BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 7, 1970

EXAMINER HEARING

IN THE MATTER OF:	)	
Case 4204 being reopened at the request of the applicant, Mobil Oil Corporation.	)	Case No. 4202

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: Call Case 4202.

MR. HATCH: Case 4202. In the matter of Case 4202 being reopened at the request of the applicant, Mobil Oil Corporation.

MR. SPERLING: If the Examiner please, James E. Sperling of Modrall, Seymour, Sperling, Roehl and Harris, Albuquerque, appearing for Mobil Oil Corporation.

I have one witness, Mr. Kelly.

MR. NUTTER: Are there other appearances in this case?

MR. HINKLE: If the Examiner please, Clarence Hinkle, Hinkle, Bondurant and Christy, Roswell. I would like to enter an appearance on behalf of Atlantic Richfield Company.

(Witnesses sworn).

(Whereupon, Applicant's Exhibits 1 through 6 were marked for identification).

MR. SPERLING: If the Examiner please, as the call of the case and the docket has indicated, this matter has been reopened at the request of Mobil Oil Corporation who was the original applicant in Case No. 4202.

The hearing in 4202 was held on August 27, 1969, and thereafter on September 4, 1969; the Commission issued Order No. R-3823. In essence, this order authorized the institution of a waterflood project in the Langlie-Mattix Queen Unit Area in the Langlie Mattix Pool.

The request, as contained in the application at that time, was granted in all particulars with the exception that the request for permission to drill an injection well designated as Unit Well No. 14 on the easterly side of the unit area was denied.

Thereafter, Mobil has filed this application and as a basis for the application, has set forth and will present evidence to prove that the necessity for the drilling of a well in the vicinity of Unit Well No. 14 is paramount insofar as the success of the flood and the recovery of substantial quantities of oil in the magnitude of approximately two hundred thousand barrels of oil; which, we are prepared to show can be recovered through the maintenance of the integrity of the pattern proposed and authorized by the order establishing the Langile-Mattix Queen Unit Area.

As we stated at the time of the prior hearing,

negotiations were underway at that time with Atlantic Richfield with a view toward either the inclusion of the Atlantic Richfield acreage within the unit area that consists of a 40-acre tract within Section 14 in Township 25 South, Range 37 East, and designated as the Stewart A 2 Well: is that correct?

THE WITNESS: One.

MR. SPERLING: Stewart A 1 Well or the acquisition of that well from Atlantic Richfield with a view towards its conversion to an injection well.

The negotiations which were in progress at that time have continued without success to this time and we will present in documentary and testimony form the nature and extent of these negotiations to date.

The present application, of course, reasserts the request of Mobil to be permitted to establish an injection well in the vicinity of Well No. 14 as designated on exhibits previously submitted to the Commission in connection with the hearing on August 27, 1969.

The evidence and testimony will develop, as it progresses, the nature of the reserve calculations which have been made by Mobil in connection with the study leading up to the formation of the Langlie-Mattix

Queen Unit and will, of course, give an additional insight into the necessity for the completion of the flood pattern in the manner proposed. With that statement, we will proceed with the testimony, Mr. Examiner.

PAT KELLY

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. SPERLING:

Q Mr. Kelly, would you state your name, please, your place of residence and your employer and the nature of your employment?

A I am Pat Kelly. I live in Midland, Texas. I work for Mobil Oil Corporation as petroleum engineer.

Q Mr. Kelly, were you present and did you testify at the prior hearing held on August 27, 1969?

A Yes, sir.

Q So that your qualifications and background are a matter of record before the Commission?

A Yes, sir.

MR. SPERLING: Mr. Kelly's qualifications acceptable --

MR. NUTTER: Yes, they are.

MR. SPERLING: -- for the purpose of this hearing?

Q (By Mr. Sperling) Mr. Kelly, will you please refer to what has been marked for identification as Mobil's Exhibit No. 1 and identify it and explain what it consists of?

A Mobil's Exhibit 1 is a package of three plats identified further as figures 1, 2 and 3. They are all constructed from the same base map and portray slightly different information.

Figure 1 shows, colored in green, two water-flood patterns that will be served by proposed injection Well No. 14, which is the subject of this hearing. The acre colored in green is what I interpret as floodable acreage and amounts to 52 acres for the pattern that will be served by producing Well No. 9 when it is drilled and 61.23 acres that will be served by producing Well No. 8, which is currently producing.

Figure No. 2 portrays, colored in green, what I interpret as the floodable acres in those same two patterns if we assume that there is no injection well at the location of proposed Well No. 14. In that case, there are 30.1 floodable acres to be served by proposed

producing Well No. 9 and 30.97 acres that will contribute to production from Well No. 18.

I might point out that if this developed to be the final flood pattern in this area of the unit, that I don't think we would drill proposed Well No. 9 at that location indicated on this plat. We would probably move it over inside the pattern so as to have a squeeze on it rather than produce it from outside the pattern as indicated here.

Figure No. 3 of Exhibit 1 shows, colored in green, the floodable acreage within the patterns served by injection Well No. 14 and shows, colored in red, the acreage that would be added to those patterns by use of the Atlantic Stewart A Well No. 1, as an injector and such well is shown on this map as a Sinclair Stewart A No. 1.

Sinclair had been acquired by Atlantic after this map was prepared. That incremental acreage, colored in red, is 23. All of the numbers that I have referred to with respect to this exhibit are shown in the upper right-hand corner of each plat.

Q Now, Mr. Kelly, have you been the reservoir engineer in charge of that particular project from its

inception?

A I have been the reservoir engineer charged with working on this project from the start. I evaluated it before we purchased it from George Buckels and we did buy it from him on May 1st --

Q Of 1969?

A -- of 1969. We set about immediately to try to unitize it, which we were successful in doing and put this waterflood in.

We did start -- we have completed our well conversion construction of our distribution and injection station. We have obtained a water supply from the San Andres and we began injecting at a rate approximating thirteen thousand five hundred barrels per day toward the first of December, 1969; the second, third or fourth or something like that.

We were testing wells from the first of the month and got it under full scale injection by around the third or fourth. We are currently injecting through all of the wells shown on the plats, marked Exhibit 1, as injectors with the exception of Well No. 30 and, of course, proposed injector No. 14.

The injection wells that serve the remainder

of the patterns of producers No. 9 and 18 are taking water at rates generally between seven hundred and a thousand barrels a day right now.

Q Now, Mr. Kelly, in preparing these area estimates and so forth, as shown on Exhibit 1, figures 1 through 3, what was the basis for your calculations of those aerial representations there?

A The areas that I have indicated as floodable acreage are simply the areas enclosed within straight lines connecting the injection wells where they confine a pattern and injection in producing wells where a pattern is not confined.

I haven't measured this acreage on the ground. I have calculated it from scale measurements from a one-inch to one thousandth map.

Q Now, still referring to the various figures in Exhibit No. 1 and with particular reference to figure No. 2, explain the reason for and, in your opinion, the necessity for and the essential nature of the location of a well at the approximate location of proposed unit Well No. 14. What would be the effect of not having a well in that area?

A The eastern limit of the Langlie-Mattix Queen

Unit represents in general the eastern limit of oil production from the Queen Formation in this area. In general up-dip to the east from the east boundary of the unit, the Queen wells have produced either gas or predominately gas.

There is a sizeable gas cap up-dip to the east. There is quite a lot of Queen sand up there. That gas cap I think has been substantially depleted now to a very low pressure. There are still commercial gas wells completed in it, but it is at a very low pressure, I imagine approximately equal to the very low pressure that we have in the oil rim.

If there is not an injection well near the up-dip limit of the oil column to confine the oil to the patterns down-dip, that oil will be forced up into the gas cap and in my opinion will be irretrievably lost. I don't believe there's a chance that there are any wells up-dip that will produce any commercial oil that will be pushed up into the gas cap out of these patterns.

Q Now, figure 3 of Exhibit A shows an area in red there which you identified. Do you have anything further to add with reference to that indicated red area and how you arrived at those calculations?

A Well, once again I just measured the dimensions of that area on a map and calculated the acreage. I'm sure it is representative of the approximate incremental amount of floodable acreage.

There is about -- slightly less than six of those acreas that's colored in red underlie the Stewart A Lease and the remainder of the twenty-three acres underlie the -- for the most part, the Langlie-Mattix Queen Unit.

I calculated 5.8 acres, in red, underlie the Stewart A Lease.

Q Now, do you have anything further to add with reference to Exhibit 1 at this time?

A I believe not at this point.

Q Please refer to what's been marked as Exhibit No. 2 and explain what it portrays and its purpose.

A Exhibit No. 2 shows several 40-acre tracts, colored; and, also shows a number typed on each of those tracts. These colored tracts are the ones which will contribute oil reserves under waterflooding to the pattern served by Wells No. 9 and 18.

The numbers typed on each of those 40-acre tracts are simply the January 1, 1969 oil recovery from

that tract divided by 40 acres to reduce it down to barrels per acre primary recovery or January 1, 1969 cumulative for that tract.

Q Now, the numbers that you are referring to; are those in large type? For example, 3209, 2819 and so forth?

A Yes, sir. For Unit Well No. 8, which is the current producer in the pattern that No. 9 will be producing out of, that 40 acres recovered 3209 barrels per acre to the first of 1969; Unit Well 13 had recovered 2819 barrels per acre; Unit Well 18 had recovered 3102 barrels per acre; Unit Well 17, 2665 barrels per acre and Unit Well 21, 2597 barrels per acre.

MR. NUTTER: What was the date on that production?

THE WITNESS: January 1, 1969.

Q (By Mr. Sperling) What is the significance of the selection of the date of January 1, 1969 as a basis for these calculations?

A There is nothing really special about that date as the date for selecting cumulative production except it is fairly current.

There's been very little oil produced by these wells since January 1, 1969. They have been from a half to two or three barrels a day producers for some years and January 1, '69 cumulative was a substantial factor in the participation formula for the unit.

It was a readily available figure and I have taken it as approximating primary oil. I believe there's a little primary oil left on the unit, but it is approximately equal to January 1, 1969 cumulative.

I made this calculation for purpose of arriving at some reasonable basis for empirically determining the waterflood reserve that should be recovered out of these patterns using the best data that I have which is primary performance.

Q Now, please refer to Exhibit 3, which appears to be in tabular form a companion of Exhibit 2. Explain what it is.

A Exhibit 3 is a calculation of the waterflood reserves for the patterns that will be served by producing Wells No. 9 and 18.

If we are to drill and use proposed Well No. 14 as an injector, based upon the average primary recovery within the pattern served by Well No. 9 in barrels per

acre making the assumption that secondary oil will equal primary oil, I have determined that 3100 barrels per acre will be recovered within that pattern if it is confined and that that recovery will amount to 161,000 barrels of oil.

Similarly, I have calculated the average barrels per acre recovery in the pattern served by producing Well No. 18, which is 2899 barrels per acre and assuming that that pattern is enclosed, I believe we will approximate a primary oil -- I believe that secondary oil will approximate primary oil from it and we will get about 178,000 barrels of oil by flooding.

If we assume that Unit Well No. 14 is not drilled and we proceed with injection as it is currently underway, we would move proposed unit producer No. 9 inside the pattern and we would achieve a conventional waterflood recovery because we have a squeeze on it and we would still get 3100 barrels per acre out of that pattern or 93,000 barrels of oil with the subsequent loss or resulting loss of 68,000 barrels of oil to the gas cap up-dip out of that pattern.

In the case of the pattern served by Well No. 19, that pattern is not enclosed sufficiently for us to

get anything like a conventional recovery out of it if there is no injection up-dip.

I have estimated that the recovery out of the swept acreage will be no more than half the conventional recovery or half of 2899 barrels per acre, giving us 45,000 barrels of waterflood oil out of that pattern, I think at the best, with the result being that 133,000 barrels of oil would be pushed up-dip into the gas cap.

Adding those two figures together, the 133,000 and the 68,000 barrels, that I think would be lost from those two patterns to the gas cap if we don't inject up-dip, I come up with 200,505 barrels that I think represents the waterflood oil that we will lose without up-dip injection to even enclose those patterns.

Q You may have touched upon this before, but is there any possibility in your opinion of any portion of the 200,000 barrels, which you have referred to as being lost to the gas cap, being recovered from any of the wells located to the east of the unit area?

A It is my opinion that there will be no commercial oil produced up-dip from these patterns whether we inject at the location of No. 14 or not inject at the

location of No. 14.

I believe that is the case because it is a low pressure gas cap up-dip from us which will readily suck up anything that is pushed out there. I don't think that an oil bank will be held in the vicinity of a well up there long enough or under a high enough pressure for the well to produce any commercial oil.

I expect that any wells that are up there under temporarily abandoned condition right now will probably require an investment of somewhere between ten and fifteen thousand dollars to put them in shape to produce and I just don't believe that the wells ever produce enough oil to pay for that investment under either set of circumstances.

I have some information that I have run across that I can generate a little later in the testimony that I think would document my conclusion there.

Q Now, mention was made earlier as it is made in the application, as well as the prior hearing, of negotiation efforts as between Atlantic Richfield and Mobil leading to some sort of an agreement with reference to the disposition of the Stewart A 1 Lease, which you have already identified.

Would you please refer to Exhibit 4 now and tell us whether this reflects in documentary form the nature and extent of the negotiations to date as between Mobil and Atlantic?

A Exhibit No. 4 is a sheet of correspondence which represents the written negotiations that have taken place between Atlantic and Mobil up to this point concerning the Stewart A tract.

I might point out that there have been a number of telephone conversations had between representatives of Mobil and Atlantic about this subject over a period of some months beginning as early as May of 1969 and that they have continued up through the recent past.

The first thing that -- the first contact that we had with any representatives of Atlantic on this subject was in the form of a telephone conversation between myself and the Sinclair reservoir engineer that was, at that time, looking after this area for Sinclair. That was in May.

We had several conversations about how we ought to go about flooding the unit and Stewart A Lease; whether we ought to try to do it on a cooperative basis; whether we ought to try to buy it out or just what we

ought to do.

