BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 1576
Order No. R-1321

APPLICATION OF SINCLAIR OIL & GAS
COMPANY FOR AN ORDER AUTHORIZING
A SALT WATER DISPOSAL WELL IN SECTION
22, TOWNSHIP 18 SOUTH, RANGE 35 EAST,
NMPM, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on January 7, 1959, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 14th day of January, 1959, the Commission, a quorum being present, having considered the application, the evidence adduced and the recommendations of the Examiner, Elvis A. Utz, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Sinclair Oil & Gas Company, is the owner and operator of the abandoned No. 2 State Lea 403 Well, located 660 feet from the South line and 660 feet from the West line of Section 22, Township 18 South, Range 35 East, NMPM, Lea County, New Mexico.

(3) That the applicant proposes to inject salt water through tubing in the said No. 2 State Lea 403 Well into the Devonian formation below the water-oil contact with the proposed injection zone from 11,938 to 11,978 feet.

(4) That a packer should be set above the injection interval.

(5) That the annulus should be filled with sweet oil as an additional precaution against corrosion and against contamination of the fresh water or oil producing horizons.

(6) That the applicant's proposed salt water injection program will not jeopardize the production of oil, gas, or fresh water in the area and is consonant with sound conservation practices.

IT IS THEREFORE ORDERED:

(1) That the applicant, Sinclair Oil & Gas Company, be and the same is hereby authorized to utilize its No. 2 State Lea 403 Well, located 660 feet from the South line and 660 feet from the West line of Section 22, Township 18 South, Range 35 East, NMPM, Lea County, New Mexico, for the purpose of disposing of produced salt water into the Devonian formation below the water-oil contact in the interval between 11,938 feet and 11,978 feet.

PROVIDED HOWEVER, That the salt water shall be injected through tubing and provided further that a packer shall be set above the injection interval.

PROVIDED FURTHER, That the annulus shall be filledwith sweet oil.

(2) That the applicant shall submit monthly reports of its disposal operations in accordance with Rules 704 and 1119 of the Commission's Rules and Regulations.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

JOHN BURROUGHS, Chairman

MURRAY E. MORGAN, Member

A. L. PORTER, Jr., Member & Secretary

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BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

Case No. 1576

TRANSCRIPT OF HEARING

January 7, 1959

DEARNLEY - MEIER & ASSOCIATES
GENERAL LAW REPORTERS
ALBUQUERQUE, NEW MEXICO
Phone CHapel 3-6691

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

Case 1576

Application of Sinclair Oil & Gas Company for a salt water disposal well. Applicant, in the above-styled cause, seeks an order authorizing it to convert its dry and abandoned No. 2 State Lea 403 Well to a salt water disposal well in the Devonian formation, South Vacuum-Devonian Pool; said well is located 660 feet from the South and West lines of Section 22, Township 18 South, Range 35 East, Lea County, New Mexico.

Mabry Hall
Santa Fe, New Mexico
January 7, 1959

BEFORE:

Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: The next case is 1576.

MR. PAYNE: Case 1576, "Application of Sinclair Oil & Gas Company for a salt water disposal well."

MR. UTZ: You may proceed, Mr. White.

MR. WHITE: Charles Gilbert of Gilbert, White and Gilbert, Santa Fe, New Mexico, appearing on behalf of the applicant. We have one witness, Mr. Andy Anderson, to be sworn.

(Witness sworn in).

(Whereupon, the documents were marked for identification

as Applicant's Exhibits One through Five).

RICHARD M. ANDERSON

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

DIRECT EXAMINATION

BY MR. WHITE:

Q Mr. Anderson, state your full name, please?

A Richard M. Anderson.

Q By whom are you employed and in what capacity?

A Sinclair Oil and Gas Company as a senior engineer in the Midland Division, Midland, Texas.

Q Mr. Anderson, are you familiar with Sinclair's program to inject salt water into the Devonian formation, South Vacuum Devonian Pool?

A I am.

Q Have you previously testified before the Commission?

A I have.

MR. WHITE: Are the witness' qualifications acceptable?

MR. UTZ: He has previously qualified, yes sir.

