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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
October 19, 1965

EXAMINER HEARING

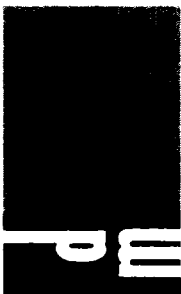
IN THE MATTER OF:

Application of Ann Burnett Windfohr,
George R. Brown, and Allied Chemical
Corporation for a waterflood project,
Eddy County, New Mexico. Applicants,
in the above-styled cause, seek authority
to institute a waterflood project in the
Grayburg Jackson Pool, Eddy County, New
Mexico, by the injection of water into
the Grayburg formation through three
wells in Section 25, Township 17 South,
Range 30 East.

Case No. 3322

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING



MR. NUTTER: Case 3322.

MR. DURRETT: Application of Ann Burnett Windfohr, George R. Brown, and Allied Chemical Corporation for a waterflood project, Eddy County, New Mexico.

MR. WATSON: The appearances for the Applicants are Mr. Rush Vann of the Windfohr Estate, from Fort Worth, Texas, although it's not intended that he testify; Mr. Ralph L. Gray, 302 Carper Building, Artesia, New Mexico, Engineer, who will testify for the Applicants on this project or application; and Fred A. Watson of Watson and Watson, Attorneys at Law, Carper Building, Artesia, New Mexico, is the attorney appearing for the Applicants. Mr. Gray will be the Applicants' witness.

(Witness sworn.)

(Whereupon, Applicants' Exhibits Nos. 1 through 4, both inclusive, marked for identification.)

RALPH L. GRAY

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

DIRECT EXAMINATION

BY MR. WATSON:

Q You are Mr. Ralph L. Gray of Artesia?

A Yes, sir.

MR. WATSON: Mr. Gray has testified before the Commission at a number of hearings. Are his qualifications

known and accepted by the Commission?

MR. NUTTER: Yes, sir, they are.

Q (By Mr. Watson) Mr. Gray, first, you have before you what's been marked as the Applicants' Exhibit No. 1. Would you state in some detail what that exhibit consists of?

A Exhibit 1 is a map of a portion of the Grayburg Jackson Pool. The map shows three wells on the Nash, Windfohr, Brown and Jackson "B" Lease in the North Half of Section 25, which the Applicant proposes to convert to water injection.

These wells are indicated on the map by the red circles. Also the map shows an undrilled location in the Southeast Quarter of the Southwest Quarter of Section 24.

Q These are all in Township 17 South, Range 30 East, N.M.P.M.?

A That's right. The Applicant also wishes to obtain authority to inject water into the undrilled location as shown on this map. The waterflood area which the Applicant proposes to flood is offsetting the Anadarko Production Company's unit. This was formerly known as the Ambassador Grayburg Waterflood Unit, and this unit offsets the Applicants' acreage to the west. The Ambassador Unit, as is shown on the map, has been waterflooding for, oh, roughly two and a half years.

Q This well, the undrilled location in Section 24, it is proposed to drill that?

A Yes. The Applicant anticipates that this will be drilled, although it's not definitely set up at this time.

Q Now if you would move to the Applicants' Exhibit No. 2, and describe the nature of that exhibit, please.

A Exhibit No. 2 lists the producing wells that will be converted to water injection, being Jackson "B" No. 6, No. 9, and No. 11 wells, and Exhibit 2 shows the exact location of these three producing wells. Also Exhibit 2 shows the exact location of the undrilled well in Section 24, which is anticipated to be used as an injection well at a later date.

Q And the Applicants' Exhibit No. 3 is an injection well diagram, is that correct?

A That's correct. Exhibit No. 3 is what we commonly refer to as a diagrammatic sketch of the proposed injection wells. This diagram shows the location of the casing strings that have been cemented.

