STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

31 July 1985

EXAMINER HEARING

IN THE MATTER OF:

Application of Santa Fe Energy Company for salt water disposal, Lea County, New Mexico. CASE 8654

BEFORE: Gilbert P. Quintana, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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MR. QUINTANA: Call next Case 8659.

MR. TAYLOR: Application of Santa Fe Energy Company for salt water disposal, Lea County, New Mexico.

MR. BRUCE: Mr. Examiner, my name is Jim Bruce from the Hinkle Law Firm in Santa Fe, and I have two witnesses to be sworn.

MR. QUINTANA: Are there further appearances in Case 8659?

If not, would you have your witnesses please stand and be sworn in at this time?

(Witnesses sworn.)

MR. QUINTANA: You may proceed.

PATRICK TOWER,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. BRUCE:

Q Would you please state your name, ad-

dress, occupation, and employer?

A My name is Patrick Tower. I'm a Senior Landman with Santa Fe Energy Company in Midland, Texas.

Q Have you previously testified before the OCD as a landman and had your credentials accepted as a matter of record?

A Yes, I have.

Q Are you familiar with Case 8659 and the land matters involved in this case?

A Yes, I am.

MR. BRUCE: Mr. Examiner, is the witness considered qualified?

MR. QUINTANA: Yes, he is. You may proceed.

Q Mr. Tower, would you briefly state what

Santa Fe Energy Company seeks by this application?

A Santa Fe Energy Company seeks authority to convert its Santa Fe Pacific Railroad No. 15 Well to a salt water disposal well and to use the well to dispose of produced salt water into the San Andres formation at approximate depth of 5000 feet.

The Santa Fe Pacific Railroad Well No. 15 is located in Unit B of Section 34, Township 9 South, Range 37 East, in Lea County, New Mexico.

This well is currently an uneconomical producer being pumped less than one day per month.

The Santa Fe Pacific Railroad No. 15 Well will replace the Santa Fe Pacific Railroad No. 6 Well, which was a salt water disposal well used by Santa Fe and which was plugged and abandoned March 13th, 1985, due to casing and tubing problems.

The Well No. 6 was located in Unit D of Section 33, Township 9 South, Range 37 East, which is approximately 1-1/2 miles to the west of the Well No. 15.

Well No. 6 was approved as a disposal well by OCD Order No. R-5073.

Q Thank you. Would you please refer to Exhibit Number One and briefly describe it?

A Exhibit Number One is a land plat of the subject area showing the proposed disposal well and also

showing a 1/2 mile radius around the well. Both the producing and nonproducing wells are shown in the area.

There is production within one mile of the Santa Fe Pacific Railroad No. 15 Well, primarily to the northwest and southwest.

Santa Fe Energy Company owns and operates all wells within the area of review. The only offset lease owner within a half mile, besides Santa Fe Energy Company, is ARCO.

Q Are there any other salt water disposal wells near Well No. 15?

A Yes, there are. There's two; one being the Cox USN No. 2 Well in Unit H of Section 27 of the same township and range, and the Coastal Oil and Gas Santa Fe No. 2 Well in Unit F of Section 33, also same township and range.

Q Have ARCO and the surface owner been notified of this application and in that respect I refer you to Exhibits Two, Three, and Four.

A Yes, they have. Exhibit Two is a letter to Michael Harton, who is the surface owner, and Exhibit Three is a letter to ARCO Oil and Gas Company, who is the offset lease owner, and both of these, with these exhibits are attached the certified return receipts evidencing their notice.

Exhibit Four consists of copies of the notice published in the Hobbs Daily News.

Q In your opinion will the granting of this application be in the interest of conservation, the prevention of waste, and the protection of correlative rights?

A Yes, it will.

Q And were Exhibits One through Four prepared or compiled by you from records kept by the District Office of Santa Fe Energy Company?

A Yes, they were.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits One through Four.

MR. QUINTANA: Exhibits One through Four will be entered as evidence.

MR. BRUCE: I have no further questions of this wtiness.

