barrels, and I found that the beginning and ending gas/oil ratios were in that old well on production for nine years,

pretty much the same, a little over 3,000.

There was some period in the interim when the well was on and off operated by Conoco, I believe, in which gas/oil ratio shot up periodically, but by and large we saw real gas breakthrough and I like that.

Water production was fairly constant starting at slightly under a 1,000 barrels a day, and currently it varies a lot but it still is perhaps averaging somewhere around 1200 barrels a day over a two or three-month period.

Q. Isn't this the same area that Yates' engineer was describing had justified some infield drilling and some reentries?

A. Yes.

Q. It was his conclusion that you could, or he did not see drainage between the two wells this close together?

A. He mentioned drainage between wells in the northeast quarter of Section 23, but he didn't mention drainage elsewhere, but when I analyzed the Hill View Number 2, which is direct south offset of the Number 4, that would be the J location of Section 23, I found the trend, and I used the same method as I used on the Number 4. The trend points

to about 214,000 barrels of ultimate from 52 feet of net porosity, and an ultimate recovery of only 4115 barrels per foot of pay.

And ratio wise this is pretty much the same as Mr. McWhorter calculated. He had lower ultimates than I did, but I was trying to get a handle on a production decline from old production that would give me something as a basis for projecting production declines and ultimate production from these newer wells.

Q. Do these two wells demonstrate any drainage by the Number 2 well from the Hill View Number 4 well?

A. I think it's fairly obvious that the Hill View Number 2 drains some of the area on which the Number 4 is sitting. It will not project as much ultimate yet it only has four feet less pay. The gas/oil ratios are similar, however, the Hill View 4 starts out a little higher. It started out around 7,000. It came down gradually to around a 3,000 average, and water production is similar. So, yes, I concluded that there was drainage going on, and, in fact, with the development and the continuity of porosity between Section 23 and 25, I have often referred to that as a northwest passage because this

area in Section 23 is being drained and drawn down pressure wise by fairly high density of drilling, whereas the Section 25 is sitting there undrilled.

So I believe that there is a question of correlative rights protecting that drainage by offset drilling.

Q. In your opinion, can we first drill the southwest of the southwest of the 25, postpone drilling further wells in Section 25 with the expectation that those reserves will stay in place until you get to them?

A. I would be afraid of that for a couple of reasons. Number 1, as the summary at the bottom of the exhibit 16 shows, the Hill View 2 and Hill View -- I'm sorry. At the top of page Exhibit 16, the Saguaro Number 1 which is the F location in the middle of the Section 26 and the Conoco Number 2 which is the G location, have reached ultimate production. They're there. They are now gas wells.

The F location, Saguaro Number 1, produced an ultimate, or total of 39,000 barrels of oil, while the Conoco 2 produced 24,000 barrels of oil, and this is from a porosity -- total porosity feet -- of 50 feet from the Number 1 and 30 feet from the Number 2, and if you look at your barrels

of ultimate per foot of pay, you're looking at in the 700s versus the 6,000s for the wells up in Section 23, 700 barrels ultimate per foot of pay versus an average between those two wells in Section 23 of 5396 barrels per foot of pay.

And I have used that average for projecting the possible productive ultimate from the McKay oil location in the northwest northwest of 25, also in the northeast northeast of 23 in the new Hill View Number 5 well, and I did it mentally for the Prickly Pear because by the time we got the information I didn't have time to prepare anything on that, but the thickness of pay and everything would indicate it would do about the same and obtained the production of 325,000 barrels, I believe it was, for the -- for the Hill View Number 5 in the northeast northeast using this same method, and about 375,000 for the Prickly Pear, and 386,000 for the McKay well in the northwest northwest.

Now, going back to the two Saguaro wells, or the Saguaro and the Conoco in Section 26, these wells have a lot of feet of porous pay below the minus 4,001 one which we have used as trying to stay below gas production at minus 4,001, but they are in contact -- the rock is in contact with the gas cap,

and it's been proven in this reservoir that we have vertical migration within the reservoir and the onlapping of these rocks that are in the gas cap with the ones in Section 25 that are not subject to gas cap, provides a path for the gas to travel vertically into your produced area, and, of course, this is one of the basic principles of petroleum engineering that once you start this to happen it accelerates rapidly by the rule of relative permeability.

In other words, if your gas saturation increases, your relative permeability to oil decreases, and, of course, while this is going on, the permeability to the gas increases more and, of course, more gas keeps feeding in, and I think that is exactly what happened in Section 26.

Now, the Yates location in the southwest of 25 is half way between roughly these two wells in Section 26, and the Marathon well in Section 36, which they have tested and perforated and tried to make an economical well, or commercial well, in the lower zones, and they have failed to do this.

So here you are proposing a well between a defacto dry hole and two gas wells, and you have the same laser geology in there as far as porosity feet

is concerned. To me it looks risky. I don't see that this would be wise when you have -- when you have a wet place to drill where you're near proximity to known production with good porosity, good permeability, low ratios, normal water production, and all those good things beside the question, of course, of protecting correlative rights.