Pursuant to those conversations, I wrote a letter, which is in this package and is dated June 16, 1969; addressed it to Atlantic in Midland, as Atlantic had, by that time, taken over Sinclair and it is my understanding that this letter was forwarded onto the Roswell office of Atlantic; it was never handled in Midland and this letter proposes that Mobil would like to inject wells near the western corners of the Stewart A 40-acre tract and -- and would ask Atlantic to participate in those to the extent of 25 percent in each well at a well cost of $38,000.00, bring the total to $19,000.00 because I really didn't believe Atlantic had much chance of getting any oil out of that Stewart A No. 1, if we inject cooperatively in that way.

We made an alternative offer to buy the lease and well, queen rights, for $12,000.00 That is set forth in this letter. The second letter in Exhibit 4 is a letter from Atlantic to Mobil dated July 22, and it, in summary, rejects the proposal made by Mobil in the June 26 letter and suggests that Atlantic would like to hear from us concerning basis for flooding the Stewart A Lease.

I might point out that in the interim between

the time the June 26 letter was written and the July 22 reply was written, there had been at least one telephone conversation between a representative of Mobil and a representative of Atlantic, which pointed out that we had changed our waterflood plan along the east side of the unit and at that time intended to drill only one injection well along that east side rather than the two that we had proposed to the June 26 letter and so that changed the proposal a little bit.

The next letter in the sheet of correspondence is a November 14, '69 letter from Mobil to Atlantic setting out Mobil's plan to try to enlarge the Langlie-Mattix Queen Unit to include three tracts which would even encompass the Stewart A Lease, 80 acres out of the Mobil Federal X Lease and 40 acres owned by Mr. Eppernauer immediately offsetting tract No. 14 to the west.

Now, we proposed in that November 14 letter that the Stewart A Lease should come in for a phase two participation equaled to .3504 percent, which was the relationship of 12,500 barrels waterflood reserves for bringing the lease into cumulative recovery from the total unit up through 1-1-69.

I point out that in the interim between the July 22 reply of Atlantic and the November 14 further proposal of Mobil, there had been the OCC Hearing at which our application to drill and use No. 14 was denied and there had been some telephone conversations with representatives of Atlantic suggesting enlargement of the unit along the lines portrayed in this November 14 letter.

And, our joint interest people had arrived at the conclusion that Atlantic wasn't really interested in this proposed enlargement over the telphone but we felt like we needed to document the offer and so wrote the letter and did so on November 14; four days later, on November 18, there is a letter in the files which is the next one from Atlantic.

Q Now, before you proceed to that, let me inquire as to where the 12,500 barrel figure and the participation factor of .3504 percent came from. What is the basis for that?

A At the August 27 waterflood hearing, Atlantic's witness at that hearing testified to the fact that he thought that injecting into the Stewart A 1 rather than the unit Well No. 14 would result in the added recovery

of some 12,500 barrels of waterflood oil by the unit.

That's where the 12,500 barrel figure came from. The participation of .3504 percent grew out of a close approximation of as close as I could come readily, to approximating the vaule of the lease to the unit in the same proportion that the other tracts that are participating in the unit do, so, in general, the various tracts that are within the unit now have phase two participation, which represents the approximate relationship of waterflood reserves contributed by each tract to the unit.

The waterflood reserves claimed by Atlantic for injecting into Stewart A No. 1 were 12,500 barrels and I just attempted to calculate a percent that was in the same proportion that the rest of the tracts are participating in this waterflood and under those circumstances the enlargements that we are proposing that was .3504 percent.

Q So that 12,500 represented Atlantic's approximation of their calculation of incremental oil to be contributed rather than yours; is that correct?

A Yes, sir. That was Atlantic's calculation or estimate.

Q All right. Proceed.

A The next letter in the file, as I pointed out, is a November 18 letter from Atlantic declining to participate in the enlarged unit; pointing out further that they didn't want to accept our renewed cash offer of $12,000.00 for the well and stating further that unless we could raise our offer to $20,000.00, Atlantic wouldn't be in a position to recommend a sale of the property to its management.

My recollection on receiving the November 18 letter was basically that negotiations had broken down and I didn't see any hope at that point of Mobil and Atlantic ever coming to any agreement on the value of that tract to the unit; so, I immediately asked our people to pursue an application to -- a renewed application before the OCC to drill and use our No. 14 as an injector to close up that pattern on the up-dip side.

I think we did write a letter to the Commission and asked that a hearing be scheduled sometime around the end of November. My understanding is that there was some

question about whether we could get this application heard and as result, we got together and decided to write a formal application which our attorney, Mr. Sperling, prepared and later filed and while discussing the desirability of setting out everything as clearly as we could in the application, it came to our attention that we may not have communicated clearly with Atlantic in our prior offers.

I have reviewed the correspondence and some of it doesn't seem to be very clear, and so I decided to try to set it all down again in a letter, which I wrote on December 11, setting it out as clearly as I knew how, what our proposals were and asked Atlantic to reconsider.

In that letter, which is part of the correspondence file, I pointed out that during the interim between the November 14 letter and this letter that the Eppernauer tract had been withdrawn from consideration by Mr. Eppernauer for enlargement and this changed a little bit the basis for computing phase two participation.

It raised the protective phase two participation to .3614 percent. I pointed out in the letter that I thought it would cost about $18,000.00 to put Atlantic's well in shape to use as an injector and that, added to the

$20,000.00 price they wanted for the well, would bring the cost of the tract to really, in effect, to $38,000.00 investment at the outset which would have equaled the cost of a new well.

That's almost what we spend on digging a new well, within two or three thousand dollars of it; sometimes we are a little over, sometimes we are a little under.

My own attitude about that is that there's got to be significant difference between the outlay in one case and the other because I think that thirty-two year old well is going to have casing leaks in the future.

I would be greatly surprised if it didn't and if we were to use it, I feel sure we would have some repair and some pollution problems with it as time goes. If we drill a new well and have it cased through the pipe, I think we will have much more effective control over where the water goes than we will in the old hole, which was shot with 140 quarts of nitro even if we are successful in getting the well cleaned out and setting the liner in it and perforating.

The difference as I see it between that

Atlantic wants for the well and what we have been in position to offer from the standpoint of mechanics price is $8,000.00. We have offered $12,000.00. They want $20,000.00 and that's about where that stands.

I can't recommend to my management that we go any higher on a cash offer than we have already gone. I half suspect that we have gone too high already. I tried to analyze these risks in the letter and clarify our position as best I could.

On January second there was another letter written from Atlantic to Mobil, once again declining the offers or proposals that had been made in the December 11 letter and 3 -- I think three separate proposals were set out in Atlantic's January two letter and I'll try to describe those for the record.

I start out by saying that in the last part of paragraph two, on page one of the letter, I think Atlantic sets out what it is interested in getting out of this deal. Where I'll quote, it says "we believe that Atlantic Richfield should be compensated not only for the value of the incremental oil to be recovered but also for the value of our well as replacement for the Langlie-Mattix Queen Unit No. 14."

I believe that all of these three options that Atlantic has proposed which follow in this letter are directed toward this end. In the next paragraph, paragraph three is what I interpret as the first of these proposals and I'll quote "participation of our well in the unit on the basis of reserves only should be based on the relationship of the primary recovery of our well to the cumulative primary recovery for the total unit. Please note that our Stewart A No. 1 has recovered 62,080 barrels of oil on primary as of January 1, 1969, which would give us a 1.7949 percent participation phase two."

I interpreted that has a proposal that the tract be brought in for 1.79 percent that we attempted to negotiate in. I would like to comment on that to this extent. I believe because of the location of the wells, the production history that's been enjoyed by the tracts that are currently within the Langlie-Mattix Unit, I believe that the relationship of cumulative recovery to the total cumulative recovery for the unit is a reasonable approximation of the waterflood reserve that will be contributed by those tracts to the unit.

I do not believe this is the case with respect

to the Stewart A Lease and the reason why I don't is because the well on the Stewart A Lease, the Queen Well, was drilled as far down dip as I think legitimately possible. It's 330 feet about from the west line of the lease and the adjoining well to the west is 330 feet approximately from the west line of its 40-acre unit and I believe that a -- the line share of the oil that was produced on primary by the Stewart A No. 1 came from the east part of that adjoining 40 acres.

One of the exhibits submitted in the earlier hearing and it is an attachment to one of the exhibits which will be submitted in a moment, is a tabulation of production for the Stewart A No. 1. It shows that the well began producing as the Carl B King Drilling Company Stewart A No. 1 in 1938 and during the first two years of its life produced something over half of its ultimate recovery, that is 32,000 barrels of oil.

It quit producing oil in 1953 when it made 792 barrels for the year and I suppose was shut in for some years until 1958 when it was reported to have produced 917 barrels of oil. The following year, in 1959, there were 116 barrels of oil production reported from the well and beginning in 1959, gas production was

reported and that is the only production attributed to the well from 1959 to 1963 when the well ceased production.

My -- it's my opinion, from having examined such records as I have been able to lay my hands on with regard to that Stewart A No. 1, that it in all probability had a thin oil column present in it in the beginning and that that oil column has been drained.

I have some serious reservations about our ability to waterflood that thin oil column very effectively if we should inject into it, although I should expect there should be some waterflood recovery from it.

With what I would suppose, from having examined some recent logs of wells that we have deepened down dip, there is probably somewhere in the neighborhood of 60 to 90 feet of gross sand in the vicinity of the Stewart A Lease.

I think most of that is gas sand and at the present time I judge that all of it is gas sand. As we would start to inject into that well in an effort to fill up the gas sand to prevent it being filled up with oil, as it would pressure up the oil column down dip, I think we would run a terrific risk of overriding the thin oil

column which I think is in the bottom of the sand and by passing a good bit of it because I think the water will move more readily through a gas sand.

Proposal number 2 -- I need to comment one point further on this first proposal. Going back to the idea that Atlantic should be compensated both for the reserves and the well, I would like to point out that once again that I believe various tracts in the unit are participating under the formal in the approximate relationship of their reserves, have the total reserves for the unit.

All those tracts furnished wells to the unit when they came in and I can't see any logical basis for the Stewart A tract or any other with a well on it not furnishing it on a basis, which is comparable to the basis that the other tracts participate it in.

I think we owe it to our partners and to our royalty owners to insure that something approximating that takes place if it is going to take place at all.

Proposal number 2 is found in the third from the end paragraph on the second page of the letter and I'll quote "combining the value of the well bore and the incremental oil, we consider the Stewart A No. 1 to

be worth $15,500.00, plus a phase two participation of .3614 percent.

The preceding paragraph described the method by which Atlantic was able to calculate the value of the well bore at $15,500.00. I think I just commented on that, the propriety of taking that action previously.

The final proposal is in the final paragraph of the letter. I interpret that Atlantic has renewed its proposal to accept $20,000.00 for the well. Once again, I might say that I think that -- well, because of the talks that I had had and others of us had had with the people in Sinclair that were working on this area at the time we were trying to put the unit together, I came -- I talked our management into making the best offer that I thought we could to start with and didn't leave any room for negotiations.

The $12,000.00 figure, I believe, is as high as we can go without deluding our partners interest.

Q Now, Mr. Kelly, you have previously made references to the Stewart A 1 Well in historical fashion. Please, now, refer to Exhibit 5 and state whether or not some of the calculations and statements which you have

previously made are based at least, to some extent, upon the contents of the information contained within Exhibit 5 and you may comment or make reference to particularly significant portions of the exhibit that you feel substantiate conclusions that you have already stated.

A Exhibit 5 is a package of information bearing on the Stewart A No. 1. It comprises the -- I believe the total of the information that I have had available to me. Page 1 is a copy of the scout report that I think is probably available to everyone.

It comes from a scouting service. It shows that the well was spotted in February, 1938; that it was shot with 140 quarts of nitro in March of 1938 and that it was completed flowing 70 barrels of oil per day on May 15 of 1938.

The next two sheets are copies of handwritten notes picked up by one of our people in Hobbs from the OCC well records in Hobbs, and I'm not sure what extent this represents the total of the records that the Commission has there, but it does provide a well record, that is a formation record with noted comments opposite various dates, showing what happened when.

The scout ticket, together with the data shown on the next two sheets, indicated to me that the well had made about five and a quarter million cubic feet of gas along with 70 barrels of oil from an interval between the casing shoe at 3271 feet and the total depth, which I believe at that time was 3395.

It shows further that there was a packer set in the open hole after the well was shot at 3300 feet and that the well after that time made just enough gas with the oil to flow, indicating that the -- most of the gas had been shut off by that packer.

The records that I have been able to turn up on this part of the Langlie-Mattix Pool, in searching our files and getting the information from other operators, indicates that there has been a general acceptance by operators in this area of a gas-oil contact in the Queen somewhere around minus 50 feet.

I interpret the performance on completion of the Stewart A No. 1 as tending to support a conclusion that the gas-oil contact is below the casing shoe which is 3271 feet and above the point at which the packer was set, which was at 3300 feet or minus 171 feet. That's a 29-foot interval in there.

I think that probably pretty well buttons up the gas-oil contact in the area of this well, at least under the circumstances as they were then in evidence. This well was -- the casing was perforated according to the OCC records in 1953 from 3171 to 91 and 3131 to 46.

The production record, which is another attachment to this file, doesn't show any production from the well immediately after 1953, although the Commission's record carries an AOF test of seven million cubic feet per day. I'm not sure whether those perforations that are currently -- I judge they are currently in the casing -- are opposite the Queen or the Seven Rivers. It may be either one.

The next sheet is the production tabulation that I referred to earlier and the final sheet in this package is diagrammatic sketch of the well bore as we understand it to be at the present. I don't know. The records don't show whether there's any junk left in the well. I don't know whether Atlantic's records show that.

Q Do you have any other comment concerning --

A I don't think of any other right now.

Q Now, you stated earlier, Mr. Kelly, that you

felt that substantial quantities of oil would be lost to the gas cap area and I assume that some of the information that you have taken from Exhibit 5 substantiates your conclusion that there is a definite gas cap area to the east.