CROSS EXAMINATION

BY MR. QUINTANA:

Q Correct me if I'm wrong, Mr. Tower, but the reason this case is here before us today is because there's production within a 2-mile radius of the injection well?

A Yes, sir.

Q And you stated that wells within a mile -- within a half mile and a mile of this proposed disposal well are producers of Santa Fe Energy?

A Let me see.

Q Let me clarify that for you. Those two circles there, which is a 1/2-mile circle, the inner circle?

A The outer circle.

Q The outer circle is a 1/2-mile circle on Exhibit One?

A Yes, sir.

Q What's the inner circle?

MR. GAUME: My name is Pat Gaume. I'll be testifying in a minute.

MR. QUINTANA: Okay.

MR. GAUME: That map was prepared by me. The inner circle simply highlights Well No. 15.

MR. QUINTANA: Okay.

MR. GAUME: The outer circle --

MR. QUINTANA: Is the 1/2-mile --

MR. GAUME: -- is the 1/2-mile radius.

MR. QUINTANA: Okay, fine. Thank you, that clarifies it.

You may be excused.

PATRICK J. GAUME,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. BRUCE:

Q Would you please state your name, address, occupation, and employer?

A My name is Patrick J. Gaume. My address is 2509 Cimarron, Midland, Texas. My occupation is Senior production Engineer, Santa Fe Energy Company.

Q And have you previously testified before the New Mexico OCD?

A No.

Q Would you please give a summary of your educational and work background?

A I grew up in Las Cruces; graduated from New Mexico State University with a BS in civil engineering from New Mexico State University in 1976.

I am a certified EIT in Texas.

Since 1976 I've been employed in the oil and gas industry by Hughes Tool Company, Gulf Oil Corporation and Santa Fe Energy Company, primarily as a production

engineer, all in West Texas and New Mexico.

I'm a Registered Professional Engineer in Texas.

Q Are you familiar with Case 8659 and the engineering matters involved in this case?

A Yes, I am.

Q And do your duties at Santa Fe Energy Company encompass responsibility for salt water disposal wells?

A Yes.

MR. BRUCE: Mr. Examiner, is the witness considered qualified?

MR. QUINTANA: How many direct -- approximately how many direct years of petroleum engineering experience do you have, actual petroleum engineering experience?

A Eight and a half of the nine years.

MR. QUINTANA: He is considered an expert petroleum engineer.

You may proceed.

Q Would you please refer to Exhibits Five and Six, describe them, and detail the history, current status, and proposed completion of Well No. 15 and the reasons you seek this application?

A May I stand? Exhibit Number Five is the

well data sheet, legal sized sheet that you see before you, and Exhibit Six is a structure map which we have on the wall.

Particularly I'd like to direct your attention on the well data sheet to the lefthand side the fluid level shot and pumped in tests that were run on 3-9 of '85 and 3-20 of '85, toward the bottom of the information there.

This structure map is a structure map of the top of the San Andres B zone of the West Sawyer Field. it encompasses four leases that we operate.

The first is the SFPRR lease in Sections 27, 28, 33, and 34. It originally has 23 wells of which No. 6 is now plugged and abandoned.

The Rich Unit is a single well lease in unit -- what is that -- well, anyway, the south -- southwest quarter of Section 34.

Then we also have a two-well lease in Federal 27; two-well lease Federal 22, in Sections 27 and 22, respectively.

Our lease holdings are marked in yellow.

Our application is made for economic reasons. When we were -- when we -- it was to our economic advantage to operate a disposal well, the SFPRR No. 6, as compared with trucking costs, and because of our increased

plugging -- water disposal cost, we've had to cut production on the Rich Unit No. 1 to just a couple -- to about four days a month, and it's been to our economic disadvantage and we've had to cut the production on the SFPR No. 15 to about one day a month, or less, because under a water hauling situation they are both uneconomic to produce.

Also on all of our wells our operating expenses are up and because of that our wells reach economic limit sooner and as wells get P&Aed at economic limit, our ultimate reserves on each well are reduced and our ultimate recovery would therefore be reduced without a replacement salt water disposal well.