Now, if you drill the Yates location and that well goes to gas, what do you have? You have a 320 on the west half that's condemned because you have a gas well. You can't drill any more wells up there. So what's going to happen? The wells in 23 are going to continue to drain because you are -- you do have an active -- partially active -- water drive. Not fully but partially active because the ultimate recoveries -- the recovery factors -- are substantially higher than you would expect from just normal solution gas production, which would be in the 15 to 20 range, and we're talking in this area.

We're talking about 25 to 30 percent recovery of original oil in place. And studies done about six miles to the north of Mr. Loogenville indicate that they're getting recovery factors of about forty percent original oil in place, so you do

have considerable water expansion. You do have an aquifer, as everybody has pointed out, you have an aquifer.

That aquifer expands, and as it expands it maintains pressure. You draw down the pressure in Section 23, the oil moves from 25 into 23, and there's a simple differential pressure relationship.

Let me give you an example. We think of water as being incompressable, but if you take a 5,000 foot and you set 5/8ths intermediate casing at 5,000 feet, and you are ordered to pressure test that casing to 3,000 psi. It would take five barrels -- if that casing is full when you start -- it will take five barrels of pumping new water into that casing to take care of compressibility before you reach your 3,000 psi.

Now, you look at that piddling -- let's see, about 300 barrels of water being compressed versus the, you know, the tons of water you have available to -- that is compressed at a bottomhole pressure now of close to 3,000 psi all over this area, and you're going to have this expansion which is going to maintain pressure and push that oil out. So it would be a disaster. It would not pay

the investors, it would not pay Yates, it would not pay McKay, it will not pay the BLM or MMS, or the State. And I would -- You know, you get back to the -- am I rambling too much?

Q. No, sir. But let me ask you now, having concluded that the reserves in Section 25 are at risk because they're going to be drained towards the Section 23 wells unless they're protected, what do you do? Where do you put your well?

A. In the northwest northwest of 25.

Q. Do you have a recommendation as to how to orient the spacing unit?

A. Well, I still like the horizontal primarily because you -- number one, as has been pointed out, you let each company drill their preferred locations. Number two, you remove the risk of what I was just talking about establishing a 320-acre gas proration unit in the prime oil area of this entire section and stopping recovery from this section.

Q. Have you made an engineering evaluation of the oil in place and the recoverable reserves within Section 25?

A. Yes, sir.

Q. Can you summarize for us what you've done?

A. Yes. If you turn to Exhibit 17?

Q. Yes, sir.

A. I divided the Section 25 into four quarters, and using the grid overlay system I measured the area between adjacent contour lines and took the net porosity feet, and by the way, I guess we should be looking at the same time at Exhibit --

Q. 25?

A. Yes, sir. Which is the porosity feet of Upper Penn dolomite below minus 4,001 feet. And I find that the northwest quarter has -- actually has about six and a half acres more than the other quarters because of a little bit of misshapen section here, but it has 479.41 acre feet of porosity, and the original oil in place in stock tank barrels of oil is 1 million five hundred and forty-nine thousand, six hundred and ninety-three barrels. And that comes out to be 3232.5 barrels per acre foot of porosity. And, of course, an acre foot of porosity would be just like an acre foot of water, it would be 7,758 barrels.

The northeast quarter has only 115.32 acres which is within the zero -- within the zero dolomite line, and that gives 126.85 acre feet of porosity for 410,043 barrels of stock tank oil originally in place.

The southwest quarter is very good, 160 acres, 447,35 acre feet of porosity, and oil in place 1 million 446,059, and the southeast quarter 155.57. Again, we lost part of that because the zero line doesn't cover the full quarter. This was 248.91 acre feet of porosity with original oil in place of 804,602 barrels, so regardless of where your tilted water table is, there's a lot of oil here.

Now, I took these figures of original oil in place and then calculated recovery factors. First I used the Hill View Number 2 since that was the first well I looked at, and assuming that that well will ultimately recover 375,000 barrels of oil, which was my projection which I think is valid, you will have a recover factor of 29 percent or .29 decimal percent of original oil in place.

The McKay northwest quarter of Section 25, and I declined that well. I started it at 500 barrels. I figured it should be as good as the well in the northeast quarter of 23 and probably as good as the Prickly Pear, so I started at 500 barrels a day and that pointed to 386,000, and when you use the little formula for the recovery factor down at the bottom of the sheet, you come out with a 25

percent recovery factor.

Now, I did all of this to compare -- not only to see what the recovery factor is because I was interested because I was expecting it if there were not an active water drive, for it to be in the range of 15 to 20 percent, but it is not, it is much higher.

Then the Saguaro Number 1 well recovered only 39,000 barrels of oil, and from the porosity feet that that well exhibited, which was 1.90 porosity feet, I calculated 4 percent oil in place recovered by that well, and the Conoco Number 2, the twin well in Section 26, did worse.

And by the way, the one that did worse, the G location, the Conoco Number 2, is perforated lower than the Number 1 well.

Q. When you look at the division of oil in place within the confines of Section 25 and divide it into the four quarter sections, that's what you've down, you've given us the oil in place for each of those quarter sections?

A. Uh-huh. Well, this is stock tank barrels of oil, shrinkage factors taken into account. I've used a shrinkage factor of 1.56 just for the record.

Q. Let's play some "what if" games with the

orientation of the spacing unit. If we take it and stand them up with the west half, the greatest amount of reserves are allocated to the west half under that configuration?

