BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 28, 1959

EXAMINER HEARING

IN THE MATTER OF:

Case 1728

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IN THE MATTER OF:

Application of Hanson, Waters and Williamson, for an order authorizing a pilot water flood project, for capacity allowable for twelve wells in said project area, and for establishment of an administrative procedure for expansion of said project, conversion of wells to water injection, and for granting capacity allowables. Applicant, in the above-styled cause, seeks an order authorizing it to institute a pilot water flood project in the Coyote-Queen Pool in Chaves County, New Mexico. Applicant proposes to inject water into the Queen formation through six wells located in Sections 15 and 16, Township 11 South, Range 27 East. Applicant also seeks capacity allowables for twelve wells in said project. Applicant further seeks the establishment of a procedure whereby the project area may be expanded, wells may be converted to water injection, and capacity allowables granted without notice and hearing. Case 1728

BEFORE:

Mr. Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The next case is 1728.

MR. PAYNE: Case 1728. "Application of Hanson, Waters and Williamson, for an order authorizing a pilot water flood project, for capacity allowable for twelve wells in said project

area, and for establishment of an administrative procedure for expansion of said project, conversion of wells to water injection, and for granting capacity allowables."

MR. KELLAHIN: If the Commission please, Jason Kellahin, Kellahin & Fox, Santa Fe, New Mexico, representing the applicant. We have two witnesses, Mr. Russell and Mr. Williamson.

(Witnesses sworn.)

MR. KELLAHIN: We call as our first witness, Mr. Russell.

MR. UTZ: Any other appearances to be made in this case?

MR. RUSSELL: If the Commission please, John F. Russell of Campbell and Russell, making appearance on behalf of the Pecos Valley Artesian Conservancy District.

MR. KELLAHIN: May I inquire as to the interest of the Pecos Valley Artesian Conservancy District? It is my understanding that the area involved in the application lies outside of the district.

MR. PAYNE: Do you care to state for the record, Mr. Russell, what the interest of the Pecos Valley Artesian Conservancy District is?

MR. RUSSELL: We wanted to find out what we can as to the proposed operation in order to determine whether or not it would affect the waters of the Roswell Basin.

MR. PAYNE: You do not intend to present testimony?

MR. RUSSELL: I'm not going to present any testimony.

MR. KELLAHIN: We have no objection to your appearance. I wanted to clarify the record on it.

MR. UTZ: You may proceed.

JAMES E. RUSSELL

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q State your name, please. A James E. Russell.

Q What business are you engaged in, Mr. Russell?

A I own a consulting engineering firm in Abilene, Texas.

Q Have you ever testified before the Oil Conservation Commission?

A No, sir, I have not.

Q For the benefit of the Commission, would you outline your education and experience as a petroleum engineer?

A I was graduated from the University of Kansas in 1941 with a degree in petroleum engineering. I have operated as a consulting petroleum engineer since 1951. I have had approximately fifteen years' experience in water flood engineering and operation.

Q Where was this experience acquired?

A In New Mexico, Texas, Kansas and Oklahoma.

Q Are you the head of the Russell Engineering Firm?

A Yes, sir, that is correct.

Q How many employees do you have, Mr. Russell?

A Sixteen at the present time.

Q Are they under your supervision?

A That is correct.

Q In connection with your work as a consulting engineer, have you studied the area involved in this application in the Coyote-Queen Oil Pool?

A Yes, sir, we have studied it.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. UTZ: Yes, sir, they are.

Q Are you familiar with the application that is before the Commission in this case, Mr. Russell?

A I am.

Q Have you prepared a report involving the feasibility of the water flood project?

A We have prepared a fairly detailed report concerning the feasibility of this project, yes, sir.

MR. KELLAHIN: We have some exhibits. Would the Commission like to have them all marked?

MR. UTZ: Yes, sir, they would.

A These exhibits are attached to the back part of this.

(Thereupon the documents above referred to were marked Applicant's Exhibits Nos. 1 through 6, for identification.)

Q Do you want to get the exhibits marked too?

A These exhibits are logs in the vicinity of the pilot flood. Hanson State "A" No. 1. Hanson State "A" No. 2.

MR. UTZ: This will be Exhibit No. 2.

A That will be fine.

MR. UTZ: Exhibit 3.

A Yes, sir. State "C" No. 1.

MR. UTZ: Exhibit No. 4.

