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

27 February 1985

EXAMINER HEARING

IN THE MATTER OF:

Application of J. M. Huber Corporation for salt water disposal, Lea County, New Mexico.	CASE 8493

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division:	Jeff Taylor Attorney at Law Legal Counsel to the Division State Land Office Bldg. Santa Fe, New Mexico 87501
For the Applicant:	James T. Jennings Attorney at Law JENNINGS & CHRISTY P. O. Box 1180 Roswell, New Mexico 88201

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MR. STOGNER: We will now call Case Number 8493.

MR. TAYLOR: Application of J. M. Huber Corporation for salt water disposal, Lea County, New Mexico.

MR. JENNINGS: Mr. Examiner, I'm James T. Jennings, Jennings and Christy, appearing on behalf of the applicant, and we will have one witness, Mr. Nutter.

MR. STOGNER: Are there any other appearances in this matter?

(Witness sworn.)

MR. JENNINGS: May I proceed, Mr. Examiner?

MR. STOGNER: If you please, Mr. Jennings.

DANIEL S. NUTTER,

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

DIRECT EXAMINATION

BY MR. JENNINGS:

Q Would you state your name, occupation,

please, sir?

A My name is Dan Nutter. I'm a consulting petroleum engineer.

Q Mr. Nutter, have you had occasion to appear before the Division in the past on many occasions?

A Yes, sir, I have.

MR. JENNINGS: Are the witness' qualifications as a petroleum engineer acceptable -- expert petroleum engineer accepted, Mr. Examiner?

MR. STOGNER: Undisputably.

Q Mr. Nutter, would you refer to what has been marked as Applicant's Exhibit Number One and identify it and explain it, please?

A Applicant's Exhibit Number One is a plat of the area of the Morton Wolfcamp Pool.

The red dot in the northwest quarter of the southwest quarter of Section 7, Township 15 South, Range 35 East, is the subject well, which is requested to be approved as a salt water disposal well.

There are two concentric circles drawn around that red well, the first being the half mile radius and the second being the two mile radius.

There are also three triangles colored in red, which we will discuss later.

Q Will you just locate the well, please, Mr. Nutter?

A Yes, sir. The well is in the northwest

quarter of the southwest quarter of Section 7, Township 18 South -- 15 South, Range 35 East, Lea County, New Mexico.

Q Is that in the Morton Field?

A That is in the Morton Wolfcamp Pool.

Q Mr. Nutter, would you please refer to what has been marked as Exhibit Two and identify and explain it for us.

A Yes, sir. The Cabot "Q" State Well No. 1, which is the subject well, is a well that belongs to Huber Corporation. It is presently a Wolfcamp producing well but it has been depleted and it's proposed that it be plugged back and converted to a salt water disposal well.

Exhibit Number Two shows the program that would be used in plugging the well back from its present perforations from 9920 to 10,120 in the Wolfcamp. There would be numerous cement plugs spotted up and down the casing of the well and there is a cement liner, you'll note. There is a 5-1/2 inch liner. This doesn't have a long -- a full string of long production pipe. Instead it has a liner which is set inside the 8-5/8ths inch intermediate casing. That liner at the present time is not squeezed; however, it would be squeezed prior to conversion of the well to the salt water disposal well.

So we have shown cement at the intersection of the 8-5/8ths inch intermediate pipe and the 5-1/2 inch liner.

Q Would you now refer to what has been

marked as Exhibit Three and identify it and explain it, please?

A You'll recall that Exhibit One had the one-half mile circle drawn on it. This is the area of interest as prescribed by the Commission rules in which the casing and cementing programs for all wells be reported to the Commission in an application for salt water disposal.

This is, Exhibit Three is a list of all of the wells that are located within that half mile circle of the proposed disposal well.

You'll note that most of the wells are producing. They're producing from the Wolfcamp formation. Two of them are plugged and abandoned. One is a salt water disposal well and one well is shut-in. That's the subject well that's the object of our case today.

Q Now would you again refer to what has been marked as Exhibit Four, which is a packet, and explain it, identify it and explain the packet and the documents therein?

A Exhibit Four, as you stated, is a packet. It contains the well data on the twelve wells that are listed on Exhibit Three. It also contains a schematic diagram of each of the subject wells.

Now, the proposed -- I won't go through the casing and cementing programs for all of these wells; however, if you will turn to the fourth sheet in this packet, this is the proposed disposal well. We will go through

the casing and cementing program on this well.

Q That is identified as J. M. Huber Corporation Cabot "Q" State Well.

A That is correct.

Q Okay.

A That is the proposed salt water disposal well.

This well has 13-2/8ths inch casing set at 363 feet. It was cemented with 350 sacks of cement and the cement circulated to the surface. The hole size was 17-1/2 inch.

After surface pipe was set a 12-1/4 inch hole was drilled and 9-5/8ths inch intermediate casing was set at 4630 and cemented with 2300 sacks.

The top of the cement on that string of casing is 100 feet below the surface.