A. Right.

Q. From your understanding of the geology and engineering for this section, there is reserve value in the east half?

A. Even though we don't know for sure where the water contact is there is some oil there, yes.

Q. And the owners of the oil in the reservoir in the east half may not be able to share in production unless they're lay down spacing units?

A. That's correct.

Q. Because the optimum location in which to produce those reserves is going to be well locations in the west?

A. Right, exactly.

Q. So with a stand up west half the reserves in the east half are going to be enjoyed only by the owners in the west half?

A. That's right.

Q. Summarize for us what these decline curves are? I assume that's what they are from 18 through 24 so that the record indicates what you're saying.

A. Let's look at -- jump around a little. Let's look at 19 first, Exhibit 19. The first page of 19 --

Q. What are these? What are these documents?

A. They are production decline curves for -- this one as shown on the bottom of the graph is for the Hill View AG Number 2.

Q. And you have utilized this information then in your analysis of reservoir including establishing the declines by which you have then calculated recoveries?

A. Yes, that is correct.

Q. Okay.

A. I took the production history portion of the AHE Number 2 from about the beginning of 1983 until what? Middle of 1986 as a fairly good indication of what might be expected. This came out to be a 17 percent decline. I couldn't -- I couldn't argue with this 17 percent. If somebody wanted to call it 19 or 15, but I think it's pretty well establishes what a normal production decline would be after the initial flush production is off for a fairly good well.

Q. And this is a conventional way for engineers to establish a decline for production that

they use then in other calculations?

A. Yes. And since this is an old well, I shifted the 17 percent up to the present production which was initiated after Yates worked the well over and placed it on electric submersible pump.

And by the way, the last two months production, which are not here, are all actually on or above the line that I have projected at 17 percent. So, I feel that it is a valid decline curve.

Now, I took this same method with a little bit of liberty to analyze the production from the AHE Number 4, the Hill View AHE Number 4, which is Exhibit 20. And by the way, the remaining pages of this is just supporting information. I include also the gas.

Q. And you've done that for all 4 of these wells. You used decline curves?

A. Yes, sir.

Q. All right.

A. Exhibit 20, if you'll notice that, I took the initial production when the good production started after a number of months when the wells was placed on submersible, and put this on -- because it was a fairly new well -- I placed it on hyperbolic

curve with the exponent factor of .5 so that you would compensate somewhat for this initial flush falloff, and then leveled it off and let the curve level itself off to 17 percent straight line or exponential decline, and this is one that projected to 200, and Exhibit 16 was 214,000 barrels of oil.

Q. Are you satisfied the entire procedure is one that's reasonable and fair for the standards of your profession?

A. I do because when I applied the same procedure for the Hill Number 5 I got 325,000 to the McKay which is -- McKay location -- which is in the northwest northwest of 25, and the Prickly Pear which we are projecting to be about the same, I gather, around 375 to 386,000 barrels of oil. So I think this is a fair projection with the amount of -- limited amount of data we have for this area with history available.

Q. Thank you, Mr. Sanders.

MR. KELLAHIN: That concludes my examination of Mr. Sanders. We move the introduction of his Exhibit 16 through 25.

MR. CATANACH: Exhibits 16 through 25 will be admitted as evidence.

(McKay Oil Corporation Exhibits 16

through 25 were admitted in evidence.)

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Sanders, you are a consulting engineer working for McKay on this matter?

A. Yes, sir.

Q. When were you retained by Mr. McKay?

A. A week ago last Tuesday. That's why I have circles under my eyes.

Q. Prior to this assignment, how much of your time have you devoted to this particular pool?

A. To this particular pool, zero. I have worked in the general area. I've worked in the Indian Basin, but this particular pool, zero. George Reddy did an excellent job of catching me up and bringing me up to speed.

Q. And that's why he has circles under his eyes?

A. That's why he does.

Q. We look at your Exhibit Number 16. If I understand this exhibit, the top part of it shows the two Conoco wells which offset the proposed Yates location in the southwest of 25; is that right?

A. Right.

Q. And based on this you've concluded that

they are pretty poor wells; is that fair?

A. Yes.

Q. All right. If we go down now and look at the bottom half, you've set out information on the Hill View Number 2 and Hill View 4J well. You have a production decline curve which is your Exhibit 19 on that Hill View Number 2, do you not?

A. Right.

Q. And if I look at this, sometime in '87 the well was -- you've got a 17 percent figure. What does that indicate on that?

A. 17 percent per year. That's an annual decline rate, and it's put on the semi log because it is an exponential type thing.

Q. And does this show what the well was actually doing in say mid-1988 I guess it is?

A. Let me turn to that.

Q. It's Exhibit 19.

A. In mid-1988 you say?

Q. Yes, sir.

A. No, it does not. This is just a projection which would be close to what you would get if you applied all the production figures that you have and used the method of leased squares. I did not use that. I have a program which does this

automatically, so this would be just using the actual production figures kind of averaging there to get that decline. It doesn't mean that you did make oil. In fact, the well was apparently shut down for a couple of years there.

Q. Basically what this shows, though, this is a poor performance for the well?

A. 17 percent decline is not a really poor performance. Of course, the well was probably at or near economic limit as your Mr. McWhorter testified.

