STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:	)	CASE NO. 11,161
APPLICATION OF YATES PETROLEUM CORPORATION	)	

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

December 15th, 1994

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on Thursday, December 15th, 1994, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, before Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

December 15th, 1994
Examiner Hearing
CASE NO. 11,161

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E X H I B I T S

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* * *

A P P E A R A N C E S

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By: WILLIAM F. CARR

* * *

WHEREUPON, the following proceedings were had at 10:25 a.m.:

EXAMINER STOGNER: At this time I'll call next case, Number 11,161.

MR. CARROLL: Application of Yates Petroleum Corporation for a pressure maintenance project, Eddy County, New Mexico.

EXAMINER STOGNER: At this time I'll call for appearances.

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

I represent Yates Petroleum Corporation in this case, and I have three witnesses.

EXAMINER STOGNER: Any other appearances?

Will the witnesses please stand to be sworn?

(Thereupon, the witnesses were sworn.)

MR. CARR: Mr. Examiner, following the filing of this Application we have also filed an application for certification of this project for the recovered oil tax rate under the New Mexico Enhanced Oil Recovery Act. That case has been docketed for hearing on January the 5th.

We would request permission, however, to present the testimony that relates to that application here today, and at the end of the hearing we will ask that the case be

continued to January 5th, and if there's no objection at that time, that it be taken under advisement on the record made here today.

EXAMINER STOGNER: Thank you, Mr. Carr. I believe another case has been advertised for Yates Petroleum Corporation for tax -- pursuant to the tax act, as a whole other case, but we're prepared to hear testimony on that particular other case today, and this particular record will be made a part of the other case on January 5th.

MR. CARR: Thank you.

EXAMINER STOGNER: You may continue.

ROBERT BULLOCK,

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

DIRECT EXAMINATION

BY MR. CARR:

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

A. My name is Robert Bullock.

Q. Where do you reside?

A. Artesia, New Mexico.

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

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

Q. Have you previously testified before this

Division?

A. Yes sir.

Q. At the time of that testimony, were your qualifications as a petroleum landman accepted and made a matter of record?

A. Yes, sir.

Q. Are you familiar with the Application filed for Yates Petroleum Corporation in each of these cases?

A. Yes, sir.

Q. Are you familiar with the status of the lands in the area of your proposed pressure maintenance project?

A. Yes, sir, I am.

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

EXAMINER STOGNER: They are.

Q. (By Mr. Carr) Mr. Bullock, would you briefly state what Yates seeks with this Application?

A. Yates Petroleum Corporation is seeking a pressure maintenance project, authority to institute a cooperative pressure maintenance project on portions of its leases in Sections 14 and 23 of Township 20 South, Range 24 East, into the South Dagger Draw-Upper Penn Associated Pool.

Q. Will this be a pilot project?

A. Yes, sir.

Q. Is Yates also seeking qualification of the

project for the recovered oil tax rate under the New Mexico Enhanced Oil Recovery Act?

A. Yes, they are.

Q. Let's first go to what has been marked for identification as Exhibit Number 1. Could you just identify that, please?

A. Exhibit Number 1 is the plat showing Yates-operated leases.

Q. Is it -- Let me back up. Exhibit Number 1 is the C-108 that has been filed in this case; is that not correct?

A. That's correct.

Q. And that's going to be reviewed by the engineering witnesses?

A. That is correct.

Q. All right. Let's go now to Exhibit Number 2. Can you identify that, please?

A. Exhibit Number 2 is our land plat showing the Yates-operated leases, indicated in Township 20 South, Range 24 East.

We've colored the leases in yellow, the leases that Yates operates.

We've also tried to indicate the proration units as outlined by the red colors.

Q. The pilot project is located in portions of

Sections 14 and 23; is that right?

A. That's correct.

Q. Is that better shown on Exhibit Number 3?

A. Yes, sir, Exhibit Number 3 has highlighted the outline of the pressure maintenance project in green.

The project is located in portions of Sections 14 and 23.