A Yes, sir. State "C" No. 2.

MR. UTZ: Exhibit No. 5.

A Yes, sir. This is a log of the proposed water supply well.

MR. UTZ: Exhibit No. 6.

Q (By Mr. Kellahin) Now, Mr. Russell, referring to what has been marked as Exhibit No. 1 and the first plat which appears as an attachment to that exhibit, would you discuss that, please?

A This plat shows the proposed pilot flood area, the lease involved, owned and operated by Hanson, Waters and Williamson, and designation of various offset operators.

Q Does the plat show the pilot area involved?

A The plat does show the pilot area.

Q Does it show the location of the proposed wells in the area?

A Yes, it does.

Q Have these injection wells been drilled as yet?

A The injection wells have not been drilled.

Q From what formation is the Coyote-Queen Oil Pool producing?

A It is producing from the Queen.

Q At what depth is that found?

A The top of the Queen pay zone in this area is approximately 835 feet below the surface.

Q Have you prepared a structure map at the top of the Queen?

A Yes, the second plat shows a contour map on top of the Queen zone.

Q Does that contour map indicate that the Queen zone is a continuous formation through the area?

A It appears to be from this exhibit and from our studies.

Q What is the basis of your controls for that plat?

A All the wells that have been drilled in the area.

Q Have any gamma ray logs been run on any of these wells?

A Yes, sir. Gamma ray and acoustic logs have been run on all the wells to my knowledge in the area.

Q Would you expect that future wells in the pilot area

would vary to any considerable degree from those that have been, that have already been drilled?

A No. I think the drilling to date fairly defines the productive area and future wells drilled in the area should not vary too much from those already drilled.

Q Directing your attention to the pilot area, will you discuss what is proposed to be done there?

A In the pilot area there will be six new injection wells drilled on a proposed 20 acre five spot unit basis. In addition to that, one additional producing well must be drilled at the location shown as P-6 on the Levick State "C" Lease. Additional producing wells outside of the direct pilot area, or outside the wells that will be completely closed by the injection wells, are P-9 and P-7 and P-8 on the Levick State "C", which will comprise a total of six injection wells and eight producing wells to be directly affected by the pilot flood.

Q In referring to your plat attached to Exhibit No. 1 showing the pilot area, how are the injection wells designated and how are the proposed producing wells designated on that plat?

A The injection wells are designated as W-100, W-101, W-102, W-103, W-104. All wells located on the Levick State "C" Well and one injection well on the Hanson State "A" are designated as W-100.

Q How are the producing wells designated?

A The producing wells are designated as P-6, P-7, P-8, P-9 on the Levick State "C" Lease.

Q You also have some on the Hanson State "A" Lease, do you not?

A We have two wells already completed on the Hanson State "A" Lease, Hanson State "A" 1 and 2.

Q That completes for the pilot area the proposed wells?

A Well, we do have two wells already completed on the Levick State "C" Lease designated hereon as 1 and 2.

Q That concludes all the wells then in the pilot area?

A In the pilot area.

Q What is the distance between the injection wells and the producing wells?

A The distance between like wells, in other words, from injection well to injection well is 933 feet, and the same distance would apply between the producing wells.

Q That would result in a 20 acre spacing, would it not?

A That is right.

Q It would be a five spot location?

A Five spot locations.

Q What is your proposed completion procedure?

A It is proposed to drill with rotary through the pay section, set four and a half inch nine point five pound continuous well casing through the pay zone, which will be approximately

900 feet, and perforate the pay sections, approximately four shots per foot of pay. The casing will be cemented to the surface.

Q Will a test be run on the casing prior to --

A Yes, a test will be run on the casing to assure it is properly completed.

Q In your opinion does that casing program adequately protect surface water?

A Yes, in my opinion the circulation of the cement to the surface should adequately protect the surface water.

Q What kind of perforations do you propose to make?

A At the present time it is our plan to perforate the pay zone, which is actually comprised of five separate permeable zones with four shots per foot of pay section.

Q Do you plan to fract?

A Yes. If these wells need fracting it probably will be done with about 250 pounds of sand per foot.

Q What is your source of water for the project, Mr. Russell?

A At the present time an old well drilled as a DeKalb Compton State No. 1 in the Northeast corner of Section 15 is being entered and recompleted as a possible source of water for this operation. The pay or the water shown will be the Glorietta formation, and will be according to our Exhibit No. 6, the water will be secured from a depth of approximately 2570 feet

to over a zone of about 100 feet in thickness.