Q. Well, are these -- are these just plots of the production -- actual production from the well?

A. Actual production by month, yes.

Q. And then -- so, we have then in 19 -- I guess, '90, production plots begin again. These are both decline curves on oil, are they not?

A. Yes. Well, the solid black is oil, the hollow squares are gas, and the Xs are water. I should have pointed that out.

Q. Okay. So the line that we have that has the 17 percent figure at the end of it running through '82, '87, or '88, that is the oil production decline and production rate during that period of time?

A. Yes, right.

Q. And then we have it jump up in 1990 and another decline take off at that time?

A. Right.

Q. And isn't it true that when the production jumped up to the higher rate in 1990, that's when, in fact, Yates took over this well?

A. That's my understanding, yes.

Q. And so what we have is we have a situation were Conoco had given up on the Hill View Number 2, Yates took it over and was able to make the kind of well out of it you show on the bottom of your Exhibit 16?

A. Yes. By applying good engineering and getting the oil to moving.

Q. If they were taking over the two Conoco wells in 26, would you anticipate with good engineering they might do the same?

A. Those wells are already Yates, I believe.

Q. And is it possible that by applying some engineering techniques they could also take over Conoco wells and get that kind of a response?

A. No, sir. I don't believe so because, as I pointed out, once you get this gas breakthrough you saturate. It's similar to a water block. You can do the same thing with a water block and you can

block production.

Q. Do you know what kind of engineering techniques --

MR. KELLAHIN: Did you complete your answer?

THE WITNESS: Sorry?

MR. KELLAHIN: Did you complete you answer?

MR. CARR: And I'm sorry if I cut you off.

MR. KELLAHIN: Don't step on my answer.

A. I covered that a while ago.

MR. CARR: If I start cutting you off you raise your hand and I'll go into retreat on that.

THE WITNESS: All right.

Q. (By Mr. Carr) Do you know what kind of engineering techniques employed on the Hill View Number 2 well to get that kind of change in response?

A. Yes.

Q. And you believe that would not be available and they could not do that on other wells?

A. No, I do not because the Number 2 well had not been subjected to gas breakthrough. You had some -- intermittedly you had some ratios as high as 5,000 and some lower. I think you're running a little lower than the 3,00 now. So you did not have that gas breakthrough to increase the saturation and

the poor spacing. Of course, that's what happens you get another -- whether it be fluid or gas -- the saturating medium as you increase the percent of that saturating medium, the permeability to that medium increases and to all others the permeability decreases.

Q. When you made your comparison for Exhibit 16 on your Hill View Number 4 well, did you have any information on any kind of production problems that Yates might be having with that well?

A. No, I did not.

Q. Did you have any information on, say, sulphate scaling in the well?

A. No, I did not.

Q. And resulting problems in pumping the well?

A. No. I feel Yates is capable of handling those. I've known Yates for a long time.

Q. Those sorts of problems could effect the production from a well, could they not?

A. Yes.

Q. If you had those in one wellbore and not another, the wellbore without those problems might perform better?

A. That is right. However, I would not expect such a scaling problem. I have never encountered

where such a scaling problem caused a well to jump to 30, 40, 80,000 gas/oil ratio as is the case of the Saguaro Number 1 which is pretty astronomical.

Q. When we look at your Exhibit 17?

A. 17. All right.

Q. This was based on Mr. Reddy's geology?

A. Yes. I asked Mr. Reddy to prepare me a porosity foot map, and as an engineer that's what I'm primarily interested in, and I wanted all of the dolomite porosities below minus 4,001 so that I could get a volumetric which I could get my hands on.

Q. In this calculation have you factored in a water table anywhere?

A. No.

MR. CARR: That's all I have.

EXAMINER CATANACH: I just have one question.

EXAMINATION

BY MR. CATANACH:

Q. Mr. Sanders, based on the reserve calculations for the east half of Section 25, which are over a million stock tank barrels. I'm sorry, original oil in place?

A. Right.

Q. Would the east half -- would a stand up

east half unit justify the drilling of a well on the east half to cover up those reserves?

A. I don't know the answer to that question because as we mentioned a while ago, we have not defined definitely where the oil/water contact is in that area, and I do not consider that the drill stem test in the Coquina Number 1 in the northwest quarter -- let's see, that would be C location in the northwest quarter -- would be enough to say this is water because we have seen other DST, as was pointed out, where water was obtained and later the well was perforated in that same interval for production.

In fact, the Prickly Pear Number 1, the first three hours that that well was swabbed -- now, keep in mind the Coquina well we made a total of 21 barrels of water on that drill stem test, and we had the same initial and ending bottom hole pressure, so, you know, you do have permeability there.

You possibly had a little bit of formation damage from filtrates because your flowing pressure did increase during the test, but getting back to the Prickly Pear well, the first three hours, and this is one and a quarter hour drill stem test -- the first three hours that well was swabbed they

swabbed 43, twice as much water with a skim of oil, that's it.

The next 24 hours they produced 520 barrels with no mention of any oil, and in the next 24 hours they recovered 634 barrels with three percent oil cut.