Assuming that to be the case, have you made any study of any areas of Queen production which have been subjected to waterflood which show the result of the failure to provide a barrier or a back up insofar as a gas cap area is concerned in a waterflood situation?

A I think in general there are two ways to waterflood the Queen successfully and both of them really resolve to the same thing and it may really be the case anywhere.

I think you have to confine the oil within boundaries. You have to enclose it with injection patterns or you have to have some rock conditions which contribute to closing off the oil from escaping.

In the instant case, I think that we have a tremendous gas cap sand up dip from us that will quite readily accept anything that's pushed its way and that it wouldn't offer very much resistence to any fluids entering it.

I think they will move right on up there in response to a pressure differential down dip. Now, if there were an injection well up there or if there were a permeability barrier up there, I think it's entirely possible, in fact probable, that quite a nice volume of oil ought to be produced.

If you can seal off the thief zone, which, in this case is the gas cap, from the high pressure oil and you have a producing well around in the oil zone, well you can produce quite a lot of it. I have seen this happen in some cases; both things have happened.

I have seen this; get oil hemmed up against a permeability pinch-out and produce a fantastic quantity. I have seen people try to produce oil without any back up and I have seen them fail, where there was no injection outside or no permeability barrier.

The case that I am most familiar with, because I had occasion to look into it sometime in the past, is in our EK Queen Unit Waterflood. M. O. Davis, in 1968, reentered a well, offsetting our Queen flood there in Section 19, and completed for production.

The production records show that the well

has produced to a cumulative recovery of 705 barrels of oil since it was completed in 1968, and that it hadn't produced at all since June of 1969; and I think the reason why the well hadn't recovered much oil is because it's not backed up.

There isn't any injection outside of it and there is no permeability barrier to fence the oil up for it and the depleted condition of the sand outward and away from the waterflood has encouraged the oil and water that's injected in the waterflood to move on out there before that well had much of a chance to produce any of it.

This is the only case where this has happened that I have any data with me on to talk about today. I have a map of the EK Queen Unit with the location of M. O. Davis, KG No. 1, indicated on it and that is --

Q Exhibit 6?

A That's Exhibit 6; yes, sir.

Q Do I understand, then, that you would anticipate the recovery or the characteristics to be similar in the M. O. Davis well to that which would be encountered in the Stewart A 1 Well?

A I think basically the same condition would

prevail. I wouldn't venture to put a number on the barrels of oil that might be produced by the Stewart A No. 1 if a pumping unit were put on it, but I will say that I am convinced it will never be enough oil to pay the cost of putting equipment on it, the tubing, the pumping unit, the rods and the pump, the well work to put it on production.

I don't think that condition will change whether we inject at the location of No. 14 or inject under the pattern that has thus far been approved by the Commission.

I think you have to have it backed up to produce any of that oil and in either case, I would expect any oil that would push into the gas cap and get it over to that well, that quite a nice share of it would be lost to residual saturation of the gas sand before it got to the well to start with.

MR. SPERLING: Do you have anything further?

THE WITNESS: I don't think I have anything else.

MR. SPERLING: At this time, Mr. Examiner, we would like to offer Exhibits 1 through 6.

MR. NUTTER: Mobil's Exhibits 1 through 6 will be admitted in evidence.

That's all the direct examination of this witness?

MR. SPERLING: Yes, sir.

MR. NUTTER: The witness will be available for cross examination after the recess. We will now recess this hearing until one-thirty for lunch.

(Whereupon, a recess was held until one-thirty p.m.)

MR. NUTTER: The hearing will come to order, please.

MR. SPERLING: Mr. Examiner, with your permission I would like to reopen and ask one question.

MR. NUTTER: Fine.

Q (By Mr. Sperling) Mr. Kelly, in the event that the permission of the Commission is granted to the drilling of the No. 14 Unit Well, what would be Mobil's position with reference to the participation or non-participation of Atlantic on the basis proposed and for what period of time?

A I am authorized to represent that either of the proposals that Mobil has made to Atlantic will continue to be honored following Commission's approval of our application

until we have reached a point of absolute commitment on drilling of the well, which, in my judgement, would take at least ten days.

Now, we will say that either of those proposals we would hold open for ten days, and in the event that nothing should be worked out within that period, we would go ahead and drill our well just as soon as the contractors move in on it.

We haven't talked with the contractor about this location, but experiences with other wells that we have drilled in there, I think within ten to fifteen days we can have a rig in location digging and I am very anxious to get the hole down and water started in.

MR. SPERLING: Thank you. That's all.

MR. NUTTER: Any other questions of Mr. Kelly?

MR. HINKLE: Yes. I have a few here.

CROSS EXAMINATION

BY MR. HINKLE:

Q Mr. Kelly, on your testimony this morning you testified, I believe, in effect that the Stewart A No. 1 Well was in a gas cap area.

A Predominantely so, yes, sir. It is now. At one time, it produced oil, but there is no moveable oil

that will move into that well bore there now, I don't believe, because it produced only gas for the last several years.

Q What do you base that on?

A From the production records of the well.

Q Now, isn't it possible that this Stewart A No. 1 is perforated into higher zone than some of the other wells in the unit?

A I haven't seen a log of the well, so I don't really know what sand it has in it or what sand might be below its total depth.

Q And there are some gas sands above in this whole area, are there not?

A I didn't understand.

Q There are some gas sands above the Langlie-Mattix Pool in this whole area; isn't that right?

A The Queen sand, which takes in what I call the upper Queen and Penrose members, that all of it is gas bearing to the east of the unit and there are a number of gas wells that produce from the Penrose or Basil member of the Queen.

There are also, I'm sure -- although I can't identify one specifically -- gas wells completed in the

Seven Rivers Sands, which overlie the Queen.

Q The Jalmat Gas Pool is above this whole area, is it not?

A I believe that's what we call the Yates, the Jalmat Yates Gas. It is shallower still than the Seven Rivers.

Q Well, it's still true that this well has produced over sixty-two thousand barrels of oil; is it not?

A I accept that.

Q And you are saying, then, that this is essentially gas well although it's produced six-two thousand barrels of oil. How can you say that?

A I think for the last several years of its producing life it abundantly displayed that it is only a gas well.

Q It was recompleted, was it not, as a gas well or reclassified as a gas well --

A Let me refer to the records on that.

Q -- from its original classification as an oil well?

A I'm not certain of the formal classification of the well, but I am certain that the production data shows what kind of well it was, however it was classified, and

for the last several years of its productive life it was a gas well according to the production records.

Q Are you satisfied with that? I am if you are.

A If I have answered your question.

Q It was reclassified, I think.

A I'm not sure. I suppose it was. I see here that the notes that I have indicate under date of 12-31-'53, that the well as shown on Form C104, was interpreted as an extension of the Langlie and not the Justice; so, I suppose that was recognition of the nature of the well.

Q Now, refer to your figure 2 of Exhibit No. 1. Now, if I understood your testimony correctly, you have shown in green that which you indicate would be the sweep from the injection well, is that right?

A I have shown in green the acreage which I interpret as being floodable acreage within the patterns of producing wells No. 9 and 18, assuming there is no injection up-dip from the wells that are currently on injection.

Q Then, are you saying to the Commission that if water is injected in Well No. 21 and 10 and 2, that that's the only direction the water would go in; that's the only direction of sweep?

A I don't see Well No. 10 there. The injectors which serve those patterns --

Q It's 13.

A -- are wells 2, 13, 17, 21, in addition to the line injector of Gulf on the offsetting SLM Unit Well No. 128.

No, sir. I don't represent that those are the only directions that the water will go. I do represent that these are representative, that this drawing represents the floodable acreage, the acreage from which oil will be swept to those wells.

Q But, it does not represent the acreage which would be swept or flooded by reason of these injection wells, does it?

A I have offered this for the purpose of showing only the acreage which would be swept to these producing wells. I think I have probably said two or three times that the injectors would push oil up-dip into the gas cap which would not be recovered by either of these wells and, in my judgement --

Q As far as your unit is concerned?

A -- would not be recovered by any wells up-dip.

Q Wouldn't Atlantic Richfield recover from its

Stewart No. 1?

A It is my opinion that the Stewart A No. 1, under either configuration that I have represented here in Exhibit 1, will not recover any commercial oil.

Q Now, you have testified in effect that this area shown in green is the area which would be swept for your producing wells --

A Yes, sir.

Q -- in the area? All right. If that is the case, if you convert the Stewart No. 1 into an injection well, would it not sweep a larger area and be one of the better injection wells in the whole unit?

A I can agree that a larger area would be swept. I don't agree that it would be the best or one of the better injection wells in the area. It may or may not be.

Q Well, it could be.

A I doubt seriously if it would ever be one of the best.

Q It may or may not?

A It may or may not. I think it's open to question, but in my opinion it probably will not be one of the best. I think that because it has a shot hole there; it has undoubtedly quite a lot of gas sand opposite and I feel we

will probably -- if we were to inject into it, which I will be willing to do -- we would probably have trouble confining the water to the sands that we wanted to go into.

Q Referring now to the negotiations, which you testified to, has Mobil ever offered to Atlantic Richfield to take the tract upon which the Stewart A No. 1 is located into the unit on the same basis that other tracts have been taken in?

A In the final analysis, I think this is the proposal that Mobil has made.

Q Are you still willing to take them in on the same basis as other tracts have been taken in?

A In the final analysis, that is exactly what we have proposed. That is the offer that is open now.

Q Just answer my question. Have you ever offered to take Atlantic Richfield into the unit on the same basis that you offered to other tracts?

A I'll need you to tell me what you think is the same basis.

Q Have you ever explained to Atlantic Richfield what your participating formula is?

A Let me say that I haven't explained to Atlantic

Richfield the details of the participating formula. I have it on good authority that Atlantic Richfield is a royalty owner in this unit and has been furnished a unit agreement with all the details of the participating formula set forth in it.

I assume they are acquainted with it; but, I don't know for certain that they are.

Q You did not furnish them with a copy of the unit showing your participating formula when you made your offer for them to participate on the basis which you offered to participate; did you?

A I'm not sure I follow that. I think I have already said that I haven't explained to Atlantic Richfield at any point about the details of the participating formula. If that answers your question, well it does.

Q Now, refer to your Exhibit No. 1, again, and refer to tract No. 6 which is over on the northwest corner. It has one well; does it not?

A Yes, sir.

Q Isn't that a comparable situation to the 40 acres upon which the Stewart A No. 1 is located?

A No, sir. I don't think so. The tract No. 6 is on the low side of the structure and it would be my

opinion that all of the porous and permeable Queen sand underlying that tract is saturated with oil.

Q Has Mobil taken in tract No. 6 on the same basis they have taken all other tracts into the unit?

A All of the tracts within the unit area have entered on the same basis.

Q There is no other exceptions, no exceptions at all?

A They have all entered on the same participating formula.

Q Yet, you are offering Atlantic Richfield an exception, are you not, to the participation of all other tracts in the unit?

A I am proposing a different method of calculating the participation for the Stewart A tract in an effort to arrive at a participation which will be compatible and in line with the relative participation of all the tracts in the unit together in the total.

Q Now, what is your participating formula under the terms of the unit?

A The participating formula is a two phase formula with phase one being based totally on the perimeter current revenue as defined in the --

Q From your primary production?

A As defined in the agreement. I don't remember precisely what the definition is; it's six months or twelve months current production. Something like that.

That phase one continues until the unit area has produced twenty-three thousand barrels of oil from and after July 1, 1969. Thereafter, phase two takes effect and phase two is based seven percent on surface acreage and ninety-three percent on January 1, 1969 cumulative oil.

Q Based upon the formula, which you have testified to, if Atlantic Richfield should be taken into the unit -- assuming on the same basis as other tracts -- what would the probable allocation of production be to the tract upon which the Stewart A No. 1 is located?

A I'm not sure I understood the question. I'll take a stab at answering it. If you mean by your question if the Stewart A tract should be taken in under the same participation formula --

Q That's right.

A -- and not the same basis, but the same participation formula that is in effect for the unit, what would its allocation be? I haven't calculated that.

I assume that it's fairly close to the number

set out in Atlantic's letter of a few days ago, but I haven't checked it.

Q I believe you testified that you figure secondary recovery would be comparable to your primary recovery; did you not?

A Yes, sir.

Q Well, isn't it reasonable to expect that in this case the secondary recovery, as far as the Stewart A No. 1 tract, would be around sixty-two thousand barrels which is the primary recovery?

A No, sir. I don't think there is a chance that that lease will approach contributing sixty-two thousand barrels to this.

Q That's the way you figured all the other tracts?

A The other tracts are in general down-dip. They have a much thicker oil section underlying them. They have produced to primary depletion in general as oil wells and I think that relative to each other, the participation formula pretty well approximates their relative value within the unit.

I don't think it begins to approximate the relative value of the Stewart A tract within the unit and that the

greatest participation that I see that the tract should have would be relationship to its incremental reserves, if there are some.

Atlantic's representative testified at the prior hearing there were twelve thousand five hundred barrels. I don't know to what extent I accept that myself, but relying on his estimate as being reasonable, I have calculated participation on that basis and I think that is as close as I can come to estimating a participation for that tract, which will be on the same final basis as the other tracts in the unit.

MR. HINKLE: That's all the cross examination. We have one witness I would like to put on.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Kelly, in reply to a recent question there, of Mr. Hinkle's, did I understand you to say that you didn't think the tract had contributed the sixty-two thousand barrels?

A I'm sorry. I don't understand.

Q We are talking about the Stewart A tract, that 40-acre tract. Did I understand you to say that you didn't think the tract had contributed sixty-two thousand barrels?

A The extent of my statement was to the effect that I don't believe the tract will contribute sixty-two thousand barrels of oil to the unit; no, sir.

Q You are talking about secondary oil?

A Yes, sir.

Q Are you saying that the tract did not contribute sixty-two thousand barrels primary oil?

A I think that the line share of the primary oil that was made by the Stewart A No. 1 came from the 40 acres adjoining to the west and to the north and the south.

