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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
November 23, 1965

EXAMINER HEARING

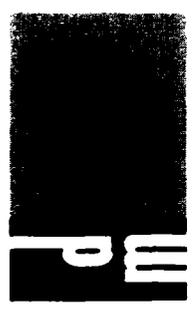
IN THE MATTER OF:)
 Application of Sunray DX Oil Company for a)
 waterflood project, Eddy County, New Mexico.)
 Applicant, in the above-styled cause, seeks)
 authority to institute a waterflood project)
 in the Grayburg-Jackson Pool, Eddy County,)
 New Mexico, by the injection of water into)
 the Keeley zone of the San Andres formation)
 through four weels in Sections 22 and 23,)
 Township 17 South, Range 29 East, and)
 Application of Sunray DX Oil Company for a)
 waterflood project, Eddy County, New Mexico)
 Applicant, in the above-styled cause, seeks)
 authority to institute a waterflood project)
 in the Grayburg-Jackson Pool, Eddy County,)
 New Mexico, by the injection of water into)
 the Metex zone in the Grayburg formation)
 through four injection wells in Sections)
 14 and 15, Township 17 South, Range 29 East.)

Case Nos. 3342
and 3343.

BEFORE:

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING



MR. DURRETT: Application of Sunray DX Oil Company for a waterflood project, Eddy County, New Mexico.

MR. WHITE: If the Examiner, please. Charles White of Santa Fe, New Mexico, appearing on behalf of the Applicant and we have one witness to be sworn at this time.

(Witness sworn.)

(Whereupon, Applicant's Exhibits 1 through 9 marked for identification.)

MR. WHITE: I would like to have them both consolidated if we may.

MR. NUTTER: We will call also Case 3343.

MR. DURRETT: Application of Sunray DX Oil Company for a waterflood project, Eddy County, New Mexico.

MR. NUTTER: Cases 3342 and 3343 will be consolidated for testimony.

MR. WHITE: May the record show the same appearance.

MR. NUTTER: It shall.

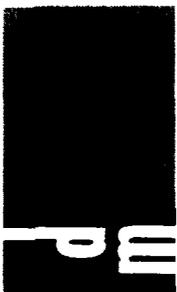
J O H N B. H A S T I N G S, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. WHITE:

Q Mr. Hastings, will you please state your name?

A John B. Hastings.



Q By whom are you employed and in what capacity?

A I'm employed by Sunray DX Oil Company as a production engineer in the Roswell District of it.

Q Are you familiar with Sunray's applications in Cases 3342 and 43?

A Yes, I am.

Q What does Sunray seek by these applications?

A Sunray DX Oil Company is seeking approval to initiate waterflood operations in Keeley and Metex zones under our Dodd "A" and Dodd "B" leases in Eddy County, New Mexico.

Q Would you refer to Exhibit 1 and explain your ownership plat, please? Now will you proceed please?

A Exhibit Number 1 is a lease plat showing the wells within a two-mile radius of our proposed project. It shows both ownership and producing intervals of each of the wells in the two leases.

Q Does it show the location of the project area?

A Yes, it does.

Q Does it show the location of the injection wells?

A Yes, both projects.

Q And does it show all wells within the two-mile limit?

A Yes, it does.

Q Is Exhibit Number 1 applicable to both cases: 3342 and 3343?

A Yes, sir, it is.

Q How about the ownership as to the Keeley project?

A Ownership is set out on a plat for both projects.

Q In your proposed waterflood in Case 3342 to the Keeley project, do you have any working agreement or coordination in your project with General American?

A Yes, sir. We are entering into a line well agreement with General American in which they will inject water into their Burch "C" Number 1 well.

Q Would you identify that on the exhibit, please?

A This is the easternmost injection well in the Keeley project.

Q Do you have a letter from them stating what they intend to do?

A Yes, sir, I do.

Q In substance, what is the gist of the letter?

A General American is agreeing to cooperate with us in our line well project in which they will furnish their own pressurized water to inject into this well.

