

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE 1740

TRANSCRIPT OF HEARING

AUGUST 19, 1959

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BEFORE THE
OIL CONSERVATION COMMISSION
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AUGUST 19, 1959

IN THE MATTER OF: :

CASE 1740 Application of Shell Oil Company for two salt :
water disposal wells. Applicant, in the :
above-styled cause, seeks an order authoriz- :
ing the disposal of produced salt water into :
the Queen Formation through its Allen Estate :
Well No. 3, located in the SE/4 SE/4 of Sec- :
tion 27 and through its Record Well No. 1, :
located in the NW/4 SW/4 of Section 26, both :
in Township 19 South, Range 35 East, Lea :
County, New Mexico. The proposed injection :
interval in said Allen Estate Well No. 3 is :
from 4900 feet to 4918 feet and the proposed :
injection interval in said Record Well No. 1 :
is from 4870 feet to 4884 feet. :

BEFORE:

Daniel S. Nutter, Examiner.

T R A N S C R I P T O F P R O C E E D I N G S

MR. NUTTER: We will take next Case 1740.

MR. PAYNE: Case 1740. Application of Shell Oil Com-
pany for two salt water disposal wells.

MR. SETH: Oliver Seth, appearing for Shell Oil Com-
pany. We have one witness.

(Witness sworn)

C. P. ST. LAURENT,

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

DIRECT EXAMINATION

BY MR. SETH:

Q Will you state your name and position with Shell Oil Company?

A Charles P. St. Laurent, Division Reservoir Engineer with Shell Oil Company, Roswell, New Mexico.

Q Will you give the Examiner a brief summary of your education and practical experience, please?

A I was graduated from the University of Pittsburg in 1949 with a Bachelor of Science degree in petroleum engineering, and was employed by Shell Oil Company as a petroleum engineer in 1959. For five years following this time, I was engaged in general petroleum engineering duties, including drilling, recompletions, completions and workover activities in the Gulf Coast area. During this time it was my responsibility to originate and design various aspects of the drilling and recompletions and workovers. I am a registered professional engineer in the State of Texas, and for the past two and a half years I have been actively engaged in various phases of reservoir engineering problems. I am currently assigned as Division Reservoir Engineer for Shell's Roswell, New Mexico division, a post I've held for one and a half years.

Q Are you generally familiar with the Pearl Queen --

A Yes, sir, I am.

Q -- field? Are you familiar with Shell's application in this case?

A Yes, sir.

MR. SETH: May he testify?

MR. NUTTER: Yes, sir. Proceed.

Q In connection with Shell's application in this case for salt water disposal wells, do you have a plat showing the proposed well locations?

A Yes, sir, a plat which we propose as Exhibit 1.

Q Would you describe to the Examiner, please, what this plat shows?

A Exhibit 1 is a plat showing the ownership and completed and drilling wells in the Pearl Queen Field, and identifying by the red circles the two wells proposed for disposal.

Q What does the cross-hatched area indicate?

A The cross-hatched area indicates Shell's ownership in the immediate vicinity of the disposal area; the four sections centering around the area we propose for disposal.

Q Now, referring to the Allen Estate No. 3 Well, which is one of the wells that you propose to use as an injection well, could you give us the location of this well first, please?

A Allen Estate Well No. 3 is located 660 feet from the South and East lines of Section 27, Township 19 South, Range 35 East.

Q Is this a Shell abandoned well?

A Yes, this is a well originally drilled to the Queen and abandoned.

Q Do you have a log on this well, Mr. St. Laurent?

A I believe I do, yes, sir.

Q Now, referring to this log which has been marked as Shell's Exhibit 2, would you describe, please, what this --

A Exhibit 2 is a later log run on Allen Estate 3 at the time the well was completed in May of 1959, and it indicates the Queen production formation, Pearl Queen Field, and indicates --

Q Where is this on Exhibit 2?

A The top of the Queen is at 4597 feet, and is so indicated on the log.