Q (By Mr. White) Mr. Anderson, will you refer to what has been marked as Exhibit Number One and state what it is and explain it, please?

A Exhibit Number One is an ownership map showing the ownership and the location of all of the wells in the South Vacuum Devonian field area. The subject well in this application is

Sinclair's H403 Well Number 2, which was a dry hole located in the southwest corner 660 feet out of the southwest corner of Section 22, Township 18 South, Range 35 East.

Q Does that also show the location of all of the wells within the area and the names of adjoining lessees and offset operators?

A Yes sir, it does, and it also shows a line of cross section identified "AA" prime, which is Exhibit Three, will be our Exhibit Three.

Q The red lines will be tied in with Exhibit Three?

A Yes, sir.

Q What are the names of the formations from which the wells in this field are producing?

A I have shown that information on Exhibit Two.

Q That would be your structural map?

A Yes, sir.

Q Will you refer to that, please?

A Exhibit Two is a structure map on top of the Devonian formation in this area, and I have colored the Devonian wells blue, the Pennsylvania producers yellow, the Bone Spring producers green and the McKee producer violet and have identified that color code in the bottom of the exhibit in the legend. I have one discrepancy to mention on this map and that is the Gackle Hammond Well Number 1 which is located in the southwest quarter of Section 27. It is colored green, which indicates a Bone Spring producer,

and it is carried on the Commission's proration schedule in the Reeves-Pennsylvanian field and should possibly have been colored yellow. I have reason to believe that well may have been re-completed and plugged back to Bone Spring; however, I am not sure of the status of that particular well at this time.

Q Continue and further explain the exhibit, please.

A I have indicated on this exhibit with a dashed red line the oil-water contact in the Devonian formation and in the northern structure I have indicated that water table will occur at minue 7825. This is the present water table as determined by drill stem tests and current present producing characteristics. For the south structure of the area, I have shown the oil-water contact to vary from minus 7880 in the northern end to minus 7856 in the southern end of the south structure. I have shown by a large green circle Sinclair's State 403 Well Number 2, which is the subject well of this application, the well we propose to dispose of our salt water into, and I have shown a line of Section "AA" prime, in green on this map, which is our Exhibit Three.

Q Now, will you refer to Exhibit Three, please, and explain that cross section of the map?

A Exhibit Three is a north-south cross section "AA" prime as identified on Exhibits One and Two and consists, starting at the north, of Sinclair State 401 Number 2, which is a Devonian producer. The second well from the left is Sinclair State 403 Well Number 2, which is a Devonian dry hole and the well we propose to

inject water into; Sinclair State 405 Number 1, which is a Devonian producer, and Magnolia South Vacuum, Magnolia State 27 Number 1, which is a Devonian producer. Now, on this cross section, I have drawn in the top of the Devonian formation using intermediate points as taken off of the structure map, which is Exhibit Two.

Q Does it also show the oil-water contact?

A Yes, and I have also put on the oil-water contacts and have identified them as such for both the northern structure, which is on the left of this exhibit, and the southern structure, which is on the right of this exhibit, and we see the saddle or valley between the two structures that were shown on Exhibit Two clearly defined on Exhibit Three and we see that our well, our proposed injection well, is located just about at the lowest point of that saddle.

Q Now, will you refer to what has been marked as Exhibit Four and explain that diagramatic sketch, please?

A Exhibit Four is a diagramatic sketch of the proposed salt water disposal well. On the left of this sketch, I have drawn a diagramatic sketch showing the present status of this dry and plugged Devonian well and we see there that we have surface pipe of 13 7/8 set at 332 feet and that the cement was circulated to the surface. This exhibit also reflects that 9 5/8 inch casing was set at 4,000 feet and that the top of the cement was determined to be 460 feet from the surface. This exhibit also indicates that the 9 5/8 inch casing was cut at 440 feet during the plugging

operations. We see three cement plugs and the exact location of those plugs is indicated on this exhibit, and the hole between the plugs is full of heavy mud.

Q That is indicated by the diagram on the left hand side?