Q Well, now, some place, if this is in a gas cap here and that Stewart A No. 1 well is in the gas cap and it's depleted oil sand, then the gas-oil contact lies somewhere to the west?

A If you define the gas-oil contact as being that point above which only gas is produced, I think the gas-oil contact probably extends quite a ways down-dip in localities.

Q Did you penalize tract ten in any way in its participation in the unit because the gas cap may extend over into tract 10?

A The unit well 13 on tract 10 was a producing oil well when we converted it to injection.

Q But, the gas-oil contact lies somewhere to the east of well No. 13; right?

A I hadn't finished answering.

Q Between No. 13 and Stewart A No. 1.

A Let me complete my answer to your original question. If I define the gas-oil contact as the point above, which only gas is produced, I would have to say that it has been moved downward over the productive life of the field; but, that doesn't go to say that there is not an oil saturation which will be moved into an oil bank by the encroachment of a water bank at that location and with respect to the Stewart A tract itself, I think the oil sand is probably very thin in relationship to the gas sand that would be present at that location and I think there is a great chance that it will be overridden.

Now, looking to the tract to the west, well No. 13 was a producing oil well just like most of the other wells on the unit when it was converted and I should expect the oil saturation be much higher at the location of that well than it is farther up-dip around the Stewart A. No. 1.

Q Well, if 13 is oil saturated and Stewart A No.

1 is gas saturated, then some place in between there is a gas-oil contact in which there isn't any saturation of oil in one and saturation of gas in the other portion?

A I think there's probably oil and gas saturation through the oil column as it ever existed. I think the gas saturation grades to a higher percentage the farther up-dip you go; but, I think there's oil saturation there.

Q There would be oil saturation, then, in the Stewart A No. 1?

A Yes, sir, within that portion of the sand that was initially filled with oil. I am sure there is an oil saturation there.

Q Now, the tract No. 6 that Mr. Hinkle mentioned before. Is there a completed well out there on that tract?

A Yes, sir.

Q There is?

A Yes, sir.

Q That No. 3 was formerly a producer?

A No. 3 was a new hole. We drilled a new injection well there. There was a producing well a short distance east of the location No. 3, which had been sold -- re-complete to the Yates and sold to somebody else and we couldn't use that well.

Q And it is not shown on this exhibit?

A No, sir. It is not on this exhibit.

MR. NUTTER: I believe that's all. Does anyone else have any questions of Mr. Kelly?

MR. HINKLE: Yes. Mr. Nutter's question to you, as I understood it, was whether or not on account of the gas-oil contact moving to the west, had you penalized any of the tracts you took in like No. 3 or No. 10 on that account, because there was a gas contact there.

I don't think you ever answered his question really.

THE WITNESS: I can't say that we penalized any tract, to express it just that way, for encroachment of the gas-oil contact. What I tried to explain to Mr. Nutter was that gas-oil contact means different things and in the area that the gas has encroached to the down-dip to the west, I think there is a floodable oil saturation and --

MR. HINKLE: Your answer is, in effect, that you have not penalized any of the tracts on account of gas production; have you?

THE WITNESS: I tried to state what my conclusion was as clearly as I could.

MR. HINKLE: That's all.

MR. NUTTER: Are there any further questions of the witness? He may be excused.

(Witness excused).

MR. NUTTER: Did you have anything further at this time, Mr. Sperling?

MR. SPERLING: No, sir.

(Witness sworn).

JERRY TWEED

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, your residence and by whom you are employed.

A I am Jerry Tweed. I reside in Roswell and I am employed by Atlantic Richfield Company as a petroleum engineer.

Q How long have you been with Atlantic Richfield?

A Three and one half years.

Q Have you previously testified before the Oil Conservation Commission --

A Yes, I have.

Q -- and your qualifications as petroleum engineer are a matter of record with the Commission?

A Yes, they are.

Q Are you familiar with the Langlie-Mattix Queen Unit Area --

A Yes, I am.

Q -- and made a study of the wells that have been drilled?

A As would be warranted by our interest in the area.

Q Under the application, which Mobil has filed with the Commission, they are seeking authority to complete injection Well No. 14.

State to the Commission what Atlantic Richfield's objections are to this well as an injection well.

A Essentially, its location as proposed would prematurely water out our Stewart A No. 1 and would not protect our correlative rights being that close to our producing well.

Q How far is this well from the line proposed, the proposed well?

A The proposed well is one hundred foot from our -- it's proposed one hundred foot from our line.

Q How far is it from your well?

A Approximately four hundred fifty feet.

Q Is there any location that might be acceptable for an injection well as far as Atlantic Richfield is concerned?

A Yes. Stated in our letter, which is part of the evidence, I believe Exhibit 4 was it, our letter of January 2 --

Q Exhibit 4 of January 2, 1970.

A -- in the last sentence we say "in the event that Mobil is still unwilling to accept our proposal, however, we would appreciate the opportunity to meet with your representative to discuss possible alternate locations for the Langlie-Mattix Queen Unit Well No. 14. We are not opposed to an injection well in the vicinity. We are opposed to one being this close to our producing well."

Q You would not oppose a location which, in your opinion, would protect correlative rights; is that correct?

A That is correct.

Q Now, to your knowledge, has Atlantic Richfield been offered by Mobil an opportunity to be taken into the unit as far as the tract upon which the Stewart A No. 1 Well is located on the same basis as other tracts have been taken into the unit?

A No, it has not been offered.

Q Has Mobil ever furnished Atlantic Richfield with a copy of the unit agreement?

A We do not have a copy of the unit agreement in our files. I can't say definitely that they didn't furnish one to Sinclair; but, we have not been furnished one since we have operated the tract and we do not have a copy in our files.

Q Atlantic Richfield comes into this situation by reason of the fact that Atlantic Richfield has acquired the acreage of Sinclair; is that right?

A Yes. In the merger with Sinclair.

Q Would Atlantic Richfield be willing to join the unit if an offer had been made to take this tract in on the same basis other tracts have been taken in?

A Yes, we would.

Q Now, in the event it should be taken in, this tract, on the same basis as other tracts in the unit, what, in your opinion, would be the approximate allocation of production under the secondary recovery?

A Well, in a percentage basis that is as stated in our letter, we said that we had 1.7949 percent of the

cumulative recovery. Our participation in the total unit would be approximately this.

It would be slightly lower, maybe 1.75, 1.76, based on Mr. Kelly's formula that he stated. This would attribute to our tract approximately six-two thousand barrels of oil.

Q Now, refer to figure 2 of Mobil's Exhibit No. 1.

A Prior to getting into this, I would like to comment on this idea of a gas cap.

Q Okay. Go ahead.

A Mr. Kelly stated that there was a gas cap in the area and it had moved down to encompass our well. As I understand his testimony, his testimony is based on production from our Stewart A No. 1 Well.

As I understand his testimony, they plan to flood the Queen Formation. Our Stewart A No. 1 was completed, as he testified, from 3131 to 91 through perforations; open hole 3191 to 3395.

The upper interval or considerable of this upper interval would be in the Seven Rivers. It's my contention and conclusion from studying it that the gas has been produced from this upper zone and that, in effect, there is not a gas cap or gas bearing interval in the Queen under-

lying our tract, at least in the vicinity of the well and also had the similar zones been open in their wells offsetting this lease that they would have made gas from those upper zones.

We do not concede, in other words, that there is a gas cap in the zone that he intends to flood.

MR. NUTTER: Mr. Tweed, do you have Exhibit 1 or do you have this schematic diagram there in your pack of exhibits?

THE WITNESS: Yes, sir.

MR. NUTTER: Is that a correct depiction of the status of the well?

THE WITNESS: These are old records and they vary somewhat. Our records indicate, actually, perforations from 3151 to 91.

MR. NUTTER: Fifty-one rather than thirty-one?

THE WITNESS: Yes, sir, and open hole from 3191 to 3395.

MR. NUTTER: In other words, that casing shoe would be at 3191, the bottom of the perforations?

THE WITNESS: Yes, sir, according to our records.

Q (By Mr. Hinkle) Then, in your interpretation of the log of the well or what other means do you have, what

is the top of the Queen?

A The well has not been logged, but based on the structural position in other wells that have been logged, Seven Rivers is open in our well.

I might comment here. I haven't drawn a structure map on the area. However, one was not submitted and it is my -- I, from what I understand now, would say the structural position does not change greatly in between our well and the offsettting tracts.

We are somewhat structurally higher, but not a lot. However, we are perforated higher in the section, perforated up in the Seven Rivers Section.

Q But, you don't know the actual top of the Queen here?

A The well was not logged. As a general rule, their wells were completed from roughly thirty-three hundred to thirty-five hundred feet.

MR. NUTTER: Can you tell, from this driller's log on the formation record, where the top of the Queen would be?

THE WITNESS: Let's see. No, sir, I couldn't. There's also -- based on the total depth of the well, it is

also our conclusion that there is additional Queen pay below TD. If I am not mistaken, I believe Mr. Kelly also said this is a possibility, which is not exposed in our well.

Q (By Mr. Hinkle) You heard the testimony of Mr. Kelly this morning. Do you agree with his testimony that it wouldn't be feasible to use this well, the Stewart A No. 1, as an injection well?

A That it would not be feasible, you say?

Q Yes.

A Well, first of all, I believe he said that they would be willing to use it under terms of negotiations. It is also my contention and my conclusion that it would be feasible to use this well as an injector.

Q Do you agree with his testimony that to him the picture he paints of this well is that you have a very thin oil section and a large gas section?

A I believe I have already testified to this in the fact that my contention being that the gas was being produced from the Seven Rivers and that our oil production was from the Queen and we have other Queen below TD that could be exposed.

Q So, you do not agree with his tesimony?

A That is correct.

Q Now, refer to figure 3 of Exhibit 1.

A Figure 2 of Exhibit 1?

Q Yes; that's right, figure 2 of Exhibit 1.

A Here he shows in green the area that he contends will be swept or flooded to the two producing wells No. 9 and No. 18.

When I evaluated this, I estimated I think this is a real severe estimation of sweep to these two wells based on the offset injection and in this, he estimated that the additional floodable area due to the drilling of No. 14 would be 61 acres.

The area that I calculated, using a less severe sweep and more common practice of figuring sweep area, came out 27.5 acres of additional sweep that the No. 14 Well would contribute.

This would still result in an additional one hundred thousand barrels of recovery due to the drilling of this well based on the 61 acres and two hundred thousand barrels; this is approximately thirty-three hundred barrels per acre that he is saying will be recovered in this area.

Q Do you have any comments with respect to figure

3 of Exhibit 1 that you would like to make?

A I would like to point out here that he points out that the conversion of Stewart A No. 1 would sweep an additional 23 acres. Now, if we also used his figure of thirty-three hundred barrels per acre recovery, then this would be an additional recovery of 75,900 barrels due to the conversion of this well over the conversion of No. 14.

For this to be what I estimated to be incorrect, he would either have to point out that the pay is substantially worse here for some reason or why that they would use a different figure.

Q Now, referring again to Mobil's Exhibit No. 1 and in particular to tract No. 6, in your opinion, is that a comparable situation to the tract of Atlantic Richfield upon which the Stewart A No. 1 is located?

A The tract 6 is also a edge location to the unit as would be our Stewart tract. It is true that the tracts exit undoubtedly down structure of ours, but as previously testified, I don't think structure is significant as to oil production in this general area.

Therefore, I think the tract 6 is similar in the location to ours and I would have anticipated that the

two tracts would be taken in under similar formulas.

It's also true that if you drill an injection well one hundred foot from the line of tract 6, that the incremental barrels of oil that you could then attribute to that tract would be reduced.

Q And correlative rights would not be protected in that instance?

A Yes, had it been left out.

Q Now, as a part of Exhibit No. 4, Mobil's Exhibit No. 4, there is a letter of Atlantic Richfield to Mobil, dated January 2, 1970.

Do you have any comments with respect to that?

A Well, what we stated in here that Mobil's offer was unacceptable to us. They plan here to drill an injection well No. 14 at a cost of $38,000.00 which will recover less oil than would our Stewart A No. 1.

In our letter we state that our calculations indicate that the value of the well bore of our Stewart A No. 1 would be $15,500.00. This is the money that they would save in using our well as an injector opposed to drilling the No. 14 well.

This cost includes setting a liner to shut off the gas zones in the Seven Rivers, perforating that liner and

treating the well. Also, this takes into account -- is discounted $4,500.00 for possible risks, which we think fully discounts the well for risks.

As previously stated, in addition, the well would recover more oil. Mr. Osborne testified to the fact that he said the incremental would be $12,500.00 and, therefore, he put a value on this -- a discounted value on this of $8,330.00.

If you add the $8,300.00, what he said would be the additional value of the oil, to the savings by using this well, you come up with a total worth of the well of $23,830.00. As a compromise price, we said that we would be willing to accept $20,000.00

Q You are still willing to accept that?

A Yes, sir, we are. Our position here being that we would certainly be willing to join the unit under the original perimeters or else we would be willing to take the $20,000.00 cash value, or both of these failing that we would be willing to negotiate an acceptable location for the injection well.

Q Do you have any recommendations to make to the Commission with respect to this matter?

A This previously came to a hearing and the previous

ruling was that this well not be allowed to be drilled. We are still in agreement with the previous ruling and recommend that that be upheld, that the well not be allowed.

Q But, Atlantic Richfield would consider an alternative location for the injection well which would clearly protect your correlative rights; is that right?

A Yes, sir, we would.

Q Do you have any further comments?

A No.

MR. HINKLE: That's all.

CROSS EXAMINATION

BY MR. SPERLING:

Q Mr. Tweed, I believe at the outset, you referred to the Langlie A 1 Well as a producing well.

A It was a producing well. It is now shut in.

Q How long has it been shut in?

A Since 1962.

Q Do you have any information as to the present condition of that well, the well bore?

A As our latest records indicate that it is -- there is no junk in the hole and it is clear to "TD."

Q And there's been no attempt to re-enter to ascertain what the conditions are?

A No, sir, there has not.