It indicates the injector wells and the production wells will be affected by this project.

Q. Are all lands within the proposed pilot project federal lands?

A. Yes, sir.

Q. And at this time is Yates Petroleum Corporation working with the Bureau of Land Management on the formation of whatever unit may be required to go forward with this pilot project?

A. Yes, they are.

Q. Will Yates advise the OCD once this issue is resolved with the Bureau of Land Management?

A. Yes, we will keep in contact.

Q. Is Exhibit Number 4 an affidavit confirming that notice of today's hearing has been provided as required by Oil Conservation Division rules?

A. Yes, sir.

Q. And has notice been provided to all leasehold

operators within one half mile of any of the injection wells in the proposed pilot project?

A. Yes.

Q. And has the owner of the surface of the land also been notified?

A. Yes, sir.

Q. That's the Bureau of Land Management; is that right?

A. Them and also Carl Foster, I believe, is the surface owner there.

Q. Will Yates call engineering and geological witnesses to review the technical portions of this case?

A. Yes, sir.

Q. Were Exhibits 2, 3 and 4 either prepared by you or compiled at your direction?

A. Yes, sir.

Q. Can you testify as to the accuracy of these exhibits?

A. Yes.

MR. CARR: At this time, Mr. Stogner, we move the admission of Yates Exhibits 2, 3 and 4.

EXAMINER STOGNER: Exhibits 2, 3 and 4 will be admitted into evidence at this time.

MR. CARR: And that concludes my direct examination of Mr. Bullock.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Bullock, on Exhibit Number 3 is this the area -- as -- You said it was in green.

MR. CARR: It may not have copied that way, Mr. Stogner, but it's --

Q. (By Examiner Stogner) No, it didn't copy that way, but it's the outline --

A. Yes, sir, the outline.

Q. -- of the area, as described in the ad?

A. Yes.

Q. That is the proposed unit that you have approached the BLM?

A. That's correct, yes.

Q. And has there been any preliminary approval on that yet, or the State just --

A. Mr. McWhorter with our engineering department has made those contacts, and he can talk better about that than myself.

Q. Okay. Has there been a name attached to that proposed unit at this point?

A. He can also answer that question.

Q. Now, each one of those leases or portions of this property making up the area, that's all 100-percent Yates property?

A. No, Yates owns 100 percent of the working interest in Section 23. And in the portion of the project area located in Section 14 Yates owns 37 1/2 percent and Santa Fe Energy Operating Partners owns 62 1/2 percent.

Q. And what is the status of Santa Fe Energy's portion?

A. Mr. McWhorter has handled all the contracts out of the engineering contract, and he can speak to that matter.

EXAMINER STOGNER: Okay. Well, with that, I have no other questions of the landman. I'll reserve those questions later.

MR. CARR: All right. At this time we will call Mr. Brent May.

BRENT MAY,

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

DIRECT EXAMINATION

BY MR. CARR:

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

A. Brent May.

Q. Where do you reside?

A. Artesia, New Mexico.

Q. By whom are you employed?

A. Yates Petroleum.

Q. And what is your current position with Yates?
A. As a geologist.
Q. Have you previously testified before this Division?
A. Yes, I have.
Q. At the time of that testimony were your credentials as a petroleum geologist accepted and made a matter of record?
A. Yes, they were.
Q. Are you familiar with the Application filed in this case on behalf of Yates Petroleum Corporation?
A. I am.
Q. Are you familiar with the geology in the project area?
A. Yes, I am.
MR. CARR: Are the witness's qualifications acceptable?
EXAMINER STOGNER: They are.
Q. (By Mr. Carr) Mr. May, you've prepared certain exhibits for presentation here today?
A. Yes, I did.
Q. Before we go on to those exhibits, could you provide Mr. Stogner with a general description of the geology in the Upper Pennsylvanian formation in this area?
A. Basically, the South Dagger Draw-Upper Penn Pool

produces from a prolific dolomite reservoir. The reservoir is comprised of a dolomite facies with a bank-type deposit. This dolomite facies can have excellent porosity and permeability and will produce large volumes of fluid, be it oil, gas and/or water.