A Yes sir, the diagram on the right hand side shows the well after our proposed conversion. The same surface pipe will be there cemented to the surface, 13 3/8 seal at 303 feet, same intermediate pipe. We will merely mud up--drill out the cement plugs that you see on the left hand diagram and clean out the hole to TD and we propose to run 5 1/2 inch casing and propose to set it at or near the--at the top of the Devonian formation and we propose to cement it with enough cement to fill the annular space behind the 5 1/2 to approximately five or six hundred feet.

I might mention at this time that I discussed this for the first time with Mr. Irby this morning and showed him our proposed installation and Mr. Irby expressed some concern over the 108 feet of open hole that exists from the base of the surface pipe to the top of the intermediate string.

Q That's what distance?

A That's from 332 feet to 440 feet. However, he advised me that his department would have no objection to our proposed installation provided we used tubing and injected the salt water through the tubing as shown on this sketch and have a packer set somewhere near the bottom of the 5 1/2 inch casing around at 11,900 feet and also if we made periodic pressure tests of the

tubing casing annulus to determine whether or not there was any leak in the 5 1/2 inch casing which might result in the disposed salt water getting into the formation opposite that open hole interval, 108 feet of open hole interval.

Although we were asking that we be given the option here today of either injecting down the casing, down the annulus of the casing, without using tubing or using tubing, whichever seemed feasible when we--as we put the installation in as we found what was necessary, we were asking for the option to inject without the tubing, we would be agreeable, in view of Mr. Irby's objection, to using either two-inch, as I have shown on this sketch, or two and a half inch tubing. We feel we should have that leeway so we would not have to come back here at a later date in the event that water production volumes became large enough that we would have to have larger tubing.

Q Mr. Anderson, in your opinion, is this proposed casing program adequate to protect any fresh water zones, and especially in view of the use of injecting salt water through the tubing?

A Yes sir, I believe that this is adequate to protect all fresh water sands.

Q What number of barrels of salt water per day do you intend to inject?

A We are currently producing about 840 barrels of Devonian salt water per day from two Sinclair wells and about 60 barrels of salt water a day from our Sinclair-Bone Spring completion

for a total of 900 barrels of salt water a day.

Q Is this water corrosive?

A The Devonian water is not, we have run a coupon test on it. The Bone Spring water was corrosive to some extent and we are treating that well by injection an inhibitor into the annulus and the water that is being produced at present is not corrosive.

Q Would there be any possibility for this salt water to be injected into other zones?

A No, sir.

Q Is the formation which you intend to inject this water into of sufficient porosity and permeability to accept this volume of water, in your opinion?

A Yes sir, it is.

Q And what is that opinion based upon?

A Drill stem tests and core analysis of the Devonian in the subject well.

MR. WHITE: If the Commission please, we filed a full-scale log with the application, and if the Commission desires, we will have it introduced in evidence as well.

MR. UTZ: It might be well to do so.

Q (By Mr. White) Mr. Anderson, have these exhibits that we have referred to been prepared either by you or under your direction or supervision?

A They have.

MR. WHITE: At this time, we move for the admission of the

exhibits.

MR. UTZ: Without objection, Exhibits One through Five will be accepted.

Q (By Mr. White) Mr. Anderson, would you give a very brief history of the development of the pool?

A Yes, the pool was discovered by the drilling of Union Oil of California's South Vacuum Unit Well Number 1, which was completed January 26, 1958 for an initial potential of 1733 barrels of oil per day. At that time, the well was taken over by the Pure Oil Company, who is another member of the South Vacuum unit, and since that time, there have been four additional Devonian wells completed, three Devonian tests which resulted in completions in other zones and two Devonian tests that were unsuccessful in all zones. At present, there is one Devonian test drilling in the area.

Q In your opinion, will this proposed salt water program be in the interests of conservation?

A Yes.

Q And do you know if the Devonian formation will be damaged in any way with the injection of this salt water?

A No, sir.

MR. WHITE: That's all the questions we have.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Anderson, the subsea datum top of the proposed

injection interval, would that be 8,047?

A Yes, sir.

Q That is well below your lowest oil-water contact as shown on Exhibit Two, is it not?