Q Has that well yet been completed for water production?

A It has not been completed for water production. However, casing is set in the well at approximately 1370 feet, I believe.

Q Do you know whether work is now being done on the well to complete it for water production?

A Yes, sir, the operators are presently completing this well for testing purposes to see if adequate water is available from the Glorietta horizon.

Q At this time do you have any information on the analysis of the water from the Glorietta formation?

A We, at this time, do not have a complete nor detailed analysis of the water other than by analogy from other Glorietta waters that it is a brine. The water samples that have been obtained have been too badly contaminated for analysis purposes. We are unable at this time to submit an analysis of the water.

Q Are you willing to submit to this Commission and to the State Engineer or any other interested parties the analysis of the water when it is available?

A Yes, sir.

Q Would you discuss the fluid characteristics in the Coyote-Queen reservoir?

A All the wells in this reservoir drilled by Hanson,

Waters and Williamson have been cored, analysis of the cores indicate an average porosity of 11.9% and average horizontal permeability of 16 millidarcys.

Q How many cores were available for that study?

A Twelve cores.

Q What did you find in the way of connate water saturation?

A Based on laboratory tests where the core samples were dynamically flooded with oil in the lab, the average connate water saturation as it is a function of permeability is 32.3% of the pore space.

Q What is the average residual oil saturation after the sweep of the reservoir rock?

A From our lab determinations it is 24%.

Q Do you have any stock tank analysis of the oil?

A Yes, a test of a stock tank sample was 39.7 degrees API at 60 degrees, and 4.34 centipoises viscosity at 80 degrees, which is the estimated reservoir temperature.

Q Do you have any information on the production history of the area?

A Yes. Two or three wells have been produced in this general area over the period of the last year and a half or so; shown as an attachment to this Exhibit 1 are two production curves on a George Williamson, a well drilled by George Williamson.

Q It is George Williams, is it not?

A I am sorry, George Williams. No. 1-T Levick State "A" Lease in the Northwest Quarter of Section 21, we have presented a production curve of this well. The average production since the beginning of 1958, has shown a rapid decline, and at last reports that were available to us, the well was producing somewhere in the vicinity of about 50 barrels a month.

A similar decline in production history is shown for the M. G. Peters 80 acre tract just to the north of the Williams Well, and shows a similar production history. These wells are presently producing at submarginal levels.

All of the wells drilled to date by Hanson, Waters and Williamson are relatively new and very little production history is available on those wells at this time.

Q Is the average rate of production on the wells in the pool submarginal?

A On those wells with which we have any adequate production history at all, it is indicated that they are at a submarginal level and will produce at that level during their primary life. It is our testimony, or it's my opinion that these wells drilled to date by Hanson, Waters and Williamson also will be submarginal wells within a short period of time.

Q Do you have any production history on the Levick State "B" Lease?

A Yes. At the present time that is the only production history that we have which covers a period of four months, in 1959 March, April, May and June. The cumulative production from that lease has been 3562 barrels.

Q There has been a wide fluctuation in the production from month to month, has there not?

A Yes, there has.

Q How do you account for that?

A In March, which is the first month any production was reported from the well, no doubt was a short production month. Some of this oil has been used for fracting additional wells. However, the producing capacity of this well has shown a tendency for declining in its rate of production.

Q What do you anticipate your water requirements will be for the pilot project area?

A Based on injectivity calculations using permeability as a perimeter and what we consider to be a maximum injection pressure that can be used in this reservoir, we estimate that about 4.5 barrels per day per foot of sand would be the maximum injection rate. Based on the six wells proposed for this pilot flood and 42 feet of pay, the total anticipated injection rate will be about 1140 barrels per day.

Q At what pressure do you anticipate your injection rate will be calculated?

A It is my opinion that 650 pounds will be the maximum pressure that we can use for this operation.

MR. UTZ: Surface pressure?

A Surface pressure.

Q What is the average thickness of the pay in the pilot area?

A Forty-two feet.

Q What results do you anticipate from this pilot area?

A Based on the information available at this time, strictly from a volumetric calculation because of the lack of available data or history on flooding, this particular reservoir in this particular area we estimate that the maximum recoverable oil by water flooding this Queen sand to be 215 barrels per acre foot, and based on 42 feet of pay would be 9,000 barrels per acre for the area represented in the pilot flood.