Q What do your figures show with reference to the last oil production from the well? Would you agree with the exhibit --

A Yes, we agree with the exhibit, Mr. Sperling.

Q -- which indicates the last oil production to have been 1959?

A Yes. I might add that I don't think this is out of line in that the well was completed in 1938; the last oil production being in 1959, some twenty-one years later, which allowed ample time for the primary depletion of the Queen interval that was open.

Q And I take it that it is still Atlantic's position that the incremental reserves, insofar as the flood is concerned, is 12,500 as previously stated by Mr. Osborne?

A That was previously stated by Mr. Osborne. There is a discrepancy in between what he stated and what Mr. Kelly applies to the area just to the west.

Q Well, I am asking for Atlantic's position with reference to the incremental reserves attributable to the A 1 tract.

A Our position, according to the letter that we wrote, is that we were willing to accept $20,000.00, which

we felt would be consideration for the use of the well bore, plus consideration for the 12,500 barrels of oil.

Q Well, then, the position with reference to the numerical number of barrels incremental remains the same at 12,500?

A That's what we were willing to accept to be contributed for, along with the well bore. I think that Mr. Osborne was conservative in his estimate and probably rightfully so.

He wasn't attempting to be harsh in his evaluation.

Q If you are unable to locate the top of the Queen in the A 1 Well, the Stewart Well, how can you take a position with reference to its position structurally as to wells lying to the west?

A That would just have to be on general structural configuration. As I stated, I did not draw a structural contour map here.

However, one was also not submitted and it was not established that this gas production came from the Queen Formation by Mr. Kelly.

Q You are satisfied that the oil production, the last of which was 1959, did come from the Queen?

A It would be my conclusion that the oil production

did come from the Queen.

Q Now, Mr. Hinkle asked you concerning alternate locations with reference to unit well No. 14.

A Yes, sir.

Q What do you propose as an alternate location?

A Here, for this, we are not trying to dictate to Mobil where they would put their injection well. What we are concerned about is the distance from our producing well and that would be the contention, is the distance from the producing well.

Q Well, I assume from that answer, then, you are suggesting that the injection well be moved to the west; is that right?

A What I mean -- to be completely specific, what I am saying is that if they were at least 660 feet from our well, we wouldn't particularly care where they put it. They could move it to the south or the west, as long as it was on their acreage on the unit.

We wouldn't be opposed, even it was closer than one hundred foot to our line, if it were at least 660 feet from our well.

Q What plans do you have with reference to the Stewart A 1 Well?

A We have no paper works submitted at this time. Obviously because our negotiations are not complete and we are not considered to be complete with Mobil.

In the event that this area is waterflooded and a Mobil injection well is sufficient distance from ours, not to prematurely water it out, we do plan to re-enter it and make a producing well out of our Stewart A No. 1 Well.

Q That would be dependent upon the alternate location, I assume. Is that it?

A Yes, sir. If the injection well is too close to prematurely water us out, it would not be economically feasible for us to re-enter the well.

Q Have you made any estimates on what you would expect to recover by doing whatever is necessary to recondition the A No. 1 Well, the Stewart Well, as a producing well?

A This would be -- we have made estimates. This would be based on the distance from our well as an injection well. Do you have a specific distance in mind?

Q Well, I will take your distance.

A The distance, 660 feet, we estimate a recovery of some twenty to twenty-five thousand barrels of oil.

Q And what do you base that on?

A The area to be swept and the -- based on one to

one primary in the general area. We calculated the primary recovery on a barrels per acre basis in this area, calculated the area that would be swept from that distance and based our secondary recovery on that.

Q Well, assuming the location of injection well to the west, how much unit oil would move to the Stewart Well?

A I wouldn't be in a position to say how much unit oil. Now, if you put it right on the line, there would be no unit oil moved there. It would all be oil that would be swept to -- across our Stewart Lease to our well.

Q Would it be reasonable to say that if an injection well were located 330 feet from the section line, well, the forty line there, to make it 660 feet from your well that any unit oil would be moved in the direction of the Sinclair Well?

A Pardon me. I'm sorry, I missed your question.

Q Well, assuming the location of an injection well at a distance 660 feet from the Stewart Well --

A Yes, sir.

Q -- would any unit oil move to the Stewart Well?

A That would depend upon the location of the well 660 feet from ours. It is true that if it were directly

west, 660 feet, some of the oil that would be produced would be swept from the unit area to our well; not all of it, by any means.

Q Do you think that any oil moved to the east by injection would be lost and not recovered by anyone due to its movement into the gas cap?

A There is going to be some oil moved to the east that will be lost. I would like to refer to our No. 2 well here on Exhibit 1, figure 1. This well will also push oil off of the unit premises to the east, which will not be recovered by any producing well and I think I could cite other instances of injection wells along the unit boundary that would do this and this would also happen on the 14 well.

Q Have you made any study of the wells, nature and characteristic of the wells to the south of the Stewart A Lease as shown on figure 1 of Exhibit A, El Paso Well?

A No, sir, I have not. It's my understanding that is a Jalmat gas well.

Q Do your records indicate the reason for the disconnection of the well in 1964 by El Paso from its gathering system?

A All that was stated here was that the well died and would no longer flow and, therefore, it was disconnected.

Q That was a gas connection, was it not?

A Yes, sir, it was.

Q Mr. Tweed, you stated, I believe, that your estimate of the recovery from the Stewart Well in the event the injection well were at a location 660 feet from the Stewart Well would result in the recovery of about twenty thousand barrels.

What do you estimate the recovery to be from the Stewart Well in the event the injection well were drilled at its proposed location?

A I don't have those figures with me, either the twenty thousand or your present question. Just refiguring in my mind this would result in roughly 6,600 barrels of oil recovered.

Q So, you would have, then, a differential. I believe the present location is some 430 feet from the Stewart Well, proposed location and in a distance of -- that is of comparing 660 feet to 430 feet, approximately thirteen thousand barrels additional oil would be recovered from the Stewart by moving the 14 location to the west.

A Yes. I might point out here that the area is a square function and moving it an additional one hundred foot adds a considerable amount of area, for instance, an

additional hundred foot, since this is a square function.

Q Well, would it be your opinion that the bulk of the additional recovery, that is the difference between 6,600 and the 20,000 would come from the unit area?

A I said here, again -- I said it depends on where the well is located. It also -- if it was located at a different area, it would also increase the sweep on our tract.

If you located it down to the south, as I indicated before on our line or near our line, then essentially all the oil swept on our well would be from our tract.

Q Now, you referred to the tabulation of well information taken from the Hobbs District Office records and particularly with reference to the gas flows indicated, I believe under what bears a numerical notation "9", that would be on the first sheet of that tabulation.

A Is this the scout ticket you are referring to?

Q No. It's the next page and you see the figure "9" over there on the left hand corner.

A OCC work sheet with notes?

Q Yes, sir; right. Now, considering those test figures indicated in there, does that indicate to you that the gas and the oil was coming from the Seven Rivers at the

time of the completion of this well?

A I believe I missed where they set the packer there.

MR. NUTTER: 3-15-'38.

THE WITNESS: They set a packer at 3-15-'38?

MR. NUTTER: On the date, 3-15-'38.

THE WITNESS: Yes, but I missed the depth the packer was set at.

MR. SPERLING: Three ninety-five.

THE WITNESS: That's the TD of the well. If they set the packer in the open hole, I don't believe they would set a packer there.

MR. NUTTER: Now, over here on the scout ticket it says packer at 3,300 on the first page there. Up above there, Mr. Tweed, on the casing record; seven and five-eighths at 961, four and one-half at 3271, 2-inch tubing at 3395, packer set at 3,300.

THE WITNESS: Yes, sir, I see it.

Q (By Mr. Sperling) Does that have any significance, the difference in the gas production and the oil production there, after the packer was set?

A They said here they set the packer at 3,300. I assumed they flowed below the packer at 70 barrels of oil

per day and just enough gas to flow. Is that correct? Is that your interpretation of that?

Q I can't reconcile that with the notation opposite 3-15-'38, which says "set packer." We have to assume it was at 3,300 feet; flowed 70 barrels of oil per day and five million gas through casing.

A There is a discrepancy here in between what it says here and what it says on the scout ticket and I am not prepared to say which is correct, sir.

Q I mean, depending upon which is correct, would that make a difference in your testimony?

A If what is shown on the scout ticket -- well, they showed here a flow of 70 barrels of oil per day through casing.

MR. NUTTER: That's through tubing. On the scout ticket it says "flowed 70 barrels of oil per day through the tubing with just enough gas to flow." So, you have a low ratio there through the tubing coming from below the packer.

You get packer over here and on 3-15-'38 they set the packer; they flowed 70 barrels of oil per day. Well, this is from the scout ticket back over here. But, they made five million through the casing.

So, above the packer, evidently the formation was producing quite a bit of gas.

THE WITNESS: I would assume that, and below that point then would be saying below 3300 foot it was essentially oil bearing formation.

MR. NUTTER: If your casing point is correct at 3191, then you had the difference from 3300 to 3191 of open hole, making that gas?

THE WITNESS: Yes, sir, along with the perforations.

MR. NUTTER: I am not sure those perforations were open at that time; were they?

MR. SPERLING: No.

MR. NUTTER: Those perforations were made over here in 1953, on the next page, item 16?

MR. SPERLING: Correct.

THE WITNESS: Okay.

MR. NUTTER: So, that was open hole above the packer?

THE WITNESS: I might add here also that there was, in testimony Mr. Kelly gave, no mention of the difference in structural position between our Stewart tract and their Mobil tract 10, which I don't have the figures on; but, if they are basing their contention there is gas cap, that is

something that I would like to see figures on.

Q (By Mr. Sperling) I believe you said that you felt a fair allocation insofar as the Stewart is concerned would be on the basis of primary production, some sixty-two thousand barrels of oil.

Do you honestly think that the Stewart, if added to the unit, will contribute sixty-two thousand barrels secondary recovery?

A Yes, sir. I honestly think that it will contribute more than that and there, again, I refer to Exhibit 1, figures 2 and 3, which Mr. Kelly testified to, to the sweep.

If No. 14 is not drilled, then you would have the sweep from our well that No. 14 would get, plus an additional sweep area. Now, it's true in any event on a tract that you are thinking of taking in, if you drill next to the line, you cut down what the tract contributes.

It cost you to drill the well, but if you drill next to the line, you cut down what it contributes.

Q But, you think that the sixty-two thousand contribution to the unit as contrasted to the 12,500 incremental barrels as testified to previously, would be a fair participation basis?

A Yes, the incremental -- we are talking about two different things. I think that the sixty-two thousand barrels is fair representation of what the Stewart A No. 1 will contribute.

Like I just stated, any time you drill a well on the line close to a tract, you cut down how much incremental oil it will contribute to the unit. This is true of any tract in the unit here.

MR. SPERLING: That's all I have.

MR. NUTTER: Are there any other questions of Mr. Tweed?

MR. HINKLE: That's all.

MR. NUTTER: He may be excused.

(Witness excused).

MR. NUTTER: Do you have anything further at this time, Mr. Hinkle?

MR. HINKLE: That's all that we have.

MR. NUTTER: Ask for a statement from anyone else if they have any?

MR. SPERLING: We would like a little more redirect, if we could.

MR. NUTTER: Okay. Fine.

REDIRECT EXAMINATION

BY MR. SPERLING:

Q Mr. Kelly, you are the same Pat Kelly that testified previously in this matter?

A Yes, sir.

Q On redirect, Mr. Kelly, I would like to ask if you have any information as to other Queen completions within the area lying immediately to the east of the Langlie-Mattix Queen Unit Area, that is other than the Stewart A No. 1 Well?

A Yes, sir. There are a number of completions to the east of the unit. The nearest Queen completion, with which I am familiar, directly east of the Stewart A No. 1, is shown on the various plats in Exhibit No. 1 as the Federal A 2 on the El Paso tract and the information that I have is from the production records of the OCC, together with the scout tickets and I believe I have seen a log on that well at sometime.

That well was completed in May, 1959, flowing 18 barrels of oil a day and 350 MCF of gas and produced -- has produced to an ultimate recovery of 2,201 barrels of oil from the Queen.

It, in 1968, made almost fifty-eight million

cubic feet of gas from the Queen and I interpret that as being a gas well. I don't show any -- I do show that it made 95 barrels of liquid. I don't know whether that is oil or condensate.

It evidently was sold off their lease, 95 barrels of petroleum hydrocarbon liquid during the year 1968. To the south on the various plats, that I have offered in Exhibit 1, there are two gas wells shown; one is in Section 14, near the center of the section, Well No. 2, immediately east of unit Well No. 21.

That is a -- I have examined the completion interval and log on that well and I can confirm that it is a lowermost Penrose gas well. It is completed in exactly the same interval for gas production that unit Well No. 21 produced oil from up until it's conversion to injection, which is the bottom porosity in the Queen, the Penrose member and that well, during 1968, produced two million cubic feet of gas with no indication of any liquid produced.

The offset gas well to the east of the Langlie eight two, shown operated by El Paso, is the El Paso Langlie 1 which, according to my information, is a Queen well although I don't know precisely what its completion interval is and during the year 1968 it made a total of 2 barrels of

oil and 17 MCF of gas and its cumulative oil production to the end of 1968 was 1,749 barrels.

With further regard to the area east of the unit, it happens that I do have a log in my hands of a well drilled by Sinclair approximately 660 feet east of the Stewart A 1. It is not spotted on this map.

I understand that it is currently a producing well from the Blinebry-Drinkard, or some such, and I have compared this -- the log of this well with logs of wells down-dip in the unit and I have been able to pick the top of the Queen on it, which is at 3103 feet, log depth.

MR. NUTTER: Top of the Queen is 3103 feet?

THE WITNESS: Three thousand one-hundred three feet. I will offer this log as a further exhibit. I will point out that that the right hand curve on this log is one that I am not acquainted with and I don't claim any expertise in evaluating it.

I can confirm that the gamma ray pick is the top of the Queen and I have compared it with other logs in the area. The right hand curve on this log is some kind of a resistivity log. It's titled "focused log."