There's also a limestone facies associated with this dolomite. It is tight and serves generally as the lateral and top seals for this reservoir.

As stated before, Yates is proposing a pilot waterflood project for Sections 14 and 23 of 20 South, 24 East, within this pool.

Q. Let's go to what has been marked as Yates Petroleum Corporation Exhibit Number 5. Would you identify that and then review it for Mr. Stogner?

A. This is a stratigraphic cross-section, A-A'. It's an east-west cross-section. It's a dip orientation across the pool.

You might note that the location map is in the lower right-hand corner.

There are five wells on this cross-section. The center well, the Yates Petroleum Hill View "AHE" Federal Com Number 6, is a proposed injector, with the two wells on either side of it, the Hill View Number 5 and the Saguaro "AGS" Federal Com Number 9, being producers within the proposed project area.

Perforations, initial potentials and cumulative production is listed below each well, and perforations are also graphically placed on each log.

The datum for this cross-section is this base of a shale marker just above the Canyon formation, which is also -- This pool is called Upper Penn by the State, but Yates generally identifies it as a Canyon.

The top of the Canyon lime is marked, and the Canyon dolomite reservoir is colored in blue.

There have been several zones within the Dolomite that have been correlated. The correlations can be carried locally for the most part.

Regionally, it is difficult to carry some of these correlations, and even -- You might note on the cross-sections, I do have some dashed lines and some question marks. So it's not real easy to carry some of these correlations even locally.

And we also might note on this cross-section with some of these correlations, some of these zones go from productive dolomite into tight limestone.

Q. All right. Let's now go to your north-south cross-section, Exhibit Number 6.

A. This is a stratigraphic cross-section, B-B'. It's a north-south section. It's a strike orientation through the pool. Again, the location map is in the lower

right-hand corner.

Proposed injectors are the three wells from the right -- Excuse me, the four wells from the right, and the first one is the Hill View "AHE" Federal Com Number 6, and the next one is the Hill View "AHE" Federal Com Number 2, and then the Hill View Number 4, proposed injectors.

The Hill View Number 17 on the far right side of that cross-section is a proposed producer within the project area, and the Saguaro Number 8 is also a proposed producer.

Again, the perforations, initial potentials and cumulative production is listed at the bottom of each well, and the perforations are shown graphically.

Also, the same data -- It's hung on the same datum as the last cross-section, the base of the shale just above the Canyon formation, and again the Canyon lime is shown along with the dolomite in blue.

Again, the same zones that were correlated on the first cross-section are correlated on this.

It appears that these zones can be correlated locally a little bit better along the strike line versus the cross-section along the dip line. But again, regional correlations can be very difficult.

Q. Have you prepared a structure map of the subject area?

A. Yes, I have.

Q. Is that marked as Yates Exhibit Number 7?

A. Yes, it is.

Q. Would you review that for the Examiner?

A. This is a structure map with the top of the Canyon Dolomite as a datum. The contour interval is 50 feet. The colors denote 100-foot contour intervals.

The blue circles around some of the wells on this map are the wells involved in the proposed pilot project.

And basically this map shows a regional dip to the east and a localized nose within the project area.

Q. Let's now go to your net isopach map, Exhibit 8, and I'd ask you to review that for Mr. Stogner.

A. This is basically a net dolomite thickness map. Again, the contour intervals are 50 feet, and again the colors denote 100-foot intervals.

The yellow circles, this time, locate the wells involved in the pilot project.

And this map basically shows just a dolomite thick, oriented north-south on the east side of the project area.

Q. What conclusions have you been able to reach from your geologic study of this area?

A. Basically -- and I tried to show that mostly with the cross-sections -- is that stratigraphic correlations

through this reservoir can be difficult, and because of this, that's why we're asking for a pilot project. We're not sure exactly how this thing is going to turn out.