Therefore our field, we feel that our field oil reserves will be conservatively produced as a result of this salt water disposal well.

This structure map does show the top of our San Andres B Zone, which we describe as a marker to simply show the top of our productive interval.

And we have observed a trend here. We show and believe that we have generally a permeability pinchout up dip to the northwest. We have a fairly well defined oil/water contact to the southeast.

The SFPR No. 6 was high to the northwest in the area of pinchout and required about 1800 to 2000 pounds pressure to dispose of water over its entire life.

Of course this is a 5000 (not understood.)

The SFPR No. 15 is low to the southeast and the oil/water contact and has a high apparent permeability.

The SFPR No. 15 was selected as a replacement salt water disposal well for eight reasons.

The first reason, it has the highest total fluid production of all of our SFPR wells.

Second reason, its oil cut over its entire life has been five to ten percent, meaning its water cut has been 90 to 95 percent.

As our shot (not understood) indicates we have a low bottom hole pressure. I calculated it to be about 790 pounds and when we ran our pump-in test, we found that that test indicates that the well could take fluid on low pump-in pressure, especially as compared to the SFPR No. 6.

Fifth reason, all the wells within a half mile are Santa Fe Energy operated. The results of the pump-in --

Sixth reason, the results of the pump-in test indicates an expensive workover to either deepen the well to other porous intervals or have to perforate additional could be avoided due to its high ability to accept fluid or produce fluid in existing perforations.

Second to the last point, if the field was ever converted to waterflood, it does fit into some possible patterns.

Finally, by converting this well to salt water disposal, the salt water disposal system is relieved of its heaviest water producer. Where the SFPRR No. 6 had to handle an average of about 440 barrels of water a day, this well would have 440 minus 170, or about 270 barrels of water a day to handle, at least in the near term.

MR. QUINTANA: I'd like to make a brief statement, Mr. -- is it Gaume?

A Yes.

MR. QUINTANA: The basic things that I'm concerned with in permitting a salt water disposal well through the State of New Mexico is -- in this case is to determine that you will not adversely affect production offsetting the well, even though it's your own production, and two is to make sure -- to insure that you -- the mechanical integrity and the operating practices of the injection well do not affect fresh water sources. And those are my two basic concerns, so if you would address those, I would appreciate it.

A I will, yes, sir.

MR. QUINTANA: You may proceed.

Q Mr. Gaume, what will the injection pres-

sure and the anticipated injection volume be?

A About 1000 pounds and 270 to 300 barrels a day.

Q And you seek authority for the maximum of 1000 pounds, although you do not know if that will be necessary at this time, is that correct?

A Yes. At the present time I'm asking for 1000 pounds. Our pump-in tests indicate that that's all that will be required.

Q What is the source of the fluids to be disposed of?

A It's local San Andres water and will be disposed back into the San Andres formation.

Q Therefore you anticipate no compatibility problems.

A None.

Q Will you please briefly describe the current status of other wells in the area of review and in connection with that will you look at, and describe, Exhibit Seven-A through Seven-F?

A Seven-A through Seven-F are well sketches of -- of several wells either within the half mile radius or very near to the half mile radius of the SFPRR No. 15. They are all owned and operated by Santa Fe Energy Company and in a general statement, this whole field was drilled 1972-73

with identical casing, casing plans, programs, et cetera, and all these wells are about twelve to thirteen years old and of high integrity right now.

Q Is there any fresh water formation in this area?

A Yes. And you'll notice all of this casing -- all of these wells have 8-5/8ths inch casing past 400 feet with cement to surface.

Q Are there any fresh water wells within a mile of the proposed salt water disposal well?

A Yes. There's a well in Unit C of Section 34. We just located this well. We find that it's a windmill about 150 feet away from our ODC-1 in the Rich Unit.

Q Are there any geological faults connecting the fresh water formation with the disposal zone?

A No, none that we're aware of.

Q In your opinion will the granting of this application be in the interest of conservation, the prevention of waste, and the protection of correlative rights?

A Yes.