Q And then you will coordinate your project with General American, is that correct?

A That is correct.

Q Will you refer to Exhibit 3 and 4 and identify the logs, please? Your log is Exhibit Number 3 in 3342?

A Yes. This is a reproduction of the gamma neutron logs for each of the proposed injection wells.

Q Have these logs previously been submitted to the Commission?

A Yes, they have.

Q Now, the logs will be Exhibit Number 4?

A Right.

Q In Case 3343?

A Right.

Q Now, will you refer to your Exhibit Number 4 pertaining to Case 3343 and will you explain that exhibit, please?

A Exhibit Number 4 is a diagrammatic sketch of the proposed injection well. On these sketches we have noted the surface casing, production casing, the amount of cement to cement these casing strings and cement tops. We have also note the producing intervals and the bridge plugs, the tubing depth and any proposed packers and these packer setting depths.

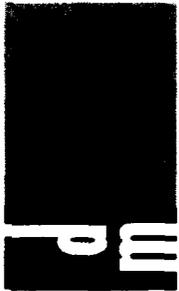
MR. NUTTER: What exhibit are you talking about, four?

MR. WHITE: Those are the logs for Case 3343.

MR. NUTTER: Is there supposed to be more than one sheet and have a log for each of them?

THE WITNESS: There's a log for each well.

MR. NUTTER: I believe that Case 3342 is the Keeley



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zone and Case 3343 is the Metex.

MR. WHITE: That's correct. The Keeley is the 3342.

MR. DURRETT: Dodd "A" Number 20, which case is that?

MR. WHITE: Dodd "A" Number 20 is the Metex zone.

MR. DURRETT: What is the Dodd "A" Number 19, which case?

MR. WHITE: Number 19 is also the Metex.

THE WITNESS: Should I read the numbers of the injection wells for the two projects?

MR. DURRETT: I think you should because I think we have some exhibits marked wrong.

MR. NUTTER: I don't believe that we have a full set of exhibits.

THE WITNESS: No, sir. I believe they just got separated going across the table.

MR. NUTTER: Now I have got, talking about the Keeley project, we have got well Number 9, 10, 11 and then the General American well, right?

THE WITNESS: That's correct. Here's another full set for the Keeley project.

MR. DURRETT: That's better. They're still put together.

MR. NUTTER: This is Case 3343?

MR. WHITE: This is Keeley in 3342 and this is also

complete set for the other project; that would be 3343, Exhibit Number 4.

Q (By Mr. White) Do you have any further comments as to Exhibits 3 and 4?

A No, sir. I believe the diagramatic sketches would be self-explanatory. They are all somewhat similar in nature.

Q Now, is there any correction to be made on the Dodd "A" Number 19?

A Yes, sir, there is.

MR. NUTTER: That is what exhibit, please?

MR. WHITE: The next one coming up.

A The diagramatic sketh erroneously shows that a Model "A" Baker packer will be set.

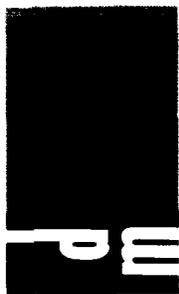
MR. NUTTER: I have one here that shows a bridge plug.

THE WITNESS: It should be a Baker Model "A" bridge plug.

MR. NUTTER: That would be Exhibit 5?

MR. WHITE: No, sir, that would be Exhibit 4. It should be a diagramatic sketch in Case 3342 and Exhibit 5 is your diagramatic sketch, number 3343 and the correction should be made in Case 3343, your Dodd "A" Number 19.

MR. NUTTER: In other words, this is not another additional exhibit. This is just a correction of the existing exhibit, is that right?



MR. WHITE: A correction to an existing exhibit, that's correct.

Q (By Mr. White) Will you explain your diagrammatic sketch in Exhibits 5 and 6?

A These sketches pertain to the proposed injection wells for the Keeley zone. The same information is noted on them as in the Metex: the casing strings, both surface and production strings, the amount of cement used to cement these strings, the tops of cement, perforated zones, tubing depths and the proposed packers, setting depths.