Q. Mr. May, were Exhibits 5, 6, 7 and 8 prepared by you?

A. Yes, they were.

MR. CARR: At this time, Mr. Stogner, we would move the admission of Yates Petroleum Corporation Exhibits 5 through 8.

EXAMINER STOGNER: Exhibits 5 through 8 will be admitted into evidence at this time.

MR. CARR: And that concludes my direct examination of Mr. May.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. May, on your cross-section, Number 6, your proposed injection wells, being the Number 8, 6 and 2, those are the proposed injection wells, right?

A. Yes, sir.

Q. Okay. The perforations shown, will those be the injection perforations also?

A. That's what I understand, yes. We are not going to add any new perforations, and we are going to inject into the existing ones.

And the engineer coming up, if there's any

additional information, will speak about that.

Q. Okay. Now, you seem to have this correlated pretty good from the north to the south -- well, except when you get down to the bottom; is that correct?

A. That is correct. It did correlate much better along the strike line versus the dip line through the field, and some of these localized correlations did carry much better through this Exhibit Number 6.

EXAMINER STOGNER: I have no other questions of this witness at this time. He may be --

MR. CARR: He will be present, he will be present if you need to direct questions to him after Mr. McWhorter.

And at this time we call Pinson McWhorter.

PINSON McWHORTER,

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

DIRECT EXAMINATION

BY MR. CARR:

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

A. Pinson McWhorter.

Q. Where do you reside?

A. Artesia, New Mexico.

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

A. Yates Petroleum Corporation, as a reservoir engineer.

Q. Have you previously testified before this Division?

A. Yes, I have.

Q. At the time of that testimony, were your credentials as a reservoir engineer accepted and made a matter of record?

A. Yes, they were.

Q. Mr. McWhorter, you are the engineer who is responsible for this project for Yates Petroleum Corporation; is that right?

A. Yes, that's correct.

Q. And you're familiar with the Application filed on behalf of Yates in this case?

A. Yes, I am.

Q. And you have made a study of the portion of the South Dagger Draw-Upper Pennsylvanian Associated Pool which is the subject of this hearing?

A. Yes, I have.

Q. Have you prepared exhibits for presentation here today?

A. Yes.

MR. CARR: Are Mr. McWhorter's qualifications acceptable?

EXAMINER STOGNER: They are.

Q. (By Mr. Carr) Initially, could you just explain

what type of secondary recovery project Yates is proposing? And in doing this, Mr. McWhorter, you might explain the reasons behind this particular Application.

A. Okay. We're proposing to implement secondary recovery through waterflooding, and we're going to take a pilot area to begin with, and that pilot area essentially is a small component, a small segment, a small slice out of a line-drive system.

The reason -- One of the reasons that we selected this sort of system or pattern is because we had done some numerical modeling simulation of various fivespot and line-drive patterns, and at this particular time we thought that we saw our best recoveries under a line-drive system, so we decided to select a segment of the south pool that would be amenable to a line drive.

And so we looked at this area and we saw that even though there is a gas cap in this pool, there's an associated pool, the gas cap lies mainly to the west, and we could see no real effect of any gas cap drive to the primary production.

Nor could we specifically see any effects of water drive, and that's been most evidenced by a rapid decline in our production of all fluids, oil, gas and water, and the fact that we have rather low reservoir pressures now, in the net range of 500 to 600 pounds.

So that's why we determined that it was -- given the nature of the reservoir and the fact that we calculated substantial oil in place, and we calculated that on primary we were recovering somewhere around 16, 17 percent of that oil, that there was substantial oil in place that probably could be recovered with a secondary recovery project, waterflooding.

Q. Mr. McWhorter, Yates Petroleum Corporation Exhibit Number 1 is a copy of the Application filed by Yates for approval of this project on Division Form C-108; is that correct?

A. That is correct.

Q. And you are the individual who is responsible for preparing this Application and compiling the information attached to the form?

A. That is correct.

Q. Before we go into that, I'd like you to go to what was previously introduced by Mr. Bullock as Yates Exhibit Number 3 --

A. Yes.

Q. -- and review for Mr. Stogner again the project area, the status of the leases in the area, and the ownership, particularly in the tracts in which Santa Fe has an ownership.