I don't know what that is. And the truth is, I couldn't find anyone in our office that works with logs

that could evaluate it for me. One geologist did make some guesses as to what porous sand the resistivity curve indicates is present and for whatever it's worth, there is recorded on the log where those picks were made within the Queen interval and they totaled some 90 feet, including three feet below the gas-oil contact, if you plot it.

I will point once again to the well records that are available to the public on the Stewart A 1. They show a casing shoe at 3,271 feet. Maybe these public records are inaccurate and the casing show is actually at 3191, as Mr. Tweed indicated his records showed.

In either case, I think there's no question but what the well must be in the Queen interval below the casing show. I don't see how there could be that much fall in 660 feet; one location west, that would put this open hole interval up in the Seven Rivers.

I have serious reservations about the perforations being in the Seven Rivers, but without a log on the hole to check it with, I have no way of really knowing. I am of the firm conviction that the open hole interval below the casing shoe indicated to be at 3271 on the records that have been available to me is surely opposite the Queen

interval.

Q (By Mr. Sperling) Is that the extent of the information you have with reference to wells to the east?

A That's all that I have information with me on, I believe.

Q Mr. Kelly, is it your opinion that in the event the proposed unit well No. 14 is not drilled at its location, that there will be lost and unrecovered, with resulting waste, oil in the approximate magnitude of two hundred thousand barrels?

A Yes, sir; that is my opinion.

MR. SPERLING: At this time, I would like to offer Mobil's Exhibit 7.

MR. NUTTER: Mobil's Exhibit 7 will be admitted in evidence.

MR. SPERLING: That's all we have on redirect.

MR. NUTTER: Are there any further questions?

MR. HINKLE: Just one here, Mr. Examiner.

RECROSS EXAMINATION

BY MR. HINKLE:

Q Mr. Kelly, you just testified here to the El Paso 2 A located in the northeast quarter of the northeast

quarter of Section 14, I guess it is.

A Northeast quarter of the southwest quarter of Section 14 is the location that I am looking at, sir.

Q No, the two A. I am talking about the 2 A El Paso.

A Oh, I'm sorry.

Q Directly east of the Stewart A No. 1.

A Yes, sir.

Q Now, what is the structural position of the 2 A Well to the Stewart A No. 1?

A Well, I don't know what structural position the Stewart A No. 1 resides, so I can't describe it in relation to the Stewart A 1.

I seem to remember having picked a subsea datum top of the Queen in that 2 A Well at minus 59 feet. But, I would have to go to my records, which I am not sure whether they are here or in Midland, to confirm that that's where I picked it.

Q Now, in getting up this unit, didn't you prepare a structural map of this whole area?

A No, sir.

Q Never had one?

A No, sir. We had a great deal at stake. We had

a large loan against this property and my aim was to unitize it and place it under flood just as fast as I could. All of the working interest owners within the unitized area were able to come to very rapid agreement, in a matter of an hour or so, on what their interest in this unit should be and we formed it.

Q Well, obviously, 2 A is up structure considerably from the Stewart A No. 1. Is that right -- not right?

A Yes, sir. In preparing for this hearing, I have made some further investigations of wells in the area; yes.

MR. HINKLE: That's all.

MR. NUTTER: Are there any other questions of the witness? He may be excused.

(Witness excused).

MR. NUTTER: Do you have anything further you wish to offer, Mr. Hinkle?

MR. HINKLE: No.

MR. NUTTER: We will take closing statements.

MR. SPERLING: I don't believe I have one.

MR. HINKLE: You fully understand.

MR. SPERLING: I think the Examiner understands

the problem.

MR. HINKLE: I don't think we could add much.

MR. NUTTER: I understand the problem, I don't understand the solution.

If there's nothing further in Case 4202, we will take the case under advisement.

I N D E X

E X H I B I T S

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, GLENDA BURKS, Court Reporter in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Glenda Burks
Notary Public

My Commission Expires:

March 12, 1973

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 4202, heard by me on 1/7, 1970.

Examiner
New Mexico Oil Conservation Commission

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 27, 1969

EXAMINER HEARING

IN THE MATTER OF:	
Application of Mobil Oil Corporation for a unit agreement, Lea County, New Mexico.	Case No. 4201
Application of Mobil Oil Corporation for a waterflood project and unorthodox injection well locations, Lea County, New Mexico.	Case No. 4202

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 4201 and 4202 will be consolidated for the purposes of testimony and separate orders will be written.

MR. HATCH: 4201. Application of Mobil Oil Corporation for a unit agreement, Lea County, New Mexico. And Case 4202, application of Mobil Oil Corporation for a waterflood project and unorthodox injection well locations, Lea County, New Mexico.

MR. UTZ: Appearances?

MR. SPERLING: James E. Sperling, Modrall, Seymour, Sperling, Roehl and Harris, Albuquerque, appearing for the Applicant. We have one witness.

MR. UTZ: Any other appearances?

MR. EATON: Paul W. Eaton, Jr., Hinkle, Bondurant and Christy, Roswell, New Mexico, appearing for Atlantic Richfield Company in Case 4202.

MR. UTZ: Swear the witness, please.

(Witnesses sworn.)

MR. UTZ: You may proceed.

(Whereupon, Applicant's Exhibits 1 through 3 were marked for identification.)

PAT KELLY

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. SPERLING:

Q Please state your name, your place of residence, the name of your employer and the capacity in which you are employed.

A My name is Pat Kelly, I live in Midland, Texas, and I work for Mobil Oil Corporation as a petroleum engineer.

Q Mr. Kelly, have you on any previous occasion testified before the Commission, so that your qualifications as a petroleum engineer are a matter of record?

A No, sir.

Q Would you please give a brief resume of your educational background, leading to an engineering degree, and your experience in this field.

A I studied petroleum engineering at Texas A & M University, and I graduated with a BS degree in petroleum engineering in 1954. I started to work immediately for the railroad commission in its Corpus Christi District Office as a field engineer.

Thereafter, I served two years in the Air Force,

completing that obligation in 1957, when I returned to the railroad commission and was assigned as an engineering examiner, where I served in such capacity for eight years. In 1965, I was employed by Mobil Oil Corporation as a petroleum engineer and have served in that area since that time.

Q Mr. Kelly, are you familiar with the area which is the subject of the application in these matters?

A Yes, sir.

Q And what connection has your association been with the area?

A That of a petroleum engineer?

Q Yes, sir.

A I have had occasion to make some studies of properties, producing properties, in the Queen Formation in that area, which resulted in Mobil's purchase of some properties, which we are preparing to waterflood following their unitization.

Q Would you state briefly what is sought by the application pertinent to Case 4201?

A Pursuant to the application, styled in Case No. 4201, it is Mobil's request that the unit agreement covering the Langlie-Mattix Queen Unit, in Lea County, New

Mexico, be approved.

Q Would you please refer to what has been marked in Case 4201 as Exhibit No. 1 and advise the Examiner what that is?

A Exhibit No. 1 is the unit agreement that has been prepared covering Langlie-Mattix Queen.

Q Now, would you please identify what's been marked in that case as Exhibit No. 2 here?

A Exhibit 2 is an area plant showing the Langlie-Mattix Queen Unit Area in the approximate center of the plat and showing all of the acreage within a two-mile radius of such property.

It also shows the Gulf operated Stewart Langlie-Mattix Unit immediately offsetting the proposed Langlie-Mattix Queen Unit to the north, and it shows also the Langlie-Mattix Woolworth Unit, operated by Amerada for waterflooding in the Queen Formation, about two miles north of the proposed unit.

Q Now, contained within the unit agreement is a map of the unit area; is it not?

A Yes, sir. There is in the back of the unit agreement a plat marked Exhibit A, which shows the location of all the wells in the unit, and shows the unit

boundary, which encompasses some one thousand forty acres or so.

Q Now, is this area or has this area been productive in the particular formation with which we are concerned? By the way, you might explain what the unitized formation is.

A The unitized formation is to be that interval within the Seven Rivers and Queen Formations, described by the Conservation Commission as comprising the Langlie-Mattix Pool.

That interval takes in the lower one hundred feet of the Seven Rivers Formation, together with all of the Queen Formation.

Q Now, please refer to what has been marked as Exhibit No. 3 in Case 4201 --

MR. UTZ: Do you have another copy of the exhibit? Oh, I'm sorry -- go ahead.

THE WITNESS: Exhibit 3 is a log of the Gulf Oil Corporation, J. A. Stewart, Well No. 9, located three hundred and thirty feet from the north and east lines of Section 10, Township 25 South, Range 37 East. That log is marked at the top of the Queen Formation -- top of the

Penrose Formation, which is a part of the Queen, the lower Queen, and is also marked at a depth of one hundred feet above the top of the Queen and it is marked at the base of the Queen, which coincides with the top of the Grayburg.

The entire interval extending from one hundred feet above the top of the Queen down to the base of the Queen is the unitized interval.

Q Mr. Kelly, give us, briefly, a resume of the history of the development within this particular unit area as described in the unit agreement?

A The Langlie-Mattix Pool was discovered sometime in the 1930's. The first production that was found on proposed Langlie-Mattix Queen Unit was the Sun Oil Company Stewart A, Well No. 1, drilled in location B of the Section 15, Township 25, Range 37.

In May, 1936, there were three additional wells completed in the Queen in 1936, fourteen in 1937, five in 1938, two in 1939 and one each in 1947, '66 and '68.

This brings the total development within the unit area to twenty-eight wells. Those wells, for the most part, were completed open hole, with casing set on

top of the pay. In general, they were shot with some nitrogylcerin.

To the end of 1968, the unit area had produced three million two hundred thirty-eight thousand barrels of oil from the Queen Formation.

Q Before continuing with 4202, has the unit agreement, which has been identified as Exhibit No. 1 been submitted to the USGS? I notice that there is federal acreage included within the unit area --

A Yes, sir. Tract 1 operated by Pan-American Petroleum Corporation is a federal tract. The USGS has been consulted in preparation of this agreement and has indicated that it will approve an agreement drawn along the lines of one that has been corrected by them and furnished to us, and this unit has been prepared written along those lines.

And I have confidence that they will approve it.

Q In other words, Exhibit 1 represents a revised unit agreement following its summation to USGS for comment?

A Yes, sir. The first draft was revised according to the comments of the USGS.

Q Now, what percentage of the working interest

does Mobil have within the unit area?

A The unit area is to be operated under the agreement, under a two-phase formula. During phase one, which continues until twenty-three thousand barrels of oil have been produced from and after July 1, 1969, from the unit area.

And phase two begins at the first, on the first day of the month following the exploration of production of twenty-three thousand barrels, and continues thereafter. Phase one is based upon current revenue for the year 1968, for each tract. And phase two is based seven percent on acreage and ninety-three percent on tract accumulated production, as of January 1, 1969.

Mobil's participation, working interest participation, under phase one, is 85.4925 percent and, under phase two, 73.4878 percent.

Q What is the present status of the sign-up of the unit agreement by the various interest owners, both interest owners and royalty interest at this time?

A The unit agreement was only submitted through mail to the working and royalty interest owners on August 13. As of this morning, working interest sign-up,

exclusive of Pan-American Petroleum Corporation, had amounted to 89.4 percent -- weighted according to phase two participation.

Pan-American has furnished Mobil with a letter which states that it has not yet signed the unit agreement, but that it is being processed and that it will be signed, and they authorized us to make that representation to the Commission. With Pan-American's signing the unit will be committed to by ninety-three and a half percent of the working interest owners. As of this time, there are twenty-seven percent of the royalty interest owners which have committed their interest to the unit, according to phase two participation.

Q Do you anticipate any particular problem, other than the lapse of time in completing the execution by the interest owners?

A No, sir. I expect this sign-up to continue at something like the rapid pace that it's progressed at so far.

Q Is the form of the unit agreement, allowing, of course, for certain local variations, a standard form of unit?

A Yes, sir. It's patterned after a federal form.

Q Do you have anything else to add in connection with the unit itself, as contained in the application of 4201?

A I believe not.

MR. SPERLING: I would like to offer at this time, Mr. Examiner, Exhibits 1 through 3 in Case 4201.

MR. UTZ: Without objection, Exhibits 1 through 3 will be entered in the record in this case.

MR. SPERLING: Unless the Examiner wants to inquire as to Case 4201 at this time, we will proceed with that portion of the testimony --

MR. UTZ: The purpose of this unitization is for a secondary recovery; is that correct?

THE WITNESS: Yes, sir.

MR. UTZ: That's all I have.

- - - - -

Q (By Mr. Sperling) Mr. Kelly, with reference to application in 4202, would you state briefly what is sought by that application?

A As a result of the application styled in 4202, Mobil wishes to achieve approval of authority to carry on waterflood operations in the unitized interval beneath

the Langlie-Mattix Queen Unit, using the injection wells which are listed in an attachment which will be made an exhibit in this hearing. And we ask also that the waterflood be operated under Rule 701 E, with regard to the future expansion and allowable.

Q All right. Please refer to what has been marked in 4202 as Exhibit No. 1, which I think is an identical exhibit as Exhibit 2 in 4201.

A Yes, sir; Exhibit 1 is the area plat to a scale of one-inch to four thousand feet. It shows all of the acreage within two-miles of the proposed unit.

Q Now, refer to Exhibit No. 2 and explain what that exhibit shows.

A Exhibit 2 is a map showing the waterflood pattern, which is in the main, an eighty-acre five spot, modified where necessary to conform to the current or planned injections on offset properties, and also, modified to reduce the drilling of additional wells, where possible, to complete the pattern.

Some of the patterns are a little larger than eighty acres. And one or two of them may be a little smaller. In the main, it's an eighty-acre five spot pattern.

The dash lines on the plant, connect wells, which are to be injectors in the waterflood.

Q Now, how many wells are planned as injector wells?

A We plan, ultimately, to utilize seventeen wells for injection.

The wells will include six that will be drilled for injection purposes, and eleven that will be converted. Two of the wells proposed for injectors will not be used initially.