Q Is there any explanation needed in Exhibits 5 and 6?

A They should be self-explanatory.

Q And does this program include a contamination of the formation?

A We feel it will.

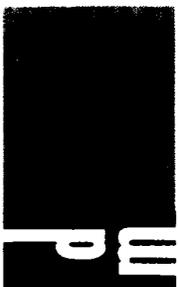
Q In your injection program do you intend to inject fresh water?

A Yes, sir, we do.

Q And what are your initial injection rates?

A We expect to obtain an injection rate of 500 barrels per day at 1250 psig in the Keeley zone and an injection rate of 1,000 barrels per day at approximately 1100 psig in the Metex zone.

Q What is your source of water supply?



A We will purchase this water from the Yucca Water Company of Lovington, New Mexico.

Q Have you submitted these applications to the State Engineer?

A Yes, sir, we have.

Q And do you have a letter from the State Engineer approving your proposal?

A Yes, sir, we have received such a letter.

Q With certain limitations or conditions?

A Yes, sir. I have a letter amending our original letter to Mr. Irby.

MR. WHITE: If the Commission, please. I believe the record should show that Mr. Irby addressed a letter to the Commission approving it. However, his letter was based Sunray's letter of October 28 and certain inquiries were made by Mr. Irby and since then we have sent him an additional letter which the Commission does not have a copy. I would like to identify this as Exhibit Number 7.

MR. DURRETT: Would you mark all those, Mr. White, because I don't think we have any of those letters.

MR. NUTTER: Is that the letter of November 3rd?

MR. WHITE: Yes, sir. I believe you have a copy of that.

THE WITNESS: This letter approving our application is

subsequent to this revision of our earlier letter.

Q (By Mr. White) And did Mr. Irby approve any project subsequent to your letter of November 3rd?

A That is correct.

MR. WHITE: I believe the Commission has on file Mr. Irby's letter of November 3rd wherein he refers to our letter of November 3rd which we just offered.

MR. DURRETT: I don't think we do.

MR. NUTTER: I think I have it on my desk. I know we got a letter. It's not in this file but I think it's on my desk.

MR. WHITE: This correspondence will complete the Examiner's record, right.

Q (By Mr. White) Are both reservoirs in a stage of depletion?

A Yes, sir, they are.

Q Will you refer and explain Exhibit 8, please?

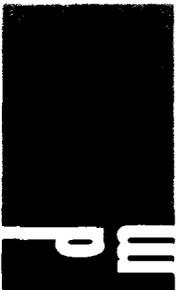
A Exhibit Number 8 --

Q Is this for the 42?

A No, I think this is for the Metex zone which is 43.

Q Now, Mr. Hastings will you please explain Exhibit 8?

A This is the decline curve of the Dodd "A" lease. This curve shows that the 19 producing wells on this lease are producing five barrels of oil per day.



Q Any further comments on Exhibit 8?

A Only that this lease is certainly in a stripper stage.

Q Now, will you refer to and explain Exhibit Number 9, please?

A Exhibit Number 9 is the decline curve of Dodd "B" lease. You will note that on the 13 producing wells on the Dodd "B" lease they are averaging 1.3 barrels of oil per day.

Q Will you now give the reservoir characteristics production data you might have?

A The Keeley zone is located and found at an average depth of approximately 3420 feet. It is composed of medium grade dolomite. We have an average effective pay thickness of approximately 12 feet and an average porosity of 8 per cent. The average horizontal permeability of 14 milidarcies and original connate water saturation of approximately 20 per cent. The gravity of the oil is 36.5 degrees API and has viscosity of about .6

MR. NUTTER: What was that depth again?

THE WITNESS: 3420.

Q (By Mr. White) In your opinion will both reservoirs lend themselves to waterflooding?

A Yes, we feel they would.

Q How many wells are making top allowable?

A None of the wells are making top allowable.

Q What is the best producing well?