Now, with a reservoir that is so water dominated, as Yates has proven, you have to get that water moving for a period of time before things level out and you know what you have. Now, a drill stem test will not cut it, and neither would a 24-hour production test, which is what I suspect happened possibly in the case of Marathon down in Section 36.

We're not able to get the details, I wish we were, of what all went on there. We know they perforated the right porous zones, but we don't know what they recovered. So with this kind of information on the Prickly Pear well, I would say we don't know where that water/oil contact is.

I haven't seen any evidence from either geologist actually, or your -- or Yates side -- which would say where that water/oil contact is. So it is entirely possible that you could justify drilling on the east half but only after you had

progressed and proven some of these points as to rock development and water table.

EXAMINER CATANACH: That's all I have. Anything further?

MR. KELLAHIN: No, sir.

EXAMINER CATANACH: The witness may be excused

ROY MCKAY,

the Witness herein, being previously duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A. Roy McKay. I'm an independent oil producer in Roswell, New Mexico.

Q. The name of your company is McKay --

A. Oil Corporation.

Q. -- Oil Corporation. And you're the president of that corporation?

A. Yes.

Q. Summarize for us the level of involvement you have in southeastern New Mexico as an independent oil and gas operator?

A. I operate over 100 wells. I control over 100,000 acres of properties, leases. I've been in

business for 22 years as just a small-time operator.

Q. When we look at your lease hold position in Section 25 in the South Dagger Draw Pool, from your perspective, tell us how you envisioned its development as you've watched the South Dagger Draw being developed?

A. To be real brief, I acquired this lease in the '70s with the ideas of drilling a Morrow well of which -- at that time I was not an operator and got assigned to be the operator by Sun Oil Company, and we drilled a well which had a better zone in the Atoka than it did in the Morrow, and so we have been producing that well since -- since that time.

I have been watching the Dagger Draw develop as well as realizing that we had a Morrow zone, and we still have not produced in what we call the Charolette McKay Fed. Number 1.

About, oh, middle of last year, one of Yates land people called me and wanted to buy one of the holes, or the hole -- actually, they wanted to buy the lease. I thought they were wanting to buy it for a water disposal well, and I thought well, -- I didn't think a whole lot about the idea, but went ahead and discussed and thought, well, I had heard some pretty good prices on water disposal wells and

maybe if they come up and offer some money for it then there may be some advantage to it.

We have been looking at -- a lot of things that I do is I don't have a geologist on staff. I do a lot of McKayology, which is my own thinking of what happens, close in deals, and things of that sort, but I've had geology in college.

By the way, I'm a graduate of New Mexico States University 1967 class. I also happen to have a BBA, bachelor of business administration. I was also a petroleum landman-trained-typed person which took in geology, and I was a pre-engineering student before that. So I'm a jack of all trades as it turns out in this business. So I do a lot of my own geology.

I had done some ideas or thinking about what was taking place down here aside from question mark, what are we going to do with the lease, the Morrow recompletion in it? And I went about getting with my partners, and they basically did not want to do anything.

. So I went about, and it took about a year to buy them all out, and as of right now I think I own 100 percent of the lease of the 440 acres that's here.

Q. How would you like to see this section developed at this time with the information that's been provided to you by your consultants?

A. Well, my whole idea was that we were either going to reenter the Coquina well. As I saw the Dagger Draw coming down through here, I had done my Kayology which indicated that some of these wells in Section 26 is as possibly gassy situation, but as the development of the oil well was coming on through originally, I thought well, these wells may be in the 100, 200 barrel bracket. Question mark, do you drill a new well in the northwest of the northwest, or do you reenter the Coquina?

It was our opinion that possibly the Coquina had not been totally tested to our satisfaction. Negotiations continued with Yates and, of course, by that time a lot of oil companies were discussing deals with us, and it got -- almost got out of hand as to what are we going to do with the situation.

The buy -- this summer -- well, I had also talked last year with George Reddy and found out that he had done work in about '77 for Roger Hanks and knew quite about the area from the old place, and therefore, I knew at some point in time I would

hire him.

So I talked to him in May of this year about, hey, this is going to have to get a little more serious. We're going to have to get some real detailed geology before I start drilling a well, or before I farm out to somebody, which is the case of a lot of people wanting to do.

And the geologic maps, as you have seen, turned out to make my property look a whole lot better than I'd ever even dreamed of. I had not really ever done anything that detailed. The first part of this year Marathon had drilled a well south of us, and it showed up as a PI -- as a gas well about a million a day. So, I started looking at that, and then I looked at the wells in 26, and this was all happening about simultaneous -- about the time Yates comes in and says we want to drill a well in the southwest of the southwest, and my initial reaction why would you want to drill a well in the southwest southwest?

The best I could do with McKayology was draw a straight line across all that and see gas. My initial reaction to this thing was, Hey, we can't have a -- and the proposal was Yates wanted a west half proration unit, and my understanding of the

rules, I've been told, and checked, and everything I can come out with, if you have a gas 320-acre proration unit, you cannot have a simultaneous oil proration in the same proration unit.