Well No. 30 will be converted to injection after it waters out, down on the south end of the unit, and well No. 14 will be drilled in all probability, in January or February of 1970, to complete the two waterflood patterns that it supports.

Q This will result in how many producing wells within the unit area?

A Ultimately seventeen producing wells. We will have an even number of producers and injectors, a total of thirty-four wells on the unit. They are currently -- the twenty-eight holes that have been drilled on the Queen on the unit.

Q Now then, in connection with the injection wells proposed, please refer to what has been marked as Exhibit 3 and explain what that is.

A Exhibit 3 is a tabulation of the wells that Mobil proposes to use for water injection.

The first tabulation lists those wells that will be converted to injection. They are currently producers, and the second tabulation lists those wells that will be drilled for injection use.

The tabulation shows, in addition to the unit well name, the current name that the wells are operated under. Their location in each section, township and range. And with respect to the wells that will be drilled, the tabulation shows their location, with respect to the nearest section lines, township and range.

There is a discrepancy between the locations shown on Exhibit 3, for three of the wells that are to be drilled, as compared with the similiar tabulations that was submitted within the past week or so, through the mail, to the Oil Conservation Commission.

Those wells are No. 14, 15 and 32. The tabulation, initially furnished the Commission, was in error, with

respect to those well locations. The locations that are shown on Exhibit 3 are the correct locations.

In the case of 14, for example, the surveyor had reported to the individual, transmitting that information to the Commission, a tie on an injection line junction, rather than the well itself. In well No. 15, the surveyor had incorrectly concluded a statement of the locations. The federal authorities would not permit a rig to be raised at the location that I wanted the well at, because it's close to an air strip. We cleared that up with the federal authorities, and have shown on this listing the location that we think will be acceptable to them for a rig to be raised.

With respect to well No. 32, the surveyor learned after the first list was transmitted to the Commission that a surface obstruction would prevent rigging up over the location contained in the tabulation, and the location described on Exhibit 3 for well 32 is one that we can rig up over.

Q Well, then the changes that you have just described result from changes in footages from those previously submitted to the Commission; is that right?

A Yes, sir. There isn't any material difference in the locations that I can see. A few feet in each case.

Q Now, would you give us a brief background of the geologic conditions that prevail in this area with reference to the proposed unitized formation?

A Referring back to Exhibit 1, the area plant, I might point out that the Langlie-Mattix Queen Unit is situated geographically on the west flank of the justice anticline. The crest of the anticline is a short distance east of the unit, approximately one mile, perhaps two miles east of the unit.

The Queen Formation, together with the lower Seven Rivers was contained initially -- contained initially a substantial gas cap which lay on top of an oil column. The gas cap blanketed the crest of the structure and invaded the east side of the Langlie-Mattix Queen Unit.

The oil column lies in a narrow band in this area, about one-mile wide, trending north and south. The injection pattern, that we had planned, that we had put together here, is designed in part to create a barrier, a water barrier, between the oil column and the gas cap, which lies up-dip, to prevent oil from being pushed up into that gas cap, where I am certain it will not be recovered.

Q Have you any other pertinent information as far as the geological conditions are concerned?

A Well, I might point out that the Queen Sand, that we are going to waterflood, is comprised of sand stringers, enters first with dolamite members. Some of these stringers, the sand stringers correlate very well from well to well, where you have logs, but there aren't very many logs in this area.

There are porous members in the lower Seven Rivers. Also, in the upper Queen, and also in the Penrose, that I think contain oil; and I expect to flood concurrently in order to recover some additional oil.

As things stand at this point to production of the unit, it is very near the economic limit, and it is essential that some form of secondary recovery operations be carried on to justify continued operations of the property.

Q Well, in that connection with reference to the production history of this particular area, please refer to what has been marked as Exhibit 4 and indicate what that is designed to show.

A Exhibit No. 4 is a tabulation of production from the unit, oil production. It shows also the number of

producing wells and barrels per day, average barrels per day of oil produced. The tabulation just goes back to 1959. Production did start in 1956 on the unit. Accumulative oil, at the end of each year, is shown alongside the production tabulation, and for the year 1969, production has been set out on a monthly basis, showing that the twenty currently producing wells are making about a barrel and a half of oil a day on an average and during the month of April.

Q Now, concerning your testimony just given with reference to production and the tabulation that you have identified as Exhibit 4, refer to Exhibit 5, which appears to be related, and identify that, please.

A Exhibit 5 is a graphical representation of the same data that is contained, with respect to oil production, on Exhibit 4.

Q Now, would you explain what is contemplated with reference to the installations; the quantity of water that you contemplate injecting, the injection rates, pressures; in other words, a general description of the mechanical installation that you expect to utilize?

A We are intending to obtain supply water from the Grayburg San Andres interval, from a supply well that

will be drilled on the unit in the near future.

This is what is called rough water. It has some H_2S in it. We have an injection station designed to handle that water, and the station will pump at eight hundred pounds surface pressure, 13,500 barrels per day. We won't initially have enough injection wells in service to use all that water. And do intend to inject initially at an average well rate of 750 barrels per day, and intend to restrict the surface injection pressure to one thousand pounds.

I think that we will have very few wells that pressure up within the first year to one thousand pounds. During the second year, I think that injectivity will fall off to perhaps eighty-five percent of the first year, and I expect that we will be able to maintain average injection rates of about five hundred barrels per well per day thereafter.

The station is designed, if necessary, to carry us up to 1800 pounds of surface pressure. I think, in all probability, we won't have to exceed fifteen hundred pounds.

It may be well to point out that the contracts are in the process of being let for the injection station, and I think that construction may well start within the next ten or fifteen days.

Q Now, please refer to what has been marked as Exhibit 6, which is, I believe --

A Exhibit 6 is a log of a well that is not on the Langlie-Mattix Queen Unit; it is on another unit which is the subject of a further hearing this afternoon, the Humphrey Queen Unit. It happens to be the only injection well that we have thus far drilled on either unit, and so, it's the only one that we have a log on.

Marked on that well log, which is identified as our Humphrey Queen Unit No. 20, or the fee name is Liberty Well No. 6.

It was drilled five feet from the west line and one hundred feet from the south line of Section 3, Township 25, Range 37. It shows the entire interval that we expect to be injecting into, which goes from one hundred feet above the top of the Queen, down to the lowermost forced member in the Penrose Section.

Q Well, then, you expect the log which you have just identified as Exhibit 6 to be representative of a typical log of the injection wells which you've proposed, both as they now exist or as they are to be drilled?

A Yes, sir. That log will not show the identical

porosities that we will find in later wells, I'm sure, but it does show the entire interval, and I would class it as a typical injection well.

Q Now, would you please refer to what has been marked, collectively, as Exhibit No. 7, which appears to be diagramatic sketches of completions.

A Exhibit No. 7 is a sheet of well sketches, showing the proposed or existing completion arrangement under injection operations in each case.

The existing wells that will be converted are, for the most part, going to be completed in open hole, as they are now, with a tension packer set a short distance above the casing chute; with injection to take place through cement lined tubing. The casing anulus, in each case, will be loaded with treated water to inhibit corrosion.

The wells that we are going to drill, which on the -- Langlie Unit, No. 6, will all be completed through perforation; they will be cased through the pay, and the porous members, and the porous members selectively perforated, and cement lined tubing set on a packer, above the uppermost perforation and with the casing also loaded with treated water.

The casing in each case, both the surface pipe and the long string will be cemented back to the surface.

Q Any other features you would like to mention with reference to the method of completion of these wells?

A I can't think of anything else. I believe the completion method that we propose will confine the injected water to the pay.

I don't invision there being any likelihood of its escaping to a fresh water zone and to the surface under this arrangement.

MR. SPERLING: That's all we have, Mr. Examiner.

CROSS EXAMINATION

BY MR. UTZ:

Q Now, in regard to Exhibit No. 7, Mr. Kelly, did you state whether or not the tubing would be plastic coated?

A The tubing will be cement lined, as will all of the surface injection lines.

Q And are you going to load the anulus --

A With treated water; yes, sir.

Q What are you going to do with the surface of the anulus?

A It is the practice of Mobil to periodically check the casing anulus for the presence of any pressure, and, of course, when it's demonstrated, why, we know we

have got a leak somewhere and set about to correct it.

Q Well, do you leave it open or --

A There will be a valve on it. I don't know whether there will be a gauge on it or not. A lot of times a pumper will carry a gauge around in his pickup, and just screw it into a valve -- if a well won't bleed down immediately, well he opens it up.

MR. UTZ: Any other questions?

CROSS EXAMINATION

BY MR. EATON:

Q Mr. Kelly, with reference to Exhibit 3, what is the distance of unit well number 14 from the north line of Section 14?

A Unit Well No. 14 is to be 660 feet south of the north line of Section 14.

Q Thank you. As you inject water into the formation, what physically happens?

A I think the water enters the porous member, the porous and permeable members, and expands out according to injection within those members.

Q Does it tend to expand out radially?

A Theoretically, it does. It doesn't always, but we make that assumption, usually. It depends on the permeability orientation. I haven't any reason to think

that the water will not expand radially around the wells.

Q Is there any pressure effect that is set up in the formation with the water moving out through the formation?

A The injection of water into a reservoir rock takes place because of a pressure differential, yes, sir. There is a pressure differential from the well bore to the front of the -- flood front; the bleeding edge of the flood front.

Q Then what happens when water from two injected wells, moving toward each other -- what happens when the water meets?

A It goes to the direction of the least pressure.

Q I believe you testified that Well No. 14 will probably be drilled in January or February of 1970?

A Yes, sir.

Q Why do you propose to drill that well at that time?

A The main reason that I have proposed to delay drilling of that well -- to the first part of next year, is to allow sufficient time for Atlantic, if it so chooses, to accept the offer that Mobil has made to it for the currently abandoned or temporarily abandoned well, offsetting proposed well number 14 to the northeast on the Stewart A lease -- because I believe I can tolerate that much delay.

I can tolerate two or three months delay in getting that well on injection, but I can't tolerate anymore than that.

Q Now, do you think that well number 14 is -- is that an ideal location for an effective waterflood sweep?

A No, sir. I don't think it's an ideal location. It's the best location I could find on the unit, on the east side. I don't think there is a better location anywhere on the unit.

Q On the unit?

A Yes.

Q Would you feel that perhaps a location on the Stewart lease may be better than the present well 14 location?

A I think that's highly debatable. The location of what was formerly Sinclair's, and is now Atlantic's Stewart A No. 1, would lend itself to use as an injector and might result in some additional recovery, although it's my opinion that the magnitude of the additional recovery would be of a low order.

The principal benefits that could be derived out of injecting into the Stewart A No. 1, rather than the well number 14, would arise out of the elimination of the need to spend money drilling a well.

Q How about much money does it cost to drill one of the injection wells?

A We have estimated the cost at $38,000 per well, to drill and complete through perforations.

Q How much do you think it will cost to enter, for example, the Stewart No. 1 well and prepare it for injection?

A I have not prepared an estimate of the cost of doing that work to Stewart A Well No. 1. If I were able to make the assumption that we would encounter no trouble, that the well doesn't have a casing leak or a collapsed casing or -- I should think that we would be able to complete it for injection for somewhere in the neighborhood of ten to thirteen thousand dollars.

Of course, that would be an open hole completion. We wouldn't set a liner with that. And there would be -- well, there is a factor to consider and it is how well you can control where the water goes. You have almost no control in an open hole interval, but you can mechanically control the water -- where the water goes when you have your pipe perforations.

Q Now, if you do go ahead and drill well number 14 in five or six or seven months, and start injecting at that time, I assume that well number 13 will have been in

operation for a while before that time?

A My estimate right now is that by the time we get well number 14 drilled and completed, well number 13 will probably have been on injection for about two and a half to three months.

Q Mr. Kelly, I would assume then that when you start injecting water into well number 14, that there would be a tendency for water to move somewhat rapidly eastward?

A Probably so. I think it would move rapidly in all directions, really. But the area to the east, I am sure, has a higher gas saturation than the area to the west. And I think that it will probably have a higher permeability to water than to the area to the west, and it's also true that the water would probably move a little faster to the east than it does to the west.

Q Also, you would have the pressure problems to the west because of the injection in the well number 13?

A I am almost certain that there would have been no interference within a three month period.

Q Well, at such time as the water injected in number 14, moving westwardly met the well, the water injected in well 13, then there would be a tendency for the well number 14 water to move more easily to the east,

rather than continue westwardly at the same rate?

A If I can make the assumption that the permeability of the rock stays the same, I think that's true.

Q Well, at the outset, I think you said that's true?

A Yes, sir. I think so. It depends on the pressure differential, if we run into a hard streak out there, it will slow down.

Q Do you have any idea as to how soon you think the Stewart A well would be watered out after you started injecting in the well number 14?

A No, sir. I haven't formed an estimate of that. I do know that the Stewart A No. 1 is approximately the same distance from our proposed injector number 14, as our wells, our unit wells number one and eight are from Gulf's Stewart Langlie-Mattix No. 28, which has been on injection December of 1968.

And as far as I can tell, we have seen no effect from that injection as yet in those wells. But, of course, I think there is a high oil saturation down here, and the water would tend to move slower through the area of high oil saturation than it would through an area of high gas saturation, I think.

MR. EATON: That's all I have.

REDIRECT EXAMINATION

BY MR. SPERLING:

Q I have another question or two on redirect. Mr. Kelly, what is the present status of the Atlantic A 1 Stewart?

A The best information that I have, is that it is temporarily abandoned or shut-in. Information in this line has been communicated to me, verbally, by some of the people that were formerly interested in the well in Sinclair.

Q Do you know how long it has been temporarily abandoned?

A Well, I have -- I'm not sure that it has been temporarily abandoned all that time, but the production records don't show any production for it since 1963.

It began production in 1938, and through 1953, it made 61,047 barrels of oil. It shows no production for the years 1954 through 1957.

It shows 917 barrles of oil in 1968. A 116 barrels of oil in 1959, along with 37,720,000 cubic feet of gas.