A. Okay, the -- what -- On my copy, and I guess on

your copy, if it's like mine, is green, it's the project outline. These are all federal leases in this area, in this project area.

At this time we do not have a unit agreement. We are still in the process of negotiating with the BLM about the necessity of forming a unit versus a cooperative type of agreement.

We had established a cooperative agreement with our other working interest partner, Santa Fe Energy, which has working interests in the south half of 14, and we had established an agreement with them, and we had sent a letter agreement to them, which they now have a copy of, the letter agreement, and they're considering that, where we would do a cooperative type of pilot waterflood.

Q. And the reason is, it's a pilot project?

A. That's exactly right, it's a pilot project.

Q. And you're attempting to just determine whether or not pressure maintenance can be maintained by waterflooding in this reservoir?

A. Right, whether the process is feasible.

Q. Okay. What is the ownership of Santa Fe in the project area?

A. Okay, in the -- In that south half of 14, as Mr. Bullock testified, they have about 62 1/2 percent.

If we were to try to unitize or pool all of the

interests in there, they would probably have somewhere in the neighborhood of between 22 and 25 percent, depending on what you used as equity parameters.

Q. Now, staying with Exhibit Number 3, what is the present status of the three wells that you propose to convert to injection?

A. The Saguaro 8, the Hill View 6 and the Hill View 2 are currently producing oil wells in the pool.

Q. Let's go to Exhibit Number 1 now, and I would direct your attention to what has been marked pages 9 through 11 of this exhibit. Could you identify what's contained on those pages and review the information for Mr. Stogner?

A. Yes, pages 9 through 11 are plats that indicate for each of the proposed injection wells, the Hill View 2, the Hill View 6 and the Saguaro 8 -- this plat shows the location of each respective injection well, proposed injection well, it shows all wells within a two-mile radius of those injection wells, and that radius is drawn on each of the plats. It shows the lease ownership in the area on each plat, and it shows the area of review, the one-half-mile-radius circle of each injection well.

Q. On pages 12 through 15 of Exhibit 1, have you set forth all the data on the wells within each area of review which is required by OCD Form C-108?

A. Yes, I have. On pages 12 through 15 I have tabulated all of the information such as well type, construction, the date the well was drilled, the location of the well, the depth of the well, the record of completion, all of the items that are required by the OCD Form C-108.

Q. Are there plugged and abandoned wells within any of the areas of review?

A. Yes, there are. There's one plugged and abandoned well in Unit K of Section 23.

Q. Does this well actually penetrate the injection zone?

A. No, it does not. This well was TD'd at 5500 feet, and the injection process will take place in the 7600-to-7800 range.

Q. So there are no plugged and abandoned wells which penetrate the injection zone?

A. No, there are not.

Q. And on page 16 of Exhibit Number 1, you have included a schematic of the one plugged and abandoned well in the area?

A. Yes, I have.

Q. But it doesn't reach the injection interval?

A. No, it does not.

Q. Let's go to pages 6 through 8 of Exhibit 1.

Could you tell us what's shown on those pages?

A. Okay, for pages 6 through 8 I've attached schematics, wellbore schematics, of the Hill View 2, the Hill View 6 and the Saguaro 8, the three proposed injection wells.

On those schematics I've indicated the proposed wellbore, downhole equipment for injection, the inclusion of the packer and the 3 1/2 -- we're going to use 3-1/2-inch plastic-coated tubing.

It shows the perforations that we plan to inject into in each well. It shows the casing and cement tops for each casing string in each well.

Q. Do you intend to inject in the existing perforations in each of these wells?

A. We intend to begin the injection process in the existing perforations.

Q. Now, you're going to be injecting into the Canyon formation?

A. Into the Canyon formation, that's correct.

Q. And what is the source of the water you propose to inject in each of these wells?

A. We will use produced water from the South Dagger Draw-Upper Pennsylvanian Associated Pool, the Canyon formation.

Q. So Canyon water back into the Canyon formation?

A. Canyon back into the Canyon. There shouldn't be any compatibility problems.

Q. What volumes are you proposing to inject?

A. We're proposing to inject, on average, about -- from the -- into the three injection wells, an average of about 12,000 barrels a day. That's about 4000 barrels per day, per well. That's on average.