The long string is a 5-1/2 inch liner, the top of which is at 4057 feet and the bottom of which is at 12,160 feet. This string of casing was cemented with 1590 sacks. The top of the cement, determined by cement bond log, is at 5620 feet. This casing was run in a 7-7/8ths inch hole.

The proposed disposal would be into an overall interval of 4630 feet to 6050 feet, which would be from the casing shoe on the intermediate down to the bottom of a very porous section in the San Andres formation; however, initially we do not propose to perforate that entire

interval.

Our initial perforations will be in this lower section of the San Andres from 5839 feet to 6050 feet. Later on, as the formation fills with water, we would want to have authority to perforate additional zones above that porous interval in the San Andres, at which time the perforations would go as high as 4630 feet.

As seen on Exhibit Two, which was the proposed plugging procedure to bring the well back to 6200 feet, it would be perforated, or plugged back to 6200 feet.

The perforations from 5839 feet to 6050 feet, that's our initial perforations we're proposing immediately, would be acidized with 6000 gallons of 15 percent hydrochloric acid.

We would then complete the well by installing 2-7/8ths inch tubing, which would be plastic-coated on the inside, set in a Backer LokSet packer at 5800 feet.

We would load the annulus with an inert fluid and install a pressure gauge on the annulus.

Also, I would like to mention the sixth sheet in this packet, which is the J. M. Huber Corporation Superior State Well No. 1, and you will note that the top of the cement on the long string is at 5960 feet and the intermediate casing is set at 4576 feet. This leaves the interval from 4576 to 5960 without casing opposite the pipe.

I would also refer to the eleventh page of this exhibit, which is the J. M. Huber Stultz Federal

Well No. 1, which has the 8-5/8ths inch casing set at 4330 feet and the long string is set at 10,400. The long string has cement. The bottom -- the lower portion of the cement, the top is at 9750 feet.

Later it was squeezed from 5472 feet to 7480 feet, so the interval from 5472 to 4330 feet does not have cement behind the pipe, the 5-1/2 inch pipe, and is therefore open in the San Andres zone.

The next one, which is page number twelve of that packet is the Union Oil Company "A" Federal Well No. 1, which is located at 766 feet from the south and east lines of Section 12, a southwest offset to the proposed disposal well.

The top of the cement on the long string of the pipe is at 7680 feet; the intermediate casing is set at 4620 feet, so therefore there is no pipe, no cement opposite the 5-1/2 inch pipe in the interval from 4620 to 7680 feet.

I mentioned these three wells because these are the wells that the Commission staff was concerned about when this application was filed for administrative approval. I will, however, explain why we feel that this is of no consequence, the fact that these wells do not have that cement across the pipe in that interval.

Q Mr. Nutter, would you now refer to what has been marked as Exhibit Number Five and identify and explain it?

A Exhibit Number Five is a summary of certain information on the propose operation. We expect that our average rate of disposal would be 320 barrels of water per day with a maximum rate of 1000 barrels per day.

If you turn back to Exhibit Number One, Mr. Examiner, you will see that the middle triangle in Unit M of Section 6 is a salt water disposal well that is operated by the J. M. Huber Corporation and they're presently disposing of salt water into that well; however, the formation is starting to fill up. We have a maximum pressure limitation on the well for disposal purposes and it is approaching that maximum pressure.

So rather than exceed the pressure that's authorized in that well, we're seeking to get approval for this additional source of disposal. At the present time only about 320 barrels would go into the well but, maybe, later on, if the well in Unit M of Section 6 refuses to take water completely, then our maximum rate of injection would go up to 1000 barrels of water per day.

The disposal system would be a closed system. Our average injection pressure would be 100 pounds and we do not anticipate that the pressure would go over 900 pounds; however, if we perforate in the lower section of perforations that we're proposing, in the lower section only, the maximum rate under the Commission's rule of thumb for disposal pressures would be 1168 pounds.

If we perforated on the -- in the upper

section that we're also proposing to be perforated later, we would be limited to -- that -- the uppermost perforation then would be 4630 and our maximum pressure would be 926 pounds.

So we feel that our maximum pressure is always going to be within the limits that the Commission would establish.

The formation water from the Lower Wolfcamp formation is being disposed of in the San Andres formation in the three wells that are identified on Exhibit One by the red triangles. There appears to be no compatibility problems with the Wolfcamp water and the native San Andres waters that are in those wells.

We've attached an analysis, which we'll get to later, of the waters that are in the San Andres formation in Lea County. We've also got some attachments for the fresh water wells that are in the vicinity.

Now the disposal, as I mentioned, would be into the San Andres formation. The top of the San Andres formation in this particular well is at 4555 -- 4552 feet. The top of the Glorieta is at 6200 feet. So all of our disposal would be into the San Andres formation.

The injection or disposal of salt water into the proposed interval will not affect the shallow fresh water sands that are overlying this area.