Three columns are shown on this diagram. Each column shows the exact footage of the various items for Wells 6, 9, and 11. In each case, 8-5/8ths casing has been set and cemented into the top of the Rustler anhydrite section. The next string of casing is 7-inch, which is set in the Grayburg formation at approximately 3100 feet, and this string was cemented with 100 sacks of cement.

When the wells were originally completed, they were

completed in open hole, and the pay sand, which is the Premier sand of the Grayburg formation, was encountered at depths ranging from about 3200 to 3300 feet deep. The sketch shows a dotted liner, it's proposed to clean these wells out to total depth and 4-1/2 liners will then be cemented either on bottom or possibly at the top portion of the oil sand, and then these liners will be cemented back into the 7-inch casing. Then in finally completing these wells for injection, it's proposed to run a string of 2-3/8ths OD tubing which will be internally coated with plastic lining and then a packer will be installed on the bottom portion of the tubing and this will be set in the top portion of the liners.

Q Your zone to be flooded will be --

A The zone to be flooded will be the Grayburg Premier sand which will be near the bottom portion of these wells.

Q Now if you'll refer to Exhibit No. 4.

A Exhibit No. 4 is a table which shows the monthly oil production for each individual well from January, 1965, through July, 1965, and this also shows the cumulative oil production for each individual well as of August 1st, 1965. The primary purpose of this exhibit is to show that these wells are of the stripper type and that the reservoir has been essentially depleted, and so it's properly designated as a waterflood project.

Q Now as to your source of water, what source of water is proposed?

A An agreement has been made or is being made at this time with Anadarko Production Company whereby that company will furnish pressured water to the Applicants' Jackson "B" Lease, and this water will be used to flood this lease.

Q This will be simply a cooperative agreement where it is furnished at cost in order that you will go ahead with this flood offsetting the Anadarko operation at this time?

A That's correct.

Q What will be your volume of injection?

A It's anticipated that the average injection volume will be approximately 500 barrels per well per day.

Q Now returning for just a moment to Exhibit No. 1, is it proposed to, as time goes on and as the pattern permits or would seem to indicate, to expand this flood operation? The Applicants own other lands, do they not?

A Yes, sir. The Applicant owns the entire Section 24 of Township 17 South, Range 30 East, and as indicated on the map, they also own the Northeast Quarter of Section 23 and the North Half of the Southeast Quarter. Now both of these tracts directly offset the Anadarko Unit and we anticipate that sometime in the future the Anadarko flood will be expanded and that it may be desirable for the Applicant to meet

development by offsetting the unit in portions of these leases.

Q To whatever extent that it might be permitted by the rules and by the Commission, you would hope that this expansion could be accomplished by administrative order or administrative approval?

A Yes. We would like the Commission to provide in the order that this flood project could be expanded by administrative approval.

Q Also referring to your Exhibit 1, insofar as it indicates the three wells to be converted to injection wells and the proposed injection well to be drilled, does it show a normal five-spot pattern?

A That's correct. This is what we normally refer to as an 80-acre five-spot spacing pattern.

Q Does your pattern correspond with the development in the Anadarko unit?

A That's correct. It fits into the same pattern which they have established, and the proposals will provide for compensating offsets which will protect correlative rights along lease lines.

Q And it is an efficient pattern?

A Yes, sir.

Q And the Applicants are requesting that allowables be prorated in accordance with statewide Rule 701?

A That's correct.

MR. WATSON: The Applicants rest.

MR. NUTTER: Are there any questions of Mr. Gray?

MR. PORTER: I have one or two.

CROSS EXAMINATION

BY MR. PORTER:

Q Mr. Gray, about how old are these wells?

A The Jackson "B" wells on the Nash, Windfohr and Brown Lease were drilled in 1943, so they're about 23 years old.

Q Do you have knowledge of the response in the offsetting waterflood there? Are you familiar with the response there, Mr. Gray?

A Yes. We have followed the Ambassador flood and they have obtained response from the Premier sand which is considered satisfactory and we anticipate that we will be able to obtain the same type of response.