Therefore, I said, well, heck, I'm going to get my oil and it's not going to be produced. So we were trying to get these things worked out. Well all of a sudden after the mist of conversations and probably the bulk of what has been presented by Mecca, and timewise I didn't get that detail on all of this, but there was a lot of talk going on between them and us and other companies. And it finally changed from a water disposal well to that they absolutely wanted the lease, and after that what was the terms going to be.

Q. Let's summarize the fact that we could not agree on terms.

A. It all come together and we could not come to terms on anything, and we wanted an absolute northwest northwest location by the time we got through with all our geology.

Q. And they did not?

A. And they did not.

Q. And there was a disagreement about the orientation --

A. Orientation of the spacing unit was basically the whole deal. Many, many calls and never would Yates give me a northwest northwest guarantee that they would drill that well.

Q. Let's document for the record the AFE that you've submitted to Yates so the examiner, if he chooses to approve your application, will have it in the record as a reference point. Have you included it as part of the package of well proposals to Yates? I think it's marked as the package Exhibit 27. There should be some --

A. They should be in there, yes. And also some transmittals letter August 5, 1991 to Mecca at Yates on August -- that happened -- that was an agreement to go ahead and farm out the southeast quarter to them under Yates' terms if they would go ahead and do a south half unit. We then had the proposing of wells in the northwest quarter. That was under letter August 5, 1991, again. That was to Mecca.

Q. That included the AFE, did it not?

A. And that included the AFE. That was from Jim Schultz vice president of land for McKay Oil.

Q. Did you have any disagreement with Yates about the overhead charges that ought to be applied

regardless of which party is selected to operate?

A. No. We did not have any major problems that could not have been resolved or anything like that. The major problem was we did not feel that we were getting a fair shake in the drilling of the well. In fact, it went so far as they wouldn't even allow us to participate.

We said we will participate with you, that was not acceptable and they wanted to farm out, and my conclusion at that point in time was, their whole intention was to drill the southwest of the southwest, and based on every bit of geology that I had done and what everybody else has come up with that I've hired to do this job, that's going to be a gas well.

That gas well would preclude any oil production out of the northwest quarter, and from that viewpoint I'm had. And based on the calculations we come up with there was 1.5 million barrels of oil in place by outside engineer evaluation, and a total of 2.5 billion -- 2.5 million barrels of oil in place on the whole north half, and, again, I have agreed to participate, farm out the south half, do whatever is necessary.

It was my whole intention before I got this

force pooling thing that they came up with -- that we conceivably would do the north half, they could do the south half.

Q. And we've not been able to resolve that?

A. And we've not been able to resolve that.

Q. Let me ask you to identify for me the display and the significance of the color codes for Exhibit 26. What is shown on this?

A. The green dots represent the proposed location by Yates. The yellow indicates producing gas wells. And if you take notice, the northeast quarter and the northwest quarter, both have two wells that are designated now as gas wells.

Q. The Examiner has, under the pooling applications, asked to make an assessment of the penalty factor. Mr. Beck earlier today requested a 200 percent penalty factor for the approval of his application.

A. I can understand that because that is a very risky location.

Q. What is your recommendation to the Examiner for a penalty factor to apply if the Examiner approves your well location and a north half spacing unit?

A. I'd have no problem with 125 percent. I

don't see that there's much risk at all in that well.

MR. KELLAHIN: That concludes my examination of Mr. McKay. We move the introduction of his Exhibits 26 and the correspondence contained in Exhibit 27?

A. I didn't point out, we do own 87 and a half percent of that. So, therefore, they're located to the east. Whether they want to participate or not would be up to them.

EXAMINER CATANACH: Exhibits 26 and 27 will be admitted as evidence.

(McKay Oil Corporation Exhibits 26 and 37 were admitted in evidence.)

EXAMINER CATANACH: Mr. Carr?

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. McKay, you indicated you operated a number of wells in New Mexico. Approximately how many did you say you operated?

A. I think it's probably over 100.

Q. How many of those wells or in the Dagger Draw?

A. None.

Q. This would be --

A. Well, question, we do operate the Morrow there.

Q. But not in the -- the Morrow is not part of the South Dagger Draw Upper Penn?

A. No.

Q. So this would be your first well?

A. Yeah.

Q. You do operate that Morrow well in the --

A. It's actually in the Atoka right now.

Q. And that is the well in the northeast of 25?

A. Yes.

Q. And what acreage is dedicated to that well right now?

A. East half.

Q. So you've got east half dedication. That's a federal lease?

A. Yes.

Q. Is the whole section federal, or is the 80 acres on the extreme west fee land?

A. The southwest of the northwest, and the northwest of the southwest is fee acreage that Yates, I believe, has the lease on.

Q. All right. So what we'd have -- if your proposal is granted and east half dedication in the

Atoka and north half dedication in this Upper Penn?

A. Yeah. I don't see that that would be a problem from the severance of the horizons that exist there. At least not from the BLM's viewpoint.

Q. Now, in terms of operating a well in this area, you would agree with me, wouldn't you, that all the wells produce some water in this Upper Penn?

A. Yes.

Q. What arrangements have you made for the disposal of water from the wells you would operate in the Upper Penn?

A. At this point in time I haven't made any arrangements. I have ideas what I may do. As you know, there is a water disposal well -- maybe you don't know -- in the north half of 24 that I may make a deal on that, or if Yates wants to work something we can work out a fee for them.