Q What was that figure again?

A Nine thousand barrels per acre.

Q Do you have any estimate on the total recovery for the two inside locations?

A For a complete and efficient sweep of the enclosed areas, the two enclosed areas as shown on plat No. 1, the estimated recovery from those two producing wells is 361,000 barrels.

Q How does that compare with your estimates of your recovery on the primary operations?

A Our estimate of the increase as a direct result of water injection would be 283,600 barrels of primary.

Q Does that figure represent oil that would not be recovered if the pilot injection program were not instituted?

A That is correct. That is the amount of oil available on these calculations as a direct result of the water injection program.

Q As I understand it, you are proposing 20 acre spacing pattern in these five spot locations, for what reason have you done that?

A We have made some detailed calculations pertaining to optimum spacing for this particular reservoir, and the results of that study indicate 20 acre five spots to be the optimum spacing. In our opinion the maximum recovery can be obtained at the maximum economic feasibility.

Q What factors did you take into consideration in determining that spacing?

A In this type of analogy we used development costs, operating costs, the reserve estimates, and the anticipated life of such a project under various spacing patterns. A sufficient number of determinations were made over a wide spacing program from one to forty acres and by a number of computations in the plotting of curves, which is shown also as a part of this Exhibit No. 1 as Figure 6, the maximum net realization from such a

project could be obtained by developing the area on 20 acres.

Q Now, what life do you estimate for the pool under the water flood on the basis of 20 acre spacing?

A It is estimated at twelve to fourteen years.

Q Would that be different if the area were developed on 40 acre?

A Yes, the wider the spacing the longer life it would be probably up to twenty-five to thirty years on 40 acre units.

Q Would that affect the cash recovery from the pool?

A In my opinion it would. The useful life of equipment in a water flood, of course, is in our experience about fifteen years is considered maximum. After that period replacement costs could be extremely high, and often these costs can cause premature abandonment loss of reserves.

Q Would that result in loss of oil in the reservoir that would not be recovered?

A If in the operation of this project, because of corrosive waters that we expect to be using from this supply source and with subsequent replacement of equipment, it is very probable that potentially reserves could be lost.

Q Now, in the application, capacity allowables are requested for this project. Is there a need for capacity allowables in this area?

A ~~Well, I might say, of course, that one of the primary~~

reasons for requesting a pilot operation is to determine the accuracy of our predictions, also to determine the actual rate of water injection that we can obtain in this particular reservoir. As stated earlier we estimate about four and a half barrels per day per foor per sand capacity injection. Actually it will take a field test to determine whether this is a reasonable figure for injectivity, and in conjunction with that it is my opinion that capacity injection will be necessary to properly evaluate this flooding program. As a direct corollary to capacity injection, we would need capacity allowables in order to obtain maximum results from this operation.

Q What is your injection rate per foot? I believe you mentioned it earlier.

A Four and a half barrels per day per foot of pay at 650 pound surface pressure.

Q Your injection rate per acre foot of sand would be what?

A I don't have that figure in front of me, but I believe it would be .225 barrels per day per acre foot on 20 acre spacing.

Q In the event you are not granted capacity allowables, would it be economical to develop this area on 20 acre spacing?

A Well, of course that was taken into consideration in our analysis of the optimum spacing of this reservoir, and

capacity allowables certainly would enhance the economic feasibility. The closer the spacing, of course, the higher the development cost, the wider the spacing the higher the operating cost, so there has to be an economic balance arrived at based on cost for development and operating as well as the rate at which oil can be removed from the reservoir. Anything less than capacity allowables would certainly lessen the economic feasibility of this project. We do not know at this time, of course, the results definitely that we can expect by field operation.

Q In connection with the operation of the project area, are you willing to file with this Commission, and any other parties as the Commission may direct, reports on the progress of the pilot area?

A Yes, we would be very happy to do so.

Q The application also proposes an administrative procedure for conversion of wells from production to injection. Is there a need for that?

A Yes. There's a definite need for that, particularly if under this pilot operation the operator would proceed with the drilling of additional wells in the field, the possible future location for injection wells could be drilled and later converted to water injection upon expansion of the project.

Q There is also a proposal for administrative procedure for expansion of the project area. Is there any need for that?

A Yes, sir, as this is only a pilot operation and covers only a small portion of the Coyote Pool, there's a definite need for administrative procedure to expand this operation.