Q And that yours would perform about like theirs had?

A Yes.

Q Do you know about what they estimate would be the recovery in relation to primary recovery?

A No, sir.

Q One to one or --

A I really don't know what their thinking is on that. We haven't discussed that particular point.

Q And you haven't made any estimates on what you might expect to recover in relation to primary?

A From our experience in other floods which are maybe similar to this, we anticipate that they will get at least one times primary, and possibly somewhat higher.

MR. PORTER: That's all I have.

MR. WATSON: Mr. Examiner, I rested prematurely. I move the introduction of Applicants' Exhibits 1 through 4.

MR. NUTTER: Applicants' Exhibits 1 through 4 will be admitted in evidence.

(Whereupon, Applicants' Exhibits Nos. 1 through 4, both inclusive, were offered and admitted in evidence.)

BY MR. NUTTER:

Q Mr. Gray, this injection well diagram on Exhibit 3 is for the three wells that have already been completed. What kind of a casing and tubing and cementing program do you have in mind for the well which is going to be drilled?

A Well, we actually haven't set up any definite program on this yet. One reason is that we're not certain at this particular time whether such a well will be drilled by cable tools or whether it will be drilled by rotary, and the type of rig used would dictate to some extent the program that would be followed.

In any event, of course, the proposed program would

have to be approved by the proper regulatory bodies before the well could actually be drilled.

Q That casing and cementing program would normally be submitted to the United States Geological Survey for approval; this is a Federal lease?

A That's right.

Q Could you make provision for submitting your casing and cementing program to the Oil Conservation Commission and to the State Engineer's Office prior to sending it in to the United States Geological Survey, to see what you propose?

A Yes, we will be glad to furnish you with a program before the well is actually started.

Q We would appreciate that. Have your clients entered into a lease line agreement for waterflooding with the operators of the unit to the west?

A Yes. I understand that the agreement is currently being processed.

Q Is it their plan to put this Arnold No. 3 and the Stevens No. 5 which you have circled with a broken line on injection when you put your wells on injection?

A That's correct. Now the unit has renumbered their wells, so that actually the numbers as shown on this map have actually been changed.

Q But anyway, you know which wells I am talking about?

A Correct. We show these two wells on the map with a dotted circle which represents the proposed water injection pattern.

Q Those wells will go on injection at the same time your wells will?

A Approximately.

MR. PORTER: That's a continuation of your 80-acre five-spot pattern, isn't it?

A Yes, sir.

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

BY MR. DURRETT:

Q Mr. Gray, I am correct now that you seek some special administrative procedure for approval of additional wells?

A Yes, sir. We would like to be able to expand the program by administrative order.

Q You don't feel that the administrative procedure in 701 would be adequate for your needs?

A Yes, I think they would be adequate, yes, sir. In other words, it would be a matter of furnishing the offset operators with waivers and going through the routine waiting period in order to get approval.

Q But you don't want to be restricted to the situation where you have to receive a response or be offsetting a well

that has received a response?

A Well, not necessarily, because this would be dictated to some extent by the course of action that the Anadarko people take and the rate at which they expand their flood. Of course, it would be desirable to meet compensating offsets on the Nash, Windfohr and Brown Leases, so I think it would be up to the Applicant, at such time as he made an application for administrative order, it would be up to the Applicant to show really the reason for expanding the flood at that time.

Q What sort of guide lines would you recommend as far as the authority of the Secretary Director, who I would assume you would want to have this power? Do you suggest that if he determines that it would increase the efficiency of the flood --

A That would be the reason for making an application to expand the flood, yes, sir.

Q And that the Applicant would show the facts or reasons that he would feel it would increase the efficiency?

A Correct.

MR. DURRETT: Thank you.

MR. NUTTER: Are there any other questions?

MR. IRBY: Yes.

MR. NUTTER: Mr. Irby.

MR. IRBY: Frank Irby, State Engineer's Office.