However, at the beginning of the process I thought that these wells will take water by gravity on a vacuum, as the jargon says, and we think that the maximum rate will be in the 15,000 barrels, for the total of the three, which would be about 5000 barrels per well per day.

Q. And this would be a closed system?

A. This would be a closed system.

Q. Initially, you're going to be injecting by gravity?

A. Yes, we know that that is in fact what is -- because that's been our history some in some wells in the Canyon in another part of Dagger Draw.

Q. Do you anticipate having to inject under pressure later in the life of the project?

A. Eventually, we will, and we suspect probably within a year's time or so, we will start to see back pressure and have to have surface operating pressure.

Q. What is the average pressure you anticipate

using?

A. 1000 pounds.

Q. And do you have a maximum pressure you're anticipating?

A. I think the maximum that we'll achieve during this project will be about 1600 pounds of surface operating pressure.

Q. That figure exceeds .2 pound per foot of depth to the top of the injection interval, does it not?

A. Yes, it does.

Q. And before you would increase pressure above that .2-pound-per-foot-of-depth figure, Yates, would be willing and would propose that step-rate tests be run to assure that the confining strata is not separated by the higher pressure?

A. That's correct, we would.

Q. Are there freshwater zones in the area?

A. Yes, there are.

Q. And what are they?

A. The two freshwater zones in this area are, number one, the Artesia group, what's locally referred to as the Artesia group, and below that is the San Andres.

Q. What are the approximate depths?

A. The approximate depth of the Artesia group is really from about -- above 600 feet below the surface,

anything above 600 feet. San Andres freshwater depths run from 600 feet below the surface to 900 feet below the surface.

Q. Are there any freshwater wells within a mile of any of the proposed injection wells?

A. Yes, there's one. There's the Foster Ranch water well, which is in Section 22, and it's in Unit J of Section 22.

Q. And from what interval is it producing?

A. It's producing from the San Andres formation, between 575 feet and 622 feet.

Q. And is there a water analysis of water taken from this well included in Exhibit Number 1?

A. Yes, there is, on page 17, it's included. It shows fairly fresh water.

Q. Now, Mr. McWhorter, you've reviewed the available geologic and engineering data on the area, have you not?

A. Yes, I have.

Q. As a result of this review, have you discovered any evidence of open faults or other hydrologic connections between the injection interval and any other ground source of drinking water or fresh water?

A. No, I have not.

Q. Yates Petroleum Corporation is also seeking authority to qualify this project for the recovered tax

rate under the Enhanced Oil Recovery Act?

A. Yes.

Q. In your opinion, will approval of this project result in the increased ultimate recovery of oil from the project area?

A. Yes, it will.

Q. In your opinion, has the area been so depleted that it is prudent at this time to implement pressure maintenance by waterflooding to maximize recovery of crude oil from this area?

A. Yes.

Q. How soon would Yates anticipate commencement of water injection?

A. We anticipate to commence water injection about March of 1995.

Q. Let's go to what's been marked as Yates Exhibit Number 9.

A. Yes.

Q. And using this exhibit, could you review for the Examiner what the estimated additional capital costs are that you anticipate you would incur with the project?

A. Additional capital costs associated with this pressure maintenance project would be for facilities, which is waterflood, plant and lines and rearrangement of

batteries. That would be $460,000.

The well work, i.e., the conversion work to be done on the three wells, would total $142,000, which would give a project total investment cost of $602,000.

Q. So that's the total project cost?

A. Yes, that's correct.

Q. What is the estimated total value of the additional production that can be recovered from this project if it is successful?