Q At what depth?

A 4597 feet. And shown on the log are the four stringers or zones of the Queen producing horizons in the Pearl Queen Field, and also indicated is zone 4, the proposed zone for disposal of salt water.

Q Where is zone 4 on Exhibit 2?

A The top of zone 4 is at 4900 feet.

Q You are referring now to the --

A State --

Q -- resistivity log in the center of Exhibit 2, is that right?

A Yes, sir, to the right hand side of Exhibit 2.

Q Is there anything further about this log that you would

like to mention?

A No, sir.

Q In connection with this proposal, has a diagram been prepared of the proposed completion of the Allen Estate Well No.3?

A Yes, sir, we have a diagram that was prepared showing the anticipated disposal of the Allen Estate Well No. 3.

Q This has been marked as Exhibit No. 2-A. Will you describe in some detail what Exhibit No. 2-A shows, please, Mr. St. Laurent?

A Yes, sir, this Exhibit indicates --

Q Excuse me. Would you describe, first, it might be a little clearer, the current completion situation on this well?

A Yes, sir. Allen Estate 3 is currently bottomed at 5,015 feet with 8 5/8 inch 32 pound H 40 surface casing cemented to surface at 96 feet. The well is plugged and abandoned at the present time. We propose --

Q It is an open hole?

A Except for the surface casing, yes, sir. We propose to clean the well out to the original total depth and to cement 5 1/2 inch 15 1/2 pound J-55 casing at 4900 feet with 200 sacks. We estimate the top of the cement will be at 3700 feet. We will then run 2 1/2 inch plastic coated tubing and set same at 4875 feet on a Baker Model A tension packer with 10,000 pound tension. The 2 1/2 inch tubing and 5 1/2 inch casing annulus will be filled with inhibited fresh water, and the annulus at the surface equipment with a

pressure gauge to permit observation on a daily basis. We will then dispose of produced salt water through the open hole interval below the packer 4900 to 5015 feet.

Q In your opinion, will this method of completion protect the fresh water beds, if there be any in this area and any horizons above your zone for the Queen from contamination by salt water?

A Yes, sir, I believe it will, and with the pressure gauge on the annulus we will be able at all times to observe and notice any leaks that might be occurring around the packer or through the tubing.

Q Now, referring to your Record State No. 1 Well, do you have a log on that, Mr. St. Laurent?

A Yes, sir.

Q Now, referring to this as Exhibit 3, would you describe, please, what this Exhibit shows?

A Exhibit 3 is a laterlog on Shell's Record 1, which well is located 1980 feet from the South line and 660 feet from the West line of Section 26, Township 19 South, Range 35 East. This log was run at the time of completion in April of 1958, and indicates the Queen formation, Pearl-Queen Field, which top of the formation is shown annotated on the log at 4576 feet. The proposed zone of disposal, zone 4 of the Queen sand, is shown as top at 4,869 feet.

Q Is there anything unusual about the formation in this locality?

A No, sir, nothing unusual.

Q This well was drilled approximately what date?

A The well was drilled in April of 1958 and found no production from the Queen sand, and consequently has been abandoned.

Q Now, have you prepared a diagram of the proposed completion of this well, --

A Yes, sir, for --

Q -- salt water disposal?

A We have, sir, shown as Exhibit 3-A.

Q Referring to this as Exhibit 3-A, now, would you describe, please, to the Examiner what Exhibit 3-A indicates?

A At the present time Record No. 1 is an abandoned well and is equipped with 8 5/8 inch 32 pound J-55 casing cemented to the surface and cemented at 324 feet. The well is further equipped with 5 1/2 inch 15 1/2 pound J-55 casing cemented at 4,918 feet with 700 sacks. We estimate --

Q Excuse me, go ahead.

A We estimate top of the cement at 2000 feet.

Q Now, was this a Shell well --

A Yes, sir.

Q -- drilled for Shell?