BY MR. IRBY:

Q Mr. Gray, the exhibits that accompanied the application, on your Number 1 -- the well in Section 24 is to be the new well?

A Yes.

Q It's not shown, it's not indicated on your Exhibit 1, is that correct?

A This particular location I don't believe was included on our original map that accompanied the application. At that time it was anticipated that we would only ask for approval to inject into the three producing wells; but the map which we are showing as Exhibit 1 in this hearing shows the fourth location of this proposed well.

Q Are you asking for approval of it in this application?

A Yes, sir, we are asking for approval to inject water into that location at such time as it's drilled.

Q Not having had a set of the exhibits to be used at the hearing, I may ask you some unnecessary questions now. What are the wells in Section 22: 3, 6, and 7, circled and purple, what have they to do with this?

A These wells are water injection wells. They are present water injection wells within the Anadarko Grayburg Jackson Waterflood Unit.

Q Are they flooding the same formation that you propose to flood?

A Yes, sir.

Q In talking about your tubing, you stated that 2-3/8ths internally coated tubing and packer would be set. Did you say in the liner?

A Yes, sir. We expect to put a packer on the bottom of the tubing and it will actually be set in the top part of the liner that's installed.

Q Will the seal between the liner and the casing be tested?

A Yes. It will be tested to be sure that the packer is holding, yes, sir.

Q To what pressure will that be tested, Mr. Gray?

A Possibly 2,000 or 1500 pounds, in that range.

Q What's your injection pressure to be?

A Initially the wells will probably take water on a vacuum and then as the well bore is gradually filled up, we expect the pressure will gradually start climbing and possibly after two or three months we would expect the pressure to be somewhere around a thousand pounds. Then over a period of, oh, possibly a year or two, it may get up to fourteen or fifteen hundred pounds. That's approximately the pressures that have been encountered in the Ambassador Unit.

Q Well, shouldn't the seal that we just discussed be tested to a pressure in excess of your anticipated injection

pressure?

A We'd be happy to test it in excess if it's required.

Q May I have the results of this test?

A Yes, sir.

Q Now in discussing the source water, you said it was coming from Anadarko Production Company. This company is something new to me. Are they a water company?

A No, the Anadarko Production Company recently purchased the Ambassador Oil Company. I suspect that you are acquainted with the Ambassador because that was the name of the company that originally started the unit, and the Anadarko Production Company purchased the Ambassador so they're just merely taking over operation of this property. The water that is being used for flooding is actually purchased from the Double Eagle Water Company, a commercial water company.

MR. NUTTER: And then Anadarko is going to pressure it up. This is excess water that they have pressured up for their own flood and they are going to furnish you water for your wells?

A That's correct.

Q (By Mr. Irby) This is water from the Lea County Basin?

A Yes, sir.

Q Are you going to reinject the produced water?

A Well, actually that's beyond our control because the

agreement really is with the Anadarko Production Company to furnish us pressured water, and, of course, we don't know exactly what their program will be, say in the future. It's conceivable that sometime later in the life that they might want to utilize salt water, but if so, well, then we'll have to use whatever water they furnish into their line or provide our own source of water.

Q Well, do you have any agreement with Anadarko as to what will be done with the produced water?

A You mean on their leases?

Q No, on your lease.

A Our lease, no, sir, there's nothing in the agreement as to what will be done with the produced water on the Nash, Windfohr and Brown properties.

Q Then until such time as they decide they want this water and some agreement can be worked out, what disposition is going to be made of the produced water?

A Well, of course, at the present time there's practically no water being produced. Of course, as all floods usually react, we expect to produce water down the line, we don't know exactly what quantities or when we'll start producing it, but these are matters which we face as we have to, in other words. It's common practice to run this water into surface pits initially and then, as to whether the water is

actually utilized for other purposes, well, that depends on a lot of other factors which we're not able to establish right at this time.

MR. NUTTER: Let's put it this way, Mr. Gray. Now Anadarko or Ambassador has been operating this flood over here for two and a half years. Are they producing water yet?