Q Would you be willing to file with this Commission the necessary reports to support an application for expansion of the area for the conversion of wells?

A Yes, sir.

Q Based on your examination of the area and the engineering work which you have done, in your opinion is this pilot project economically feasible?

A Based upon our investigation, it is economically feasible.

Q Is it in the interest of conservation and the prevention of waste?

A In my opinion it is.

Q In your opinion will it result in a greater ultimate recovery of oil from the area?

A If the results from the pilot flooding bear out our initial studies and investigations, it definitely will be.

Q Would that be oil which would not otherwise be recovered?

A Yes, sir.

Q Do you have any other comments?

A I believe not.

Q You have submitted to the Commission certain logs.

Do you have any comments to make on the logs which have been offered in evidence?

A Yes, these logs fairly represent the area.

Q Would you refer to them individually and by exhibit number for identification?

A The exhibit numbers on those logs, I don't have them in front of me. I would prefer to discuss them, all four logs as a group.

Q That is what I would like.

A The four logs on the presently completed four producing wells in the pilot area as Exhibits 2, 3, 4 and 5, on these logs we have shown the completion intervals for the five zones which we consider to be correlative in the reservoir. The pay zones and perforated intervals are shown on these logs in red. We have additional logs, I don't know --

Q From your examination of the logs and from your examination of the core data on the twelve wells which was available to you, in your opinion is this a uniform continuous reservoir?

A Yes. In the analysis of the cores and the study of the gamma ray and acoustic logs, the sand is correlatable from well to well and is fairly uniform from well to well.

Q What total volumes of water would you anticipate injecting in the pilot area, or did you cover that?

A I think we covered it. I don't mind repeating it.

We estimated 440 barrels per day into the six wells.

Q Were exhibits 1 through 5 prepared by you and under your supervision?

A They were.

MR. KELLAHIN: We would like to offer Exhibits 1 through 5.

(The documents heretofore marked Applicant's Exhibits Nos. 1 through 5 were offered in evidence by counsel for the Applicant.)

MR. UTZ: Without objection the Exhibits 1 through 5 will be accepted. I believe there were six exhibits.

Q Was Exhibit No. 6 prepared by you or under your direction and supervision?

A Of course Exhibit No. 6 is an electical survey of the well and was not --

Q Have you examined it, and in your opinion is it representative of the well?

A Yes, sir.

MR. KELLAHIN: We would like to offer Exhibit No. 6.

(The document heretofore marked Applicant's Exhibit No. 6 was offered in evidence by counsel for the Applicant.)

MR. UTZ: Without objection it will be accepted. Are there questions of the witness?

MR. RUSSELL: Mr. Porter, I have one. Mr. Utz.

CROSS EXAMINATION

BY MR. RUSSELL:

Q Mr. Russell, I believe you stated that the maximum spacing which you contemplate is 20 acre five spots, is that correct?

A That is considered to be optimum spacing, yes, sir.

Q You anticipate the expansion of this pilot program?

A Yes. I might qualify that by stating that it would be entirely dependent upon the results of the pilot flooding.

Q Do you have any opinion as to the area in which this water flood project may apply? How large an area?

A Well, the reservoir is not completely defined by the drilling to date. I would say that it would comprise at least 640 acres.

Q And that would be developed on the same spacing as the pilot as far as you know at this time?

A That is correct.

Q Have you arrived at any maximum daily figures for the production of water that may be required in your expanded program?

A The production of water --

Q Water.

A I don't quite understand you.

Q For injection purposes.

A The supply well water?

Q That is correct.

A Well, it's rather difficult to say what our total water requirements will be, but if our original calculations as to the injectivity capacity of this sand are correct, we will probably need as much as 4,000 barrels per day, or more, in the expanded flood.

Q Now, that would be on the basis of a 640 acre reservoir?

A Yes, I think, as I say, it is difficult to say how large this eventually will be. I can say that the average injection rate on an expanded flood we calculate at about 190 barrels per injection well. That would be multiplied by the future number of injection wells that we would have.

Q At the present time your study on this problem or project has been limited to the pilot program and a reservoir of approximately 640 acres?

A Yes.

Q For expanded purposes? A Yes.

Q Have you any information, or have you made any study as to the effect of withdrawal from the Glorietta formation in this area, upon the effect of the water in the Glorietta or San Andres to the west of you?