A Drilled for Shell, yes, sir.

Q And you are familiar with the condition of the well, the completion data of the well?

A Yes, sir. At the time of the original completion attempt, the 5 1/2 inch casing was perforated in the intervals 4,687 to 4,689 feet, 4,690 to 4,696 feet, 4,843 to 4,845 feet, 4,847 to 4,849 feet. We propose, should we acquire this well for salt water disposal, to squeeze cement these perforations and perforate zone 4 from 4,870 to 4,884 feet for disposal of salt water. The well will then be equipped with 2 1/2 inch plastic coated tubing set on a Baker Model "A" tension packer at 4,008 -- 4,850 feet with 10,000 pound tension. The annulus will be filled with inhibited fresh water, and the annulus at the surface will be equipped with a pressure gauge for observation.

Q In your opinion, will this method of completion protect fresh water beds as well as any producing sections of the Queen, oil producing sections of the Queen?

A Yes, sir, I believe it will.

Q Now, would you indicate to the Examiner, please, the amount of water that's involved for disposal?

A Approximately 250 barrels per day from Shell's production in the Pearl-Queen Field, which amounts to approximately 7600 barrels of water per month.

Q Is this all of Shell's water in the field?

A Yes, sir.

Q And how will it be gathered?

A The water at present is gathered at our automatic central facility in the Pearl-Queen Field, and it will be picked

up there and delivered through 2 1/2 inch cement lined steel tubing to the disposal well, where it will be injected into zone 4.

Q Is this well on the Commission's critical list for salt water disposal?

A No, sir, it is not on the Commission's list.

Q Will these facilities that you've described take care of Shell's salt water for the foreseeable future?

A Yes, sir, I believe these facilities will handle Shell's salt water production in the foreseeable future.

Q In your opinion, will the formations take this quantity of water at the indicated rate?

A Yes, sir, I believe that Allen Estate 3 will take this quantity of water.

Q And this will not endanger the fresh water zones or the oil producing zones?

A No, sir, I don't believe it will.

MR. SETH: That's all the direct questions. We would like to ask that our Exhibits 1 through 3-A be admitted.

MR. NUTTER: No objection. Shell's Exhibits in this case will be entered.

Any questions of this witness?

MR. PAYNE: Yes, sir.

MR. NUTTER: Mr. Payne.

CROSS EXAMINATION

BY MR. PAYNE:

Q Are both of these wells located within the confines of the Lea County underground water basin?

A Yes, sir.

Q Now, you feel that the fresh water will be adequately protected inasmuch as you are going to inject the salt water through tubing and that you are going to have the casing filled with fresh water, is that right?

A Yes, sir, inhibited fresh water and equipped with the pressure gauge to let us know if there is any by-passing of the packer or leakage in the tube.

Q What purpose does this plastic coated tubing have?

A It's used, sir, to prevent rust or corrosion from forming.

Q How does the Baker Model "A" tension packer set work?

A It is set in tension. The slips are in effect reversed and set when you pull up on the packer, and the base, or packer element, is below, and the only contact the packer will have with the injected water will be solid metal base at the bottom and none of the workable parts will be in contact with the disposed water.

Q Where is the nearest producing well producing from the formation into which you intend to inject?

A The nearest oil production in zone 4 -- if you will refer to Exhibit 1, our plat there -- is approximately on, it's slightly in excess of a mile north and slightly west of the Allen Estate 3. It will be --

MR. SETH: Will you identify it, please?

A Yes, sir, I will. I would say the southern and central portion of Section 22 will be the nearest production that might be obtained from zone 4.

Q That is producing from the Queen Formation?

A Yes, sir.

Q Is the Pearl-Queen Field, is it a water drive pool?

A No, sir, it is a depletion type reservoir with no water drive.

Q You feel that the Queen Formation will be adequately protected and that you won't endanger the oil and gas producing strata by injecting through this well, is that right?

A I do, yes, sir.