A They are producing water from some of their wells.

MR. NUTTER: What are they doing with the water? Are they recycling it or disposing of it in pits?

A To my knowledge they are not recycling it. Actually I can't answer that definitely. I'm not real certain.

MR. NUTTER: I see. I notice in your application, Mr. Gray, you state that you had no logs and I am curious as to how you picked the contacts for the Rustler and the salt and the Grayburg and the oil sand shown in your exhibit on the typical well construction.

A Well, actually we do have sample logs on these wells. When we stated that we didn't have logs, we were referring to the electrical logs and gamma ray neutron type of logs. Before these wells are converted to injection, we do propose to run gamma ray neutron surveys along with calipers. Otherwise, the information that we have is from the geological logs which were run from sample cuttings at the time the wells were drilled. The formation tops were determined by the geologists

in this manner.

Q (By Mr. Irby) I believe you said that this liner might be set through the pay and perforated or it might be set at the top of the pay?

A Yes, we're not real certain at this time. We would like to see these logs and the caliper log before we actually make the final determination.

MR. IRBY: I believe that's all the questions I have. Thank you.

MR. NUTTER: Are there any other questions of the witness? If there are no further questions, the witness may be excused.

(Witness excused.)

MR. NUTTER: Mr. Watson, as a point of application here, this application was for three wells in Section 25, it was advertised that way. That will be the scope that we go into as far as authorization. However, you have requested administrative approval for additional wells, and this fourth well can be handled administratively later on.

MR. WATSON: All right.

MR. NUTTER: If there's nothing further in Case 3322 -- Mr. Durrett.

MR. DURRETT: I would like to state for the record that the Commission has received a telegram from Anadarko



supporting the Applicants.


MR. NUTTER: Thank you. If nothing further in Case 3322, we will take the case under advisement.

* * * *

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter - Notary Public, 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.

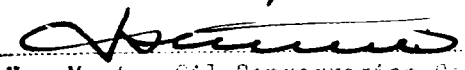
WITNESS my Hand and Seal this 9th day of November, 1965.


Court Reporter - Notary Public

My Commission Expires:

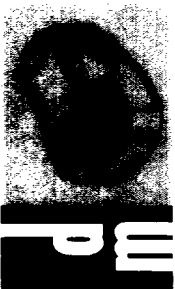
June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the hearing of Case No. **3322**, heard by me on **10/19**, 19**65**.


New Mexico Oil Conservation Commission

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NASH, WINDFOHR & BROWN

PROPOSED PROGRAM

Convert the following producing wells to water injection:

<u>WELL</u>	<u>LOCATION</u>
Jackson "B" #6	Unit D - Section 25-17S-30E
Jackson "B" #9	Unit F - Section 25-17S-30E
Jackson "B" #11	Unit B - Section 25-17S-30E

Authorize water injection into a well to be drilled
in Unit N, Section 24-17S-30E.