A The best well is producing approximately 15 barrels of oil per day.

Q Do you have any estimates as to additional recoveries that you might obtain by reason of this project?

A Yes, sir. We are estimating that we would recover an additional 255,000 barrels due to waterflooding in the Keeley zone.

Q Are you requesting secondary recovery allowable pursuant to Rule 701?

A Yes, we are.

Q And would you like administrative approval to expand the area as presently provided?

A Yes, sir, we would.

Q Do you care to comment on your future plans?

A Let me ask: Aren't we a little bit ahead on something. We haven't given the characteristics of the Metex zone.

Q Go ahead with them.

A This Metex zone is found at approximately 2430 feet. It is a medium grain sandstone. We have an average effective pay thickness of approximately 14 feet and an average porosity of 21 per cent, an average horizontal permeability of 15 milidarcies, an original connate water saturation of 30 per cent. The oil is 34.5 degrees API gravity and has a viscosity

of approximately .774. We feel that we will be able to recovery an additional 450,000 barrels of oil due to waterflooding in the Metex zone.

Q What is your best producing well in this zone?

A Our best producing well in this zone is making approximately 11 barrels per day.

Q Now, I'll renew my question: Do you request secondary recovery allowable as to this one, too?

A Yes, sir, we certainly do.

Q You wish administrative approval to expand the area as presently provided by the Rules?

A Yes, sir.

Q In your opinion will each of these projects tend to conserve oil and prevent waste?

A Yes, sir.

Q Do you have any further testimony to offer?

A One other thing that we didn't expand on that you started: We would expect to have possibly eight additional injection wells at a later date in the Metex zone and probably five additional wells in the Keeley zone pending favorable results of these pilot projects.

Q Does that conclude your testimony?

A Yes, sir.

MR. WHITE: At this time we offer Exhibits 1 through

9.

MR. NUTTER: Sunray's Exhibits 1 through 9 in Cases 3342 and 3343 will be admitted in evidence.

(Whereupon, Applicant's Exhibits 1 through 9 were offered and admitted into evidence.)

MR. WHITE: That completes our presentation.

MR. NUTTER: Does anyone have any questions of the witness?

I didn't get your name, sir.

THE WITNESS: John Hastings.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Hastings, now in Exhibit Number 1, I realize that we have the Metex part of it in that north end of it and the Keeley pilot in the south end. Is there any Metex wells down in the south end here in the Keeley area?

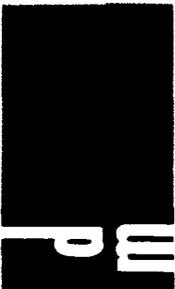
A There are Metex wells on the Dodd "A" lease which is generally down in the southern area but there are not Metex completions on the southern part of the Dodd "A" Lease.

Q Does "ME" signify a Metex completion?

A Yes, sir.

Q That Well Number 3 right there in the center of the Keeley pilot, for instance, it says "ME" along side that well?

A This is correct. This is also open in the Metex zone.



I also notice that there is a well just further south, also.

Q Now, do you have any Keeley wells in the north end there?

A I believe, for instance, Number 13 which is a Metex injector is open in the Keeley. Yes, this is correct but as you know on our diagramatic sketches we are separating or shall we say limiting our injection by the use of bridge plugs.

Q That's one you had a bridge plug set in to separate?

A Yes, sir.

Q So, in a given area you will only be flooding the zone that you are concerned with by the name of the project: The Keeley or the Metex?

A This is correct. We are limiting our injection to the Metex and to the Keeley in the two separate areas.

Q I see. Now, for the assignment of allowables I'll need to know exactly the ownership of these spaces. Now, down here in the Keeley pilot area, what is your Dodd "A" lease? Is it all of the east half of Section 22 with the exception of the that Leonard 40 and also the southeast of the southwest? Would that be the lease?

A That's correct and it also encompasses, I believe, with the exception of the northwest unit it also encompasses the northeast quarter section of Section 22.

Q That's what I mean. It's all of the east half except

the 140 plus the 140 down in the southeast of the southwest?