A Yes sir, it's 223 feet below the oil-water contact in the north structure and it's a hundred and sixty-nine feet below the oil-water contact in the south structure.

Q Yes. I believe you stated that the water that you were going to inject is not corrosive. Was part of it corrosive?

A The Bone Spring water is corrosive; however, we are successfully treating the water and it is not corrosive when it comes out of the well with our routine treatment.

Q In other words, the water, the Bone Spring water will be treated?

A Yes sir, it's treated in the well before it is produced, in the Bone Spring well before it is produced.

MR. WHITE: In other words, all the water that is to be injected will be non-corrosive?

A Yes, sir.

Q (By Mr. Utz) Had you considered filling the 5 1/2 by 2 3/8 annulus with sweet oil?

A No sir, I hadn't--we hadn't planned on that; however, we would be agreeable to doing that.

Q Do you not think that that would be a very goodway to be sure that no salt water was leaking into the zone other than

your preferred injection zone?

A Yes, sir.

Q Now, about how many wells will this injection well serve?

A Initially, it will serve Sinclair's two Devonian producers and Sinclair's one Bone Spring producer, which are not all the producers that Sinclair has in the area. However, Magnolia and Pure each have producing wells, as well as Jake Hammond, and several in the Reeves-Pennsylvanian area and we would, of course, be agreeable to disposing of their water if so requested.

Q It was your statement, was it not, that in order to avoid the 128-foot open hole question, that you would be willing to inject through the 2 3/8 inch?

A I believe it's 108 feet. Yes sir, in order to satisfy Mr. Irby's objection, we would be willing to inject through tubing.

Q A hundred and eight feet, correct. 440 feet is the top of the casing--cement, rather, and the casing was actually 440 feet and the bottom of the surface is 332, is that right?

A Yes, sir.

Q I believe you mentioned before you would like the leeway to inject through either 2-inch or 2 1/2-inch?

A We don't want to come back if we want to run larger tubing in there at a later date. Initially, we will run 2-inch.

MR. UTZ: Are there other questions of the witness?

MR. FISCHER: I have one.

MR. UTZ: Mr. Fischer?

CROSS EXAMINATION

BY MR. FISCHER:

Q Do you know the nature of the formation between your bottom of your surface string, 13 3/8 at 332 and the 9 5/8 at 440?

A I called--Mr. Irby mentioned it this morning. I was caught flat-footed and I called our district geologist in Roswell, Mr. Harold Merrill, and asked him to run a gammaray neutron test and see whether there was any porosity indicated in that area and he said there was none. He said there was some porosity indicated in the 332-foot interval protected by the surface pipe and he said that there was porosity indicated from 930 feet to 120 feet, which Mr. Irby said is probably the Santa Rosa.

Q Well, will your mud behind the 5 1/2 come up inside that 13 3/8?

A Yes, sir.

Q Well, what I was getting at is, do you suppose there's a possibility of that open hole formation in that open hole to cave in?

A You mean during the running of the cleaning up and the running of the 5 1/2-inch pipe?

Q Yes.

A I don't think so for this reason: We had that formation open from 332 feet to 4,000 feet when we set our intermediate string and apparently there was no cave-in or any difficulties

encountered during that time.

Q One other thing. Did you say that that water would go in under gravity?

A I believe it will.

Q You have roughly 6,000 pounds down at the bottom. It seems like it should.

A Yes, sir.

MR. FISCHER: Thank you, that's all.

MR. UTZ: Are there other questions of the witness?

If there are no other questions, the witness may be excused.

(Witness excused).

MR. UTZ: Are there other statements to be made in this case?

If there are not, the case will be taken under advisement.

We will take about a fifteen-minute recess.

(Short recess).

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

I, JERRY MARTINEZ, NotaryPublic in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing was reported by me in Stenotype and that the same was reduced to typewritten transcript by me and contains a true and correct record of said hearing, to the best of my knowledge, skill and ability.

DATED this 9th day of January, 1959, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Jerry Martinez
Notary Public

My Commission Expires:
January 24, 1962

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1576, heard by me on 1-7, 1959.

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