4/1/77

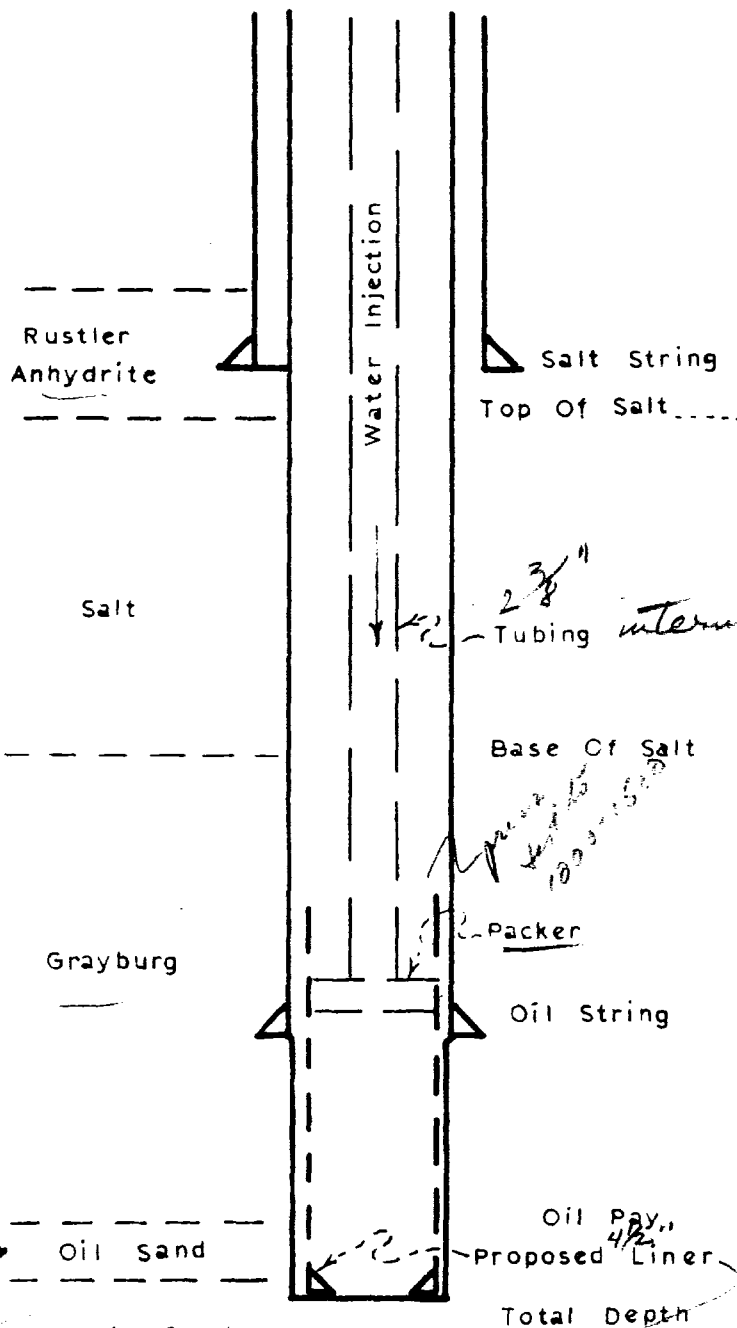
Exhibit 2

*Does not know
exact log
any. just guess*

INJECTION WELL DIAGRAM

INJECTION WELL No.

6 9 11



INJECTION WELL No. 6	INJECTION WELL No. 9	INJECTION WELL No. 11
8 5/8" at 580' - 50 sx N.A.	8 5/8" at 524' - 50 sx 585'	8 5/8" at 526' - 50 sx 535'
N.A.	1265	1265
7" at 3100' 100 sx	7" at 3095' 100 sx	7" at 3115' 100 sx
3205-55	3215-30	3265-3310
3260	3241	3355

Premier the sand is the Grayburg

could back into 70

*APP EX 3
Ca 3322*

Exhibit 3

OIL PRODUCTION

NASH, WINDFOHR & BROWN - JACKSON "B" - SEC. 25

	<u>WELL #6</u>	<u>#7</u>	<u>#8</u>	<u>#9</u>	<u>#10</u>	<u>#11</u>
<u>1965</u>						
Jan.	68	42	260	67	42	41
Feb.	61	37	235	61	38	38
Mar.	69	42	265	69	43	43
Apr.	67	41	259	67	42	42
May	66	41	255	66	41	40
June	64	39	246	64	40	40
July	63	39	244	63	39	40
Cumulative Oil Production	84,232	61,017	114,875	77,802	53,649	15,874

Present average daily oil production less than 3 BOPD.

*Source of water:
Quadrant (last 60 ft)
initial injection (500 to 1000 / day) in various
increments to about 14000 gpd
if pressure in 2000
at least 14000 gpd
in 1965*

Exhibit 4