A. The incremental secondary oil, that oil that would be the result of the waterflood displacement process, I estimate as being 395,000 barrels for the pattern area. That would be recovered over about an eight-year period of time.

At an oil price of $16 a barrel, holding that flat, for that oil, would result in gross revenues, gross revenues, of about $6.3 million.

Q. If this project is successful, does Yates have plans to expand the project area?

A. Yes.

Q. Let's go to Yates Exhibit Number 11, and using that graph, would you review the production history of the pilot project area?

A. Yes. This graph shows the oil production history, the gas production history and the water

production history. The oil is in green, the gas is in red, and the water is in blue.

It shows the initial drilling that took place in the 1990s in this -- 1991 in this particular area. And then it shows the rather radical decline that at least the oil production has taken as a result of the primary production.

And it shows that we had hit a maximum of 80-some-odd-thousand barrels of oil production a month in late 1991, and now we're down to the same area, looking at 11,000 barrels of oil per month in a very short period of time, and we're looking at about a 45-percent exponential decline right now, at a current rate of about 346 barrels of oil per day and about 2.7 million in gas per day. And it shows the need -- that we are in late primary and the need for the secondary recovery process to be initiated.

Now, the response part of this curve is an estimate, it's an engineering estimate of what the response of the pattern area should be. And we see that there will be, oh, probably somewhere in the neighborhood of a 10- to 11-month response time from the time that we initiate the injection process.

However, the injection process, as I said, probably won't be initiated until March of 1995. So it's almost the end of 1995 before we'll really begin to see a

waterflood response. We think that the waterflood response will probably peak out somewhere a little over 500 barrels of oil a day.

Q. It is your engineering opinion, however, is it not, that implementation of a waterflood pilot project in this area will increase the amount of crude oil ultimately recovered from the project area?

A. That's correct.

Q. Is it your opinion that it is prudent to implement the pressure maintenance project at this time?

A. Yes.

Q. And the project is both technically and economically feasible?

A. It is.

Q. Is Yates Exhibit Number 12 a copy of the Application for certification of this project that has been filed with the Division?

A. Yes, it is.

Q. In your opinion, will approval of this Application be in the best interests of conservation, the prevention of waste and the protection of correlative rights?

A. Yes.

Q. Mr. McWhorter, were Yates Exhibits 1, 9, 11 and 12 prepared by you?

A. Yes, they were.

MR. CARR: At this time, Mr. Stogner, I move the admission of Yates Exhibits 1, 9, 11 and 12.

EXAMINER STOGNER: Exhibits 1, 9, 11 and 12 will be admitted into evidence at this time.

MR. CARR: And that concludes my direct examination of Mr. McWhorter.

EXAMINER STOGNER: I guess there was an elimination of Exhibit 10?

MR. CARR: Exhibit 10 has been eliminated, because I misnumbered. I have no secret exhibit.

EXAMINATION

BY EXAMINER STOGNER:

Q. Back to the Exhibit Number 9 and 11, I wanted to make sure I got my figures right.

The cumulative oil up to date is that 1,810,829 figure? That's cumulative oil production.

A. From all the wells in the pattern area, that's right.

Q. Okay, and --

A. That's correct.

Q. -- also cumulative gas?

A. Yes.

Q. And your ultimate additional oil to be produced through this mechanism is how much, do you estimate?

A. Okay, the additional oil that I calculate to be recovered from the pattern elements of the producing wells -- You know, what I'm saying is, for instance, Senita Number 2 or the Saguaro Number 9, they have a half a well in that pattern element, and I calculate that the additional, the incremental waterflood oil to be recovered in the pattern area is 395,000 barrels, almost 400,000 barrels.

Q. And that's ultimate additional recovery?

A. From the waterflood displacement process.

There is still more remaining primary to be recovered also. The 395,000 barrels is just the incremental oil that would be recovered from the waterflooding process.

Q. Do you have a figure for the additional primary yet to be recovered?

A. Yes, I do. And bear with me for a moment while I explain. I have two different numbers here --

Q. Okay.

A. -- and they're not different, they're just allocated.

The remaining primary for all the wells in the pattern elements is 281,000 barrels.