A No, sir, I have not.

MR. RUSSELL: I believe that's all.

MR. UTZ: Mr. Porter.

BY MR. PORTER:

Q Mr. Russell, do you make any prediction as to when you think you may have a response from the first injection?

A The response should be very soon after initial injection; because of the relatively small amount of fluid withdrawals to date, we should reach a hydraulic balance within a very short period of time. I would say in a matter of a few months.

Q Would that time be influenced by your spacing pattern, by your 20 or 40?

A Not appreciably.

Q I believe that you testified that the capacity allowables would be desirable here for the purposes of adequately utilizing this area by this pilot flood, or something to that effect?

A Yes, sir.

Q Do you think waste might occur if we didn't grant the capacity allowables?

A Well, I might answer it this way, if I may: That we have not made particular studies as to the desirability of slow flooding versus fast flooding, but in my opinion the injectivity capacity of this reservoir will be so low that it is possible that waste of oil could occur by decreasing our injectivities

below what the capacity injectivity of the same could be.

Q At this point your purpose, primary purpose, is for evaluating the project, that is your primary purpose in asking capacity allowables is for evaluating the project?

A That is correct.

Q I believe you testified, maybe I misunderstood it, but I believe you testified that more oil, in your opinion more oil would be recovered on a 20 acre pattern than a 40 acre, is that correct?

A Yes, sir. It is conceivable that more oil will be recovered on a 20 as opposed to a 40 acre.

Q Are you testifying just with reference to this particular pool or do you think that might apply to any pool?

A I'm testifying only to this particular pool.

MR. PORTER: Thank you.

MR. UTZ: Any other questions.

MR. RUSSELL: If the Commission please, I have a couple others.

MR. UTZ: All right.

BY MR. RUSSELL:

Q Now, your present water producing well has not been completed, is that correct?

A No, it is in the process of being completed at this time.

Q Do you know in the drilling of that well whether you encountered any water in the Aluvium?

A I am not acquainted with those facts, no, sir.

Q You do not know whether there is water in the Aluvium, the quality or the quantity of it?

A No, sir.

MR. UTZ: Any other questions?

MR. PAYNE: Yes, sir.

BY MR. PAYNE:

Q Is the proposed water supply well, does that have the capacity to produce all the water you need for the pilot?

A We do not know that at the present time. It will be necessary to recomplete the well which is in process at the present time and make production tests as to its capacity.

Q In your opinion does it cause waste to lessen the injection rate, once you have started injecting at a certain daily rate, to cut that figure down?

A I think it's possible in certain reservoirs.

Q So you think it's preferable to continue injecting at a constant rate?

A Yes, sir.

Q You feel you will have enough water for this purpose?

A If we don't get it from this particular well from the Glorietta, we must seek additional sources.

MR. PAYNE: Thank you.

BY MR. UTZ:

Q What is the status of the No. 3 well on the Levick State Lease?

A It is presently completed. I do not believe it has been potentialed as yet.

Q Is it capable of producing oil from the Queen?

A Yes, sir.

Q Then it is actually a part of this water flood project, is it not?

A It is a part of the project. However, it is outside of the area which we considered to be the immediate pilot area. Although it should respond or have some effect from the flood zone.

Q If it responds, is it part of the project?

A I think it is a part of the project which should be considered under the extension of the flooding at that time.

Q I believe you said these wells were all producing at the present time?

A They have been completed, I cannot testify as to whether they are all producing.

Q Well, can you tell me what they're capable of producing, or better yet, what they have produced for the month of June?

A No oil was run from those wells during the month of June to my knowledge.

Q Go ahead.

A I don't believe they have been potentialed during the month of June.

Q None of the five wells in question here have been potentialed?

A The five wells in question are the 1, 2, 3, 4 on the "C" Lease and the 1 and 2 on the Hanson "A" Lease.

Q Yes, sir.

A I cannot testify to that.

MR. KELLAHIN: I believe Mr. Williams will be able to give you some testimony on that.

MR. UTZ: All right.

Q Regarding your DeKalb Compton State water well, I understood you to say that there were water zones in the neighborhood of 2500 feet, is that correct?

A That is correct.

Q What is the area in the neighborhood of 750 to 900 feet that you have marked on this log?

A That is in the production section of the Queen, which we propose to water flood.

Q Is this water brackish, did I understand you to say?

A From the Glorietta?