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

QUESTIONS BY MR. NUTTER:

Q Now, you didn't mean that the nearest well that is producing from the Queen was a mile away, --

A No, sir.

Q -- but only producing from this one particular sand that we are talking about?

A Yes, sir, from zone 4. We have Queen production on the Allen Estate lease from other zones.

Q For instance, your well No. 2?

A Allen Estate 2, yes, sir.

Q They are north of the injection Well No. 3 and west of

that Well No. 1?

A Yes, sir.

Q What is that lease, Nora Scott?

A No, sir, the lease is the Allen Estate. The wells are Allen Estate 1, 2 and 3.

Q What formation is that producing from?

A From the Queen, sir.

Q What interval in the Queen, do you know?

A No, sir. Just a moment. I haven't the record available here, sir, but I would estimate the production is from zones 1 and 3 in the Queen.

Q What do you call zones 1 and 3 on the logs of these wells that you have here?

A Referring to the log of Allen Estate 3, the top of zone 1 is at approximately 4,712 feet. The top of zone 3 is approximately at 4,863 feet.

Q Where is zone No. 2, please?

A Zone 2 would be 4,818 feet.

Q And zone 4 in that well is 4,900?

A 4,900, yes, sir.

Q Do you think there is any communication between these zones, for instance, zone 3 and zone 4?

A You mean across the field, sir, or --

Q Well, I mean from your disposal well to the nearest producing well that is producing in zone 3?

A No, sir, I don't believe there will be. The zones here overlies one another with a fairly regular interval across the field, and we haven't noticed any interchange or communication between the zones.

Q Structurally, are your disposal wells No. 1 and 3 higher or lower than the other wells in the pool that are producing?

A Well, I would say that the proposed disposal wells are structurally lower than the majority of the other wells in the field. There are some on the extreme west flank not producing from zone 4.

Q Is the top of the Queen -- what, is your contour there based on the top of the Queen or one of the zones?

A Top of zone 4.

Q On zone 4?

A Yes, sir.

Q Is zone 4 on your contour map there in Wells No. 1 and 3, the injection wells, lower than in Record No. 1 and Allen Estate No. 2?

A Record 1 and Allen Estate 3 are the disposal wells, Allen Estate --

Q I meant this H. S. Record No. 1, in the SW of the SE of 27?

A Oh, I see. Yes.

Q Are these disposal wells higher or lower than those

two wells, being the --

A Allen Estate 3 is structurally lower than Allen Estate 1 or 2, and is approximately the same structural position as H. S. Record 1.

Q And how about --

A And Record 1 is approximately the same structural position as Allen Estate 2 and is structurally higher in zone 4 than H. S. Record 1.

MR. NUTTER: Any further questions?

Q (By Mr. Nutter) Neither one of these wells produced oil in commercial quantities?

A No, sir, each of the zones were water bearing in both of the wells. I mean all of the zones were water bearing in both of the zones.

MR. IRBY: Mr. Examiner, I would like to know the injection into the Allen Estate No. 3. He gave it on the other one, but I don't think he did on that.

A Sir, our total daily injection will be 250 barrels per day which we will dispose of in Allen Estate 3, and we don't intend to use Record 1 unless it becomes necessary at some future date due to plugging off of the No. 4, but the Allen Estate will handle the full daily requirement.

MR. NUTTER: Any further questions? The witness may be excused.

(Witness excused)

MR. SETH: That's all we have in this case.

MR. NUTTER: Does anyone have anything further to offer in Case 1740? Take the case under advisement and take a ten-minute recess.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, J. A. Trujillo, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in Stenotype and reduced to typewritten transcript by me, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this, the 4th day of September
1959, in the City of Albuquerque, County of Bernalillo, State of
New Mexico.

Joseph G. Luyck
NOTARY PUBLIC

My Commission Expires:

October 5, 1960

I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case No. 1740
heard by me on 8-19, 1957

....., Examiner
New Mexico Oil Conservation Commission