Q. But at this time you don't have any plan on the water disposal?

A. I have not totally decided which way I'm going. I don't even know who my partner is going to be for drilling this thing.

Q. Okay. The gas that would be produced would probably be sour gas and there would be some gas produced?

A. Yes.

Q. Have you made any arrangements with anyone concerning the sweetening or processing of this gas?

A. Not totally. We'll probably go with Phillips if we don't make a deal with Yates or make a deal with Newberg.

Q. Okay. And have you satisfied yourself that there's capacity in the Phillips system to take the gas at this time?

A. I have not myself, no.

Q. Okay.

A. I will point out to that particular point there are two locations. You all do not know them but they're in the west half of the west half of the north -- west half of the northwest quarter of 24.

Newberg has staked two more locations and they should be drilling within the next week or two. They're going to have a system that goes up to their wells that are up in Section 6 and Section 5 of 1925, so if I want to sell through them that's just going to be just a matter of who's going to be around that wants to take it.

Q. And have you discussed that with Newberg?

A. Oh, yeah.

Q. Is Newberg one of your partners in the

acreage which is involved in this --

A. They could be but they're not now.

Q. Now, in terms of moving the gas, who's gathering system would you tie into? Have you decided that yet?

A. No. Again, it may be a tie in with Newberg, or else we'll go over to Phillips.

Q. Are those gathering systems high pressure?

A. I really don't know. I haven't investigated that part.

Q. In completing the well, would you anticipate putting a submersible pump in the well?

A. Yeah.

Q. And if you were confronted with a high pressure system you'd also have to put compression on the well, would you not?

A. That would be up to the engineers. I'm sure that's what --

Q. Do you know if cost for compression was considered in the AFE at all, or are we just not that far along in the planning?

A. I haven't gotten that far really from engineering. I mean, that's -- consultants can take care of that.

Q. All right. You've put a gold dot, I think,

over the Coquina well; is that correct?

A. Yes.

Q. Have you made a decision yet on whether or not you're going to go into that?

A. Well, I would already be drilling except the OCD told me not to, so I waited on this hearing to get over with. I had a rig ready to go. We're pretty -- right now I guess what we do is drill the northwest to northwest once we get approval. Right now we're just sitting letting it drain us. I take that back. Yates is doing, I think, doing their thing. I'm sorry. I didn't mean to say that.

Q. When you drill a well and complete it you need to test that well, do you not?

A. I'm sorry, I didn't hear the question.

Q. After drilling the well you test it. That's what is happening on the Prickly Pear I gather?

A. I don't have Carl. Let me back up. I didn't finish up the deal. In terms of gas gathering systems and such, I, at least, need to put this on the record. We do operate over 60 miles of pipeline anyway. It's not something new we can't do ourselves. I mean, it's a matter of economics, okay?

Q. Okay.

A. That takes care of that pipeline part. We are -- we do have that part taken care of if we had to.

Q. How far would you have to lay a line if you were just laying it yourself?

A. I haven't investigated that yet.

Q. Do you have a line in close proximity to these wells?

A. No.

Q. So you'd have to lay and --

A. Yeah, uh-huh.

Q. And so the longer the line the greater the economic consideration would be?

A. Uh-huh.

Q. Okay.

A. It almost makes us have is tie in with Newberg if Yates don't play with us.

Q. Yates is one of the parties you're considering tying in with?

A. If they own part of it -- they're going to own part of it either way we cut it.

Q. How soon do you plan to go forward with the drilling of the well should you prevail? Right away?

A. As soon as they say yes.

Q. And when you're drilling and complete the well, would you have a gathering line present at the time you completed -- before you test the well?

A. I'm not sure of that.

Q. Would you consider flaring the gas at that time while testing?

A. I'm not sure what we'd do at that time.

Q. Your plans just aren't that definite?

A. We don't even know if we're going to get to drill it.

Q. In terms of flaring gas of this nature --

A. I wouldn't think you would want to do that with sulphur gas, you know, but I don't know the whole game down there.

Q. And why is that, air quality problems?

A. I would think that would be a problem.

Q. If that was a problem, wouldn't you want to have a gathering line in there before you actually --

A. You'd have to have before hand. Typically most of the gathering systems in the well I drill, which is mostly in the Abo, I have a pipeline there when I fract the well one way or the other.

Q. And if you don't you can say that. Have

you gotten to the point where you know whether you have a pipeline in here?

A. No, uh-uh.

MR. CARR: That's all I have.

EXAMINER CATANACH: Just one, Mr. McKay.

EXAMINATION

BY MR. CATANACH:

Q. If your application is approved, are you going to reenter that Coquina well, or are you going to drill a new well?

A. After looking this over, I think I probably would go ahead and drill a new well first, and I say that because the data that I saw on the current production of the offset well, I almost have to get on with it, you know.

EXAMINER CATANACH: Mr. Kellahin, did we get those overhead rates in?

MR. KELLAHIN: I thought there were --

THE WITNESS: There were 5400 drilling in 540 monthly. That's what's Yates, and there's no problem with that.

EXAMINER CATANACH: That's all I have.

MR. STOVALL: Don't run away Mr. McKay. I want to look at something if Mr. Kellahin can find it.