Q Yes, sir.

A The indications that we have to date is that it is

brackish.

Q But you don't have an analysis?

A No, sir. The water has been too badly contaminated during the early testing period to obtain a chemical analysis of the water.

Q Mr. Russell, what is your definition of a pilot flood?

A Pilot flood is a project which is for the purpose of determining in the field the floodability characteristics of a reservoir.

Q How many injection wells would you have to have to accomplish that purpose?

A I think that a minimum of six wells which I have proposed for this project in order to obtain an adequate and sufficient cross section of injectivity and production capacities of the area are required in this particular case. The requirements of a pilot flood can vary from reservoir to reservoir, and I don't believe any definite statement as to the number of wells required for any or all pilot floods could be made.

Q You don't think four injection wells would pilot this area?

A Four injection wells would give us one complete five spot. It would not, in my opinion, give us adequate cross section on the same amount of information that the two opposing five spots would give us.

Q If this flood were not successful, then you would have drilled some unnecessary wells, would you not?

A Insofar as the injection wells are concerned?

Q Yes, sir, or producing wells.

A Yes, if the flood is unsuccessful, naturally the injection wells would be excess wells.

Q So the more wells you drill, the more economic waste would occur in that instance?

A But, I think that the drilling and completion and the use of the six injection wells in this particular case is pertinent to the analysis of expansion of the flood over the entire reservoir. With only four injection wells and one producing well completely enclosed, possibly could give us some misleading information which would lead to further economic waste if we did not have the six injection wells as proposed herein.

MR. UTZ: Does anyone have any questions of the witness? If not, the witness may be excused.

(Witness excused.)

MR. KELLAHIN: I would like to call as our next witness, Mr. Williamson.

N. R. WILLIAMSON

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A N. R. Williamson.

Q Are you engaged in business, Mr. Williamson?

A Yes.

Q What business are you engaged in?

A In the oil business.

Q With whom are you associated?

A Hanson, Waters and Williamson.

Q Is that a partnership?

A The Waters and Williamson is, Hanson is individual.

Q In regard to the application before the Commission, does that constitute a joint venture between Hanson, Waters and Williamson?

A Yes.

Q Who is in charge of the project?

A Waters and Williamson.

Q What position do you hold in connection with the project?

A I am a co-partner and operate the lease.

Q Are you familiar with the application before the Commission?

A Yes.

Q In regard to the plat which is shown attached to

Exhibit No. 1, there appears to be one lease in the immediate vicinity which is not held by the joint venture, being the M. G. Peters Lease.

A Yes.

Q Do you anticipate that would be affected by the project area?

A Well, not at this time.

Q In the event it is, what arrangements have you made with Mr. Peters in regard to that lease?

A I have discussed this matter with Mr. Peters and they said they would be glad to join us in this operation.

Q On the cross examination of Mr. Russell, some questions were asked as to the tests on the producing wells which have already been drilled. Would you discuss those wells and explain to the Examiner the present status of those wells?

A Well, the "C" No. 1 Well, it has been completed and potentialed, the "C" No. 2 is ready for potential at this time, and also the "C" -3 Well, the "C" 3 is the only one that is in this. The Hanson "A" 1 and "A" 2 has been completed and should be ready for potential within the next couple of days.

Q Would you be willing to supply any information obtained from those tests to the Commission?

A Well, we have recovered all the fract oil on the "C" 2 and "C" 3, the Hanson "A" No. 2 we lacked approximately 100

barrels of recovering the fract oil the last time I was on the lease, which was day before yesterday. We should have recovered all the fract oil on the Hanson "A" No. 2 at this time.

Q Do you know what any of the wells which have been potentialed showed?

A The "C" 1 potentialed I believe for 43 barrels after recovering fract oil, but has declined from that considerably.

Q Do you consider the well a submarginal well?

A Yes.

Q Mr. Williamson, in connection with our application it has been proposed that an administrative procedure be set up for conversion of wells and for expansion of the project area with capacity allowables. Have you any suggestion to make to the Commission in regard to the procedure to be followed?

A Well, nothing except that I think it would be a great deal expensive not to go through with that procedure.

Q Would you be willing to follow any procedure prescribed by the Commission as to filing reports with the Commission in connection with your application to any interested operator and to the office of the State Engineer?

A Yes.

Q At that time would you be willing to submit to the State Engineer's office and to this Commission estimates as to water to be used and source of water supply?