A Yes.

Q That's the Dodd "A" lease?

A Yes, sir, that is correct.

Q Now, General American has their Burch lease over there and they are going to have an injection well on that one?

A Their Burch "C" Number 1 will be converted to injection.

Q What is this other Burch lease that comprises the southwest of 23?

A This is their Burch General American Burch "B" lease.

Q Burch "B"?

A Yes.

Q The other one is Burch "C"?

A Right.

Q Now, up here in Section 14, is this Dodd "A" lease this "L" shaped 120, is that part of the other lease?

A Yes, sir, it is and I believe if you will note in Section 15, this also is encompassed in the Dodd "A" lease.

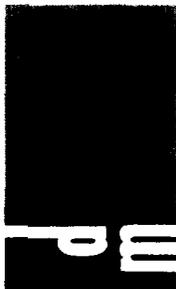
Q The southeast quarter?

A Right.

Q That's all Dodd "A" then?

A Yes, as well as this area in Section 14 which you just referred to.

Q And the northeast of 15 would be just about right



and the rest of 14. All that other in 14 is Dodd, "B"?

A Yes, sir.

MR. WHITE: Would it assist if we had them in color?

MR. NUTTER: No, I have them identified here.

Q (Mr. Nutter) Now Mr. Hastings, I really don't know how the allowable would be computed on a project like this where you are flooding two separate intervals at two projects but it's all in the same pool overall, isn't it?

A No, sir. Actually the Dodd "B" lease is in the Square Lake Pool while the Dodd "A" is in the Grayburg-Jackson although these encompass the same vertical limits here. The same zones are open in both projects.

Q Yes. This is probably going to present some problems in trying to compute the allowables. For instances, the well in the southwest southwest 14 is that 18, your Dodd "A" Number 18?

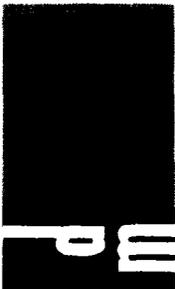
A Yes, sir.

Q Now, that is the northeast diagonal offset to your injection well number 10 in your Keeley pilot?

A Yes.

Q So, theoretically that would be eligible as northeast diagonal offset that would be eligible to be in the project area and share that allowable?

A Yes.



Q It's also a south offset to your number 20 in your Metex pilot?

A Yes, sir.

Q So theoretically it maybe eligible to receive an allowable for that project and to receive two allowables. You see what I'm running into?

A Yes, sir.

Q So I'm going to have to study this pretty carefully to just try to determine which zones these various wells are open in. Now, will any changes be made in the producing interval --

A No, sir.

Q -- on any of the producing wells?

A No.

Q Won't bridge any of the other zones off on them?

A Our present plans are not to do so.

Q You don't know off-hand where the limits of these two pools lies?

A No, sir. I certainly don't. I know that the Dodd "B" is in the Square Lake and the Dodd "A" are in the Grayburg-Jackson.

Q We will start to run a pool line through there and figure from there. Now, you mentioned that you were going to inject a total of or inject 1,000 barrels a day in the Metex

and 1250 into the Keeley. That's the sum of the injection in the four wells?

A In the Metex zone we will be injecting 1,000 barrels per injection well.

Q This is per well?

A That is correct. In the Keeley it is 1250 barrels per injection well.

Q You estimated 450,000 additional barrels in the Metex and 255,000, was it in the other one?

A 450,000 in the Metex and 255,000 in the Keeley. We arrived at this by somewhat conservative estimate of 75 per cent above our ultimate primary is what we are basing both of these on.

MR. NUTTER: Are there any other questions of Mr. Hastings? You may be excused.

Do you have anything further, Mr. White?

MR. WHITE: No, sir, that concludes our case.

MR. NUTTER: Does anyone else have anything they wish to offer in Case 3342 and Case 3343? We will take the cases under advisement and call Case 3344.

(Whereupon, Cases 3342 and 3343 were concluded.)

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