If you add that to the 1,800,000-some-odd barrels, it comes out to be just a little bit, ultimate

primary, a little over 2 million barrels.

Q. Okay.

A. Now, there's a second way of looking at this, if you want to -- You know, if I'm trying to look at how much percentagewise I'm recovering, secondary oil versus primary oil, or calculating secondary-to-primary ratio, for a small area like this where we're only -- really only flooding like a quarter of a well in the corners of the pilot, and half on the sides, then the cumulative, when it's allocated out for each well's component in the pattern element is about a million barrels. Remaining primary would be 155,000, and the ultimate primary would be 1.2 million.

That's about a primary recovery factor of 16 percent, and that's because I calculated that 7.7-million-barrel original oil in place in the pattern element itself, not outside, not west or north of the pattern wells, because those would not be contacted by the water, and my real interest in this is how much oil would be recovered by the water contact process itself.

The confusion factor may be in that the actual project boundaries extend a little bit beyond the actual area of the -- what would technically be called the pattern element, which would be a line that would go through the production wells themselves, an imaginary line.

Q. But in this case, you stuck to the quarter

quarter section political line?

A. That's correct.

Q. Now, let me make sure I get this straight. All the water to be injected is going to be reinjected Canyon water?

A. That's correct.

Q. No need for makeup for fresh water or anything?

A. No.

Q. Will there be any additional work to be done to any of the producing wells before the injection gets started?

A. No, at this time we foresee no further well workovers, remedial work to be done to those producing wells, prior to the implementation of the flood.

Q. Now, you said the facilities figure.

A. Yes.

Q. Would that include additional tanks and such as that?

A. Right, that would include additional tanks for the waterflood itself, and the two quintuplex pumps for the pumping side of it, plus it will include the lines that will distribute the injection water to the injection wells and gathering lines that would gather it from the produced water, from the tank batteries on the produced -- production batteries.

Q. Now, when these -- when this unit is formed, I'm assuming all the -- How many production wells do you have?

A. There's going to be 12 producing wells.

Q. The 12 will all go into a single tank battery?

A. Well, we could do that that way, have a central battery.

Right now we were going to realign some of our current batteries, and the proposal under the cooperative agreement was to keep the current, you know, lease batteries.

If in fact we do have to take this pilot into a unitization, then we would have to consider the effects of a centralized battery.

Q. Will that be required by the BLM if it becomes unitized?

A. Not that I'm aware of, but I'm not sure that the answer to that is no either, so I'm going to have to go *nolo* on that one, I guess.

Q. But in all aspects of -- I guess the production will be measured separately --

A. Yes, that is correct.

Q. -- for this particular project?

A. Yes, under the unitization or the cooperative agreement, definitely.

Q. Do you have a proposed name for that unitization

or a proposed name for this project?

A. Well, no, I don't yet.

I had initially started off with just the South Dagger Draw Pressure Maintenance Pilot, but I don't have -- I have not selected a unit name yet, come up with a name that would sort of set it off or identify it as a separate identity.

But as soon as we have reached that point and are further along in our dealings with the Bureau of Land Management and have come up with the things that you have just mentioned, we'll certainly notify the Oil Conservation Division of that.

Q. About how long will that be, before you will know --

A. Well --

Q. -- about the unitization?

A. -- as I said, I'm hoping to begin injection in early March of 1995, so I hope to have this process behind us and taken care of by that point.

EXAMINER STOGNER: Mr. Carr, can you think of anything else we need to cover for the enhanced Oil Recovery Act portion of this particular project?

MR. CARR: I don't believe so, Mr. Stogner.

EXAMINER STOGNER: With that, I have nothing further either.

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

EXAMINER STOGNER: Case 11,161 will be taken under advisement.

(Thereupon, these proceedings were concluded at 11:10 a.m.)

* * *

CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL December 19th, 1994.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11161 heard by me on 15 Dec. 19 94.

, Examiner
Oil Conservation Division