A Yes.

Q And in the event your application were not approved, would you be willing to present your evidence to the Commission?

A Yes.

MR. KELLAHIN: That's all the questions I have.

CROSS EXAMINATION

BY MR. UTZ:

Q How long will it be before you can supply the Commission the information regarding all five of these wells?

A Probably within, I would say, five days.

Q Will you do that as soon as it's available as to their initial potentials?

A Yes.

Q Do you intend to put these wells on the line and produce them as soon as they are completed?

A Yes.

Q I wonder if you would also supply the Commission with the producability of these wells, say after the first week or so of production?

A Yes.

Q Would you think that the water flood in this area immediately after drilling the initial well might be premature?

A Well, from the information that we have on the surrounding area, I wouldn't think so.

Q You mean as to the producability of the wells in the surrounding area?

A Yes, that's right.

MR. PAYNE: Are any of the surrounding wells top allowable wells, Mr. Williamson?

A No, definitely not.

MR. PAYNE: What do they make, average, about ten barrels?

A I would say they would average out just about ten barrels per day.

Q (By Mr. Utz) There actually has been no production on this lease up to the present time?

A That's right.

Q So you really don't know until you complete the wells what the potential is?

A That is true.

MR. UTZ: Any other questions of the witness?

BY MR. RUSSELL:

Q Would you furnish to the State Engineer any information you obtain as to presence or encountering of water in the Aluvium in these wells that you drill?

A Yes, I will.

Q Do you know, Mr. Williamson as to whether there is water in the Aluvium?

A Well, I think the only water that we have in that area is a shallow water which is in the Yates, and as far as I know there is no water in the San Andres. That is from the information that has been gathered off some cable tool holes in that particular area.

Q Do you know whether that is fresh water or brackish?

A Your Yates water is fresh water at approximately 120 to 60 feet.

Q Do you have sufficient information to determine whether there is a sufficient quantity of the water in the Yates formation which you could use for water flood purposes?

A Well, I would think that there are from the information that we have in there, we have a water well there, but I don't think that the water would be sufficient itself for a water flood purposes.

Q In quantity? A Well, yes.

Q Do you feel that it could be used perhaps in an expanded program in conjunction with the water you would be taking presently from the Glorietta?

A I don't think so.

MR. UTZ: Why not?

A Well, it's a fresh water and we are trying to stay with salt water all the way to flood this area with.

Q (By Mr. Russell) The question that I was referring to

was as to the quantity of water available there.

MR. KELLAHIN: Would you restate the question, please?

A I don't follow you there.

Q Do you have any information as to the quantity of water which is available in the Yates formation?

A No, not on a per barrel or per gallon basis. I know there is some water there, but I don't know how much.

Q You can't tell the Examiner at this time whether there would be a sufficient quantity available in the Yates formation to supply your water flood project?

A No, I couldn't.

Q In the drilling of future water supply wells, or your injection wells, would you be able to determine from them as to the quantity?

A I wouldn't think so, not the way we drilled those wells.

Q You don't run any tests in the Yates formation?

A No, that's right.

MR. RUSSELL: That's all.

BY MR. PAYNE:

Q You say you propose in the pilot and the expanded flood to use salt water if at all possible, is that right?

A Yes, sir.

MR. PAYNE: That's all.

BY MR. UTZ:

Q You have not yet developed this source of salt water, is that true?

A No, that's true. We do know it is salt water. They run a baler test, but it is insufficient to present at this time.

Q So actually you don't know just how much water you have got for this project, do you?

A That's right.

Q When do you intend to investigate the DeKalb Well?

A This next week we are putting a pump on it, this week.

Q Would you furnish the information as soon as it is available regarding your water supply and the availability of the water?

A Yes.

Q That is Glorietta water? A Glorietta water.

MR. UTZ: Any questions of the witness? If not, the witness may be excused.

(Witness excused.)

MR. KELLAHIN: That's all I have.

MR. UTZ: Any other statements to be made in this case? If there are none, the case will be taken under advisement. The hearing will recess until 1:15.

(Recess.)

STATE OF NEW MEXICO )
:
COUNTY OF BERNALILLO )

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 5th day of August, 1959.

Notary Public - Court Reporter

My Commission Expires:

June 19, 1963.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1228, heard by me on Aug. 5, 1959.

Examiner
New Mexico Oil Conservation Commission