Q And were Exhibits Five through Seven prepared or compiled by you or under your direction?

A Yes.

MR. BRUCE: Mr. Examiner, I

move the admission of Exhibits Five through Seven.

MR. QUINTANA: Exhibits Five through Seven will be admitted in evidence.

MR. BRUCE: I have no further questions of this witness.

MR. QUINTANA: Mr. Gaume, I have several questions for you.

A Yes, sir.

CROSS EXAMINATION

BY MR. QUINTANA:

Q Let me start out with the fresh water well that you just pointed out to me.

Do you have a sample of that --

A I was --

Q Do you have a water analysis of that water well?

A No, sir, I'll be happy to submit one to you as soon as possible.

Q I would appreciate if you would do that, and to explain the reason for that, it serves two purposes. One is if there is pollution in that fresh water source at this time we know it's not you, it's already there.

Two, if it happens later then we know it's most likely coming from, possibly from you.

It's a base sample for us to use for your protection.

The second question I had is could you explain to me in detail the mechanical details of the proposed completion of the salt water disposal well?

A What we would be doing is we would be utilizing our existing casing, existing perforations. We would go in with -- with an injection packer and set it -- if I can find my notes there -- we would set it some distance above the perforations, probably on the order of about 60 feet, and we would inject through plastic-coated tubing.

Q What type of packer do you plan to use?

A Just an oil field standard; probably use a Baker or a Guiberson injection packer.

Q 2-3/8ths inch tubing?

A Yes.

Q Do you feel that the well has been adequately cemented around the casing to protect --

A Yes, I do.

Q All the fresh water zones have been covered?

A Yes, I do.

Q Any offsetting injection zones that -- you're injecting into any offsetting zones and those are covered, which I don't think you are.

A No, sir, we are not, but -- but we have every reason to believe high integrity of this well and the offsetting wells.

Q The injection disposal zone would be 4960 to 4990, is that correct?

A No, the injection zone would be -- well, yes, when you -- when you take the 15 foot -- well, we have a Kelly bushing of only 11 feet. I show my perforations at 4985 to 5020.

Q And that's what you would like to have approved as the official disposal zone?

A That's -- yes, sir, perhaps the entire interval or, you know, zone of the San Andres B Zone, if that's -- but that would be fine. That 35 foot interval is what we would inject into, yes, sir.

Q There are no P&A wells within a half mile radius.

A No, sir.

Q Other than the well --

A Well, that -- event he SFPRR No. 6 is a mile and a half away.

Q Okay.

A If you'll look up toward the northeast you'll see that there was one that is outside the half mile radius.

Q Is it your professional opinion that you will not adversely affect production offsetting this disposal well?

A That is my professional opinion.

Q Do you happen also to have a sample of the San Andres water?

A Yes, I do. Would you like me to submit it?

Q Yes, I would.

A The sample is from our SFPRR No. 4. It was run in July of 1984. This was run by Halliburton.

Q And that sample would be indicative of both the disposal zone and water that you produce, which is the same?

A Yes, sir, it would.

MR. BRUCE: Mr. Examiner, if I may say one thing. The fresh water well is in Unit L, not Unit C, of Section 34.

MR. QUINTANA: Exhibit Eight will be admitted as evidence at this time.

I have no further questions of the witness.

Are there further questions of the witness from anybody else?

MR. TAYLOR: Mr. Gaume, is it

your professional opinion that your procedures here would protect fresh water resources?

A Yes.

MR. TAYLOR: Okay, that's all I have.

MR. QUINTANA: I have one final statement to make to you, Mr. Gaume.

You requested 1000 pounds pressure, surface injection pressure. It's the OCD's policy to grant .2 psi per foot. In the event that you would request a higher pressure we would require you to run a step rate test and we'll examine the step rate test and determine the injection pressure from that.

A That's -- that's correct.

MR. QUINTANA: All right. If there are no further questions of the witness, he may be excused, and Case 8659 will be taken under advisement.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 8659 heard by me on July 31, 1985.

Gilbert P. Quintana, Examiner
Oil Conservation Division