EXAMINER CATANACH: The witness may be excused. Brief closing statements, gentlemen?

MR. KELLAHIN: Well, one cleanup matter. I have neglected to bring my certificate on the notice. With Mr. Carr's permission I'd like to submit it posthearing.

EXAMINER CATANACH: Absolutely.

MR. STOVALL: Is there a notice probable?

MR. CARR: I'll waive notice. We're here and we'll stipulate we have no reason that we certainly don't -- would not assert that probably --

MR. KELLAHIN: There's no notice asserted either side. I'm happy to waive closing, Mr. Examiner. I would like to take the opportunity to submit a proposed order for you to consider as part of our presentation. I think the issues are obvious and what you're asked to do is apparent, and I don't know that I can add anything to the discussion by giving a layman's point of view of the technical data that you need to decide.

EXAMINER CATANACH: I appreciate it.

MR. CARR: Well, you're not going to appreciate me. I'm not going waive closing. If Tom would like to have a closing knowing that I'm going to?

MR. KELLAHIN: I've listened to you before.

MR. CARR: Mr. Catanach, after more than a year of attempting to reach agreement with other owners in this section for the development of this particular Upper Penn Pool, we had to come to you and seek an order force pooling the lands. So we filed our application.

At the request of Mr. McKay we continued it to this day when we could all come before you. A lot of things, as Mr. Kellahin pointed out in his opening statement, are not at issue, but the critical issues are lay down versus standup units, and we believe on this record the evidence is very clear, as Mr. Reddy pointed out, the west half is where the productive acreage is, and we submit to you that and that alone should dictate which particular application you ought to approve.

Mr. Kellahin, on the other side has come in and said, yes, that there are reserves over in the east half of the section. Our data shows that the east half of the section is wet, and that there are not reserves there that could be produced.

You see, the problem we have here today is we seem to be talking different pools. Yates is operating 80 wells in the pool, going out there with

Mr. Beck and Mr. McWhorter drilling and developing the reservoir have concluded that we have what we call big water in that reservoir, and that you have to be above it.

Even if you've got the dolomite if you're not above the water you don't have a well, and yet when we go to the engineering information presented and the geological information presented by McKay, that perhaps one of the very most critical correct facts from a reservoir point of view is simply forgotten. It's simply overlooked. We have reserve calculations. They don't take into account the water. We have geology which ignores the water, and to deal with the water to the extent that they did. They did some log calculations.

On the other hand, Mr. Beck has worked with drill stem test information, perforation information, mud logs. In fact, we come to you and stand before you with better data and substantially more experience. We find water there and we think that's a controlling thing that must be considered. When we do that we have a better location.

We have a 154 feet above the water in the dolomite. The McKay location has only 80 feet. So we submit we stand in a better position there.

And as to drainage, I would submit when you look at this record you will see that the experience in the northeast quarter of 23 is correct, it is controlling, and it shows that we are not in a situation where we're going to be draining the reserves from Mr. McKay. That's nothing more than just waving a bloody shirt in front of you to try to deflect it from, I think, the real issue in this case.

We think we stand before you entitled to a pooling order pooling the west half. We are entitled to it because of our experience, because of the 80 wells we operate, because we have facilities in place and a plan and ability today to handle the water, to gather the production, to process it and to operate this as a first rate operation.

We filed first, we were the moving force in developing the area. It was, as Mr. McKay said, it was only after we started looking at it that they started looking at it. We think a standup unit is consistent with the geology. It's consistent with how this pool is developed throughout the area, if you will look.

And for all of these reasons we submit that you can carry out your duty to prevent waste,

protect correlative rights only by granting the application of Yates Petroleum Corporation and denying the application of Mr. McKay.

EXAMINER CATANACH: Mr. Carr, did you also want to submit a rough order?

MR. CARR: I do get to do that. This is not take turns. We will submit a proposed order, Mr. Catanach.

EXAMINER CATANACH: Is there anything further in these cases? There being nothing further, Case 10363 and 10386 will be taken under advisement, and this hearing is adjourned.

(The foregoing cases were concluded at the approximate hour of 5:55 p.m.)

I do hereby certify that the foregoing is a complete record of the proceedings in 10363 the Examiner hearing of Case No. 10386, heard by me on September 19 1991.

David R. Catanach, Examiner
Oil Conservation Division

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

REPORTER'S CERTIFICATE

BE IT KNOWN that the foregoing transcript of the proceedings were taken by me, that I was then and there a Certified Shorthand Reporter and Notary Public in and for the County of Bernalillo, State of New Mexico, and by virtue thereof, authorized to administer an oath; that the witness before testifying was duly sworn to testify to the whole truth and nothing but the truth; that the questions propounded by counsel and the answers of the witness thereto were taken down by me, and that the foregoing pages of typewritten matter contain a true and accurate transcript as requested by counsel of the proceedings and testimony had and adduced upon the taking of said deposition, all to the best of my skill and ability.

I FURTHER CERTIFY that I am not related to nor employed by any of the parties hereto, and have no interest in the outcome hereof.

DATED at Bernalillo, New Mexico, this day November 12, 1991.

My commission expires
April 24, 1994

LINDA BUMKENS
CCR No. 3008
Notary Public