And it shows on the gas production for 1960 through 1963. Since that time, there hasn't been any

production recorded in the publication for the well. I assume it's been shut-in. It may have been plugged -- I don't really know. I doubt if it's been plugged, I think it's been, just been shut-in.

Q Do you have any information as to the condition of that well?

A I have the information that was reported on the scout ticket, at the time of its completion. I have some other information that has been gleaned from O. C. C. Miles in Hobbs. I do not have information indicating what the situation is in the well bore at this time.

MR. SPERLING: I believe that's all.

RECROSS EXAMINATION

BY MR. UTZ:

Q Mr. Kelly, have you been in contact with Atlantic Richfield regarding the oil in this unit?

A No, sir.

Q Would you be willing or would Mobil be willing to accept the unit?

A Well, of course, Mobil is one of the working interest owners, and the working interest owners collectively make those decisions. From my own standpoint, I would have

no objection to the lease being brought into the unit on an equitable basis. And if we had been or should be successful in purchasing the lease, well it would be our intention, if we are able to unitize the royalty to negotiate it into the unit on an equitable basis.

Q By equitable basis, you mean on the same basis that the rest of it had been agreed upon?

A No, sir. I don't think that basis would afford protection to the remaining interest in the unit. I think if the lease were to participate on the same basis that the other interest would be watered down to an unwarranted degree.

The phase two participation of the well, the tract would approach two percent on the basis of the rest of the properties. When you look at the location of the well, you can see that it's as far down dip as the -- as a regular location can be drilled on the lease. As is, the adjoining well to the west is as far down dip as the location can be drilled on the lease, a regular location.

I am confident that a good quantity of the oil that has been produced from the Stewart A No. 1 has come from the adjoining area to the west. Any regular drainage pattern would lead you to that conclusion.

I think the amount of oil that the lease would contribute to the unit is -- is somewhere in the neighborhood of one-fifth to one-seventh of the amount of oil that the tract would be credited with if it were to participate under the same phase two formula that the rest of the tracts had come in under. I think this is because the lease hasn't made any oil in a long time. The well is very close to the lease line.

There just isn't any acre feet there to sweep. And those that are are characterized by high gas saturation, and I would expect the waterflood recovery out of those acre feet, the farther up you go to be of a lower order.

Q I understood you to say that the Justice Anticline was a gas cap; is that correct?

A Yes, sir. There was and is a gas cap in the Queen Formation on top of the structure.

Q And that the gas cap has encroached to the west onto your proposed Langlie-Mattix Queen Unit?

A I am not certain that it has encroached. I am certain that it has always been there. It may have progressed down dip to some degree -- to some degree, it surely has. I'm not prepared to say how much.

Q Well, you know, from your study of this area, do you know of any wells on the eastern edge of your proposed unit that has shifted from oil to gas?

A No, sir.

Q Vice-versa?

A From gas to oil?

Q Yes.

A No, sir. One of the wells, the Pan-American Langlie B, No. 3, which is to the unit injector number 27 was initially completed as a gas well in the upper Queen. We intend to deepen that well to expose the oil saturation porosity that lies below and inject it -- assuming we find some oil saturated porosity below.

In like manner, the offsetting well to the south, the Cities Service, Dabs No. 1, penetrate only the upper part of the Queen and was completed open hole from somewhere above the Yates down into the upper part of the Queen and is produced as a gas well throughout its life.

I have an idea its production has come from the Yates. That's where it's been reported at least, and I am skeptical about the amount of fluid that entered the well out of the Queen Formation. I don't think it had much of it open.

Q Well, it would appear then, from your testimony, that the gas-oil contact on that has been relatively stationary?

A I don't intend to represent that it has or has not.

Q The purpose of your number 14 injector, would it be a fair statement to say that it is to push oil to the west, rather than to push some of your unit oil to the east, since you would be putting the second injection well in the same forty-acre tract?

A It is to prevent oil -- pushing oil off of the unit to the east up into what I interpreted as being a gas cap, with a high gas saturation. Where I am sure that little or none of it would ever be recovered.

It is intended to force oil to the producer which will be in the center of the pattern to the northwest and to the producer that will be in the pattern to the southwest.

Q If you are going to use a number 14, do you think the number 13 is necessary?

A Yes, sir. I've got to flood the adjoining pattern to the west, the 14 -- I don't believe I will ever get enough water into it to flood the pattern to the west or

provide an efficient sweep from any of the patterns that surround it.

MR. UTZ: Any further questions?

MR. HATCH: You have three production wells to be drilled and those were not included in this application?

THE WITNESS: No, sir. I have shown the locations that we intend to drill the wells at.

MR. UTZ: Were those standard locations?

THE WITNESS: No, sir. Twenty-six will be right on the section line. The others will be regular locations, unorthodox as to density.

MR. UTZ: You didn't request those; did you?

THE WITNESS: No, sir.

MR. UTZ: Any other questions? The witness may be excused. Statements?

Oh, did you have some more questions?

MR. SPERLING: Yes, and I wanted to offer my exhibits, Mr. Examiner, 1 through 7.

REDIRECT EXAMINATION

BY MR. SPERLING:

Q Mr. Kelly, do you think the approval of the unit agreement and the flood program which you have outlined here would be in the interest of the prevention of

waste and the protection of correlative rights in this unit area?

A Yes, sir.

Q I have the impression, Mr. Kelly, from your outlining of your program that there is a matter of some urgency in connection with the initiation of this flood; is that correct?

A Yes, sir.

Q Can you tell us why?

A We have -- we bought the properties that Mobil will contribute to this unit and also to the other unit, from George Buckles, on May 1. The commitments that we have made in connection with that purchase make it mandatory that we move very rapidly to the secondary recovery operation in the interest of preventing the loss of funds.

And accordingly, we have spared no effort to get this operation under way -- we have taken a lot of risk and carrying a lot of burden by ourselves until we could get an agreement from other parties.

And to that extent, it's very important that we start injection just as soon as we possibly can.

MR. SPERLING: Thank you. That's all I have. I did offer Exhibits 1 through 7, I believe?

THE REPORTER: Yes.

MR. UTZ: Without objection Exhibits 1 through 7 will be entered into the record of this case. And let's take a coffee break.

(Whereupon, a brief recess was taken.)

MICHAEL OSBORNE

the witness, called by Mr. Eaton, having first been duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. EATON:

Q. Will you please state your name, residence, occupation, and your employer?

A. My name is Michael Osborne, and I reside in Roswell, New Mexico. I am employed by Atlantic Richfield Company as an operations engineer.

Q. What is an operations engineers?

A. We work with production engineering -- petroleum engineering.

Q. Have you previously testified before the New Mexico Oil Conservation Commission as a petroleum engineer?

A. Yes, I have.

Q. Were your qualifications accepted at that time?

A. Yes, they were.

Q. Mr. Osborne, to make this as brief as possible, would you just give me Atlantic Richfield's position with respect to the application of Mobil in Case 4202?

A. Well, I am here on behalf of Atlantic Richfield Company today to oppose Mobil's proposal to drill an

unorthordox injection well, located six hundred and sixty feet to the north line and twelve hundred and twenty feet from the west line of Section 14, Township 25 South, Range 37 East.

This has been designated by Mobil, in their Unit, as Unit Well Number Fourteen, which, it has been previously testified, that they intend to drill in January or February of next year.

It is the belief of Atlantic Richfield that this well would rapidly water out the Atlantic Stuart A on Well Number One, located three hundred thirty feet from the north line and sixteen hundred and fifty feet from the west line of that same Section 14.

We feel that the Mobil Number Fourteen would water this well out, so rapidly that it would not make it economical for us to set a pumping unit on this well, which we have had shut in since 1963, saving it for secondary recovery in the area.

We feel that we would like our well included in the unit as an alternate to the Mobil Unit Well Number Fourteen. We feel the use of our well leads to a more efficient sweep of the Queen in this area and we believe that it would lead to the additional recovery of

approximately twelve thousand five hundred barrels of oil, over that which would be recovered by Mobil's Unit Well Fourteen.

Q. Is Atlantic willing to join the Mobil Unit?

A. Yes -- Atlantic has expressed an interest, at least orally, to Mobil, that we would like to be considered in their unit.

We have at this time, however, received no unit plans or economics or anything from them concerning this.

Q. Would Atlantic be willing to sell its well to Mobil if the parties could agree upon the proper parts?

A. Yes, we feel that if we could reach a reasonable price for the well, that we would be willing to sell it to Mobil.

Q. Is it Atlantic's position at this time that the location of Well Number Fourteen will not be in the interest of conservation and tend to cause waste and infringe upon the correlative rights?

A. This is our belief. The Atlantic Stuart Well, in primary production, recovered slightly over sixty-two thousand barrels of oil.

It is true that this area, under the Atlantic Reese Lease is an area of high gas saturation. However, we do feel

that there are still commercial reserves that could be recovered by conversion of our well to an injector as opposed to the use of Mobil's Unit Well Number Fourteen.

Q. Do you have anything else which you would like to add?

A. No, sir.

MR. EATON: That's all, Mr. Examiner.

CROSS EXAMINATION

BY MR. UTZ:

Q. You don't have any idea then what kind of deal you might be willing to accept as far as on this well as far as joint community is concerned? Not until you see the economics?

A. We feel that we would like to negotiate it further. We have established a price of approximately twenty-five thousand dollars, that we would be willing to sell the well for, and we feel that this is reasonable, in light of the fact that it would add additional reserves to the unit.

However, as far as percentage of the unit, should we be offered a chance to join, we cannot say at this time, because, as I say, we have not seen the study on this flood yet.

Q. Twenty-five thousand dollars would include the production under the lease; would it not?

A. Yes.

MR. UTZ: Any further questions?

CROSS EXAMINATION

BY MR. SPERLING:

Q. Yes, sir. Mr. Osborne, on what do you base your estimate as to incremental oil of twelve thousand five hundred barrels?

A. Well, I base this on the additional area of the sweep that could be obtained by using the Atlantic Well, as opposed to Unit Well Number Fourteen.

Q. Have you made any calculations as to oil in place of -- to support that figure?

A. I base this roughly on primary production, which generally is a good indicator of secondary recovery in this area.

Q. Do you have an opinion as to the source of the primary production?

A. We feel that the primary production was coming from the lower Queen stringers.

Q. Horizontally? The source?

A. I would say, primarily from the east -- no, from

the west, excuse me. Although I cannot say that all of it came from this direction, I feel that some of it was obtained from the east side of the Stuart Well Number One. Assuming, of course, that all of the production did come from the west side of the Atlantic Stuart Well Number One, this would tend to increase the recovery that we could attribute to any area swept to the west, since this is where the primary oil came from, this is the area we are going to sweep and recover oil from the secondary.

Q. Do you know whether or not, Mr. Osborne, there had been negotiations with reference to the sale and purchase of it?

A. Yes, there have been in the past -- well, just very recently, we received an offer from Mobil to purchase our well for twelve thousand dollars. This was an alternate suggestion that they had at that time -- they had planned to drill two injection wells in the south-- in the, well, just one hundred feet off of the northwest, and southwest corners of our lease. And they were requesting that we participate in the drilling of these two wells to the extent of approximately nineteen thousand dollars.

We did not feel that this would be in our best interests, because we would have been faced with the same

problem that we are now, except that instead of having Unit Well Number Fourteen where it is, it would be moved to approximately the same location north and west of our well.

And as an alternative, they suggested they would offer us twelve thousand dollars.

Q. Well, then negotiations have been in progress and are not necessarily concluded?

A. No, they are not.

Q. Well, what is your degree of confidence in the figure of twelve thousand five hundred, based upon the information you have, which I have understood was primarily on a primary production? In other words, do you think this is a pretty exact figure or what?

A. Well, the experience that I've had and the other people in Atlantic with me, I'm sure all of us can say that it's difficult to pin reserves down on this basis, that for a large unit area -- they hold fairly true -- a certain percent of primary oil will be produced in secondary. I would say in this case, reserves could possibly range from anywhere from, say, eight thousand barrels up to around sixteen thousand barrels. I strike a figure of twelve thousand five hundred as being sort of a medium point.

Q. Now, do I understand that that is the suggested figure as the basis for the calculation and participation in the unit; that that figure would be used?

A. I think something roughly around this -- I cannot say at this time.

MR. SPERLING: That's all, thank you.

RECROSS EXAMINATION

BY MR. UTZ:

Q. This well is not now producing; is it?

A. No, it is not. It has been shut in since 1963.

Q. Well, when it produced the sixty-two thousand barrels accumulative, was it flowing?

A. It was flowing, yes.

Q. And it produced that with a high gas-oil ratio, I presume?

A. Yes, it did.

Q. Any idea of the amount of pressure; the bottom hole pressure now?

A. No, I do not have any idea.

Q. You have no idea?

A. No.

MR. UTZ: Any other questions? The witness may be excused. Any other testimony?

MR. SPERLING: Mr. Examiner, for convenience and reference, and we have referred to this earlier -- we have a tabulation of production by year, from the Atlantic Stuart A, Well Number One, that would be of assistance, and we would like to submit it as an exhibit.

MR. UTZ: All right.

MR. SPERLING: Will you mark this as Exhibit Eight in Case 4202.

THE REPORTER: Yes, sir.

(Whereupon, the instrument was marked for identification as Applicant's Exhibit Number 8.)

MR. HATCH: I assume that the Commission will be notified as to the agreement that will be made --

MR. SPERLING: Yes, sir.

MR. UTZ: Mr. Sperling, you are requesting, in this order, administrative approval for further injection wells; are you not?

MR. SPERLING: Yes, sir.

MR. UTZ: Anything further in this case? The case will be taken under advisement.

(Whereupon, Exhibits 1 through 8 were admitted into evidence.)

INDEX

EXHIBITS

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, CA FENLEY, Court Reporter in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported to me, and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Wintess my Hand and Seal this 14th day of November, 1969.

COURT REPORTER

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 4202 heard by me on [illegible] 1969.

[illegible], Examiner
New Mexico Oil Conservation Commission