The available geological and engineering data has been examined and there isn't any evidence of any

faulting that would allow passage of the water from the San Andres into the lower -- into the upper fresh water-bearing sands.

Q Now would you refer to what has been marked as Exhibit Six and identify and explain it, please?

A Exhibit Six is the log of the Cabot "Q" State Well No. 1, the proposed salt water disposal well. The log interval depicted on Exhibit Six is only that lower portion of the San Andres that we propose to perforate initially.

You'll see that the perforations are proposed to be made in intervals that have 10 percent porosity, or more. So we feel that this zone will take considerable quantities of water but may not, over a period of years, contain all of the water, so therefore, we're asking for the additional authority from 4630 down to this interval right here. There are some poroous sands above that we would eventually perforate, we believe.

Q Now if you'll refer to what has been marked as Exhibit Seven and identify and explain it.

A Yes. Exhibit Seven is a laboratory water analysis by Martin Water Labs. It -- at the time this was -- there were two samples sent to Martin and sample number one is immaterial to this case. This was an analysis of some water that was being used for drilling purposes. So just disregard sample number one and we'll look at sample number two, which is the produced Wolfcamp water in this

area.

You'll see that the chlorides are not really high for oil well water, only 15,979. The total dissolved solids are 32,057 parts per million. We don't anticipate that there would be any problem, as I stated before, with the compatibility of these waters with the San Andres waters. We're going into the San Andres and on the second page of Exhibit Number Seven we show the quality of the San Andres waters, where, actually, we would be improving the quality of the San Andres waters by going into the San Andres with this disposal water, because, as I mentioned, the chlorides are 15,979 parts per million, whereas, the average chlorides in the San Andres formation in the Vacuum and West Lovington Moore and Maljamar -- and Moore Pools are well over 100,000 parts per million.

I don't know how the Hobbs East Pool has chlorides of only 6600, but that's not in this vicinity, anyway.

But the chlorides range up to 151,000 parts per million in the San Andres in Lea County, so we're not going to be deteriorating the quality of any water that's in the formation we would be disposing into.

Q Would you now refer to Exhibit Eight and identify and explain it, please?

A Exhibit Eight is a two-sheet exhibit. This is an analysis of fresh water taken from two windmills.

The first page of Exhibit Number Eight is

from a windmill that's approximately 7/8ths of a mile east of the proposed disposal well.

We see that the chlorides in this well are 61 parts per million. There is considerable hardness; it's 224 parts per million as calcium carbonate; however, the water is of pretty good quality. It has a total dissolved solids of only 490.

The second page of this exhibit shows that the chlorides in this well are slightly -- are less than the chlorides in the previous well but the carbonate hardness is greater, so the well has a total dissolved solids of 475, which is slightly better than the previous well.

This well is 3/4 of a mile to the west of Cabot "Q" State No. 1, so I think by having a well to the east and a well to the west of the disposal well and knowing that the migration of water through the Ogallala formation, which is what these wells, these windmills are producing from, we would -- it would be easy to determine if there was any leakage from the well into the Ogallala, because you've got a marker well east and west and the migration of the water is from west to east.

Q Mr. Nutter, I believe you stated earlier that this -- the application started out as an application for administrative approval of a salt water disposal well.

A Yes, sir.

Q And in connection therewith, was the

notice given to the offset operators?

A Yes, notice was given to the offset operators. That is contained in Exhibit Number Nine.

Q Now, just -- and one other question, and was this notice also given to the public generally by publication in --

A Yes, sir.

Q -- the newspaper?

A Notice was given to the public by publication in the Lovington Daily Leader on January the 11th, 1985.

I would note at this point that the proposed disposal zone was stated as being from 4630 feet to 6050 feet, which is the overall interval that we're seeking here today.

Also notice for this hearing was published by the Oil Conservation Division and states that the injection would be from 4630 to 6050.

We have also furnished the complete copy of this application to the State Land Office and discussed the application with --

Q Now, would you --

A -- Land Office personnel.

Q -- identify further what has been marked as Exhibit Nine and identify -- identify it?

A Yes. The first page is a copy of the notice to Union Oil Company of California, an offset opera-

tor to the west.

The second page is a copy of the letter that was given to Great Western Drilling Company, the offset operator to the east.

The third page is a copy of the affidavit of publication from the Lovington newspaper.

Q Now, Mr. Nutter, would you refer to what has been marked as Exhibit Ten and identify it and explain that exhibit?

A Exhibit Ten shows the three wells that were identified with the red triangles on the -- on Exhibit Number One. These are active disposal wells. Disposal is taking place today in each of these three wells.

The second well from the right is our proposed disposal well.

Now you'll see the Featherstone Humble "X" 1, on the left side of the exhibit, is disposing in the interval from 4600 to 6000 feet.

The Huber Stultz State No. 1 has authorized disposal from 4660 to 6404 feet.

The Union Gulf Federal No. 1, on the righthand side of the exhibit, has disposal into perforations and open hole in the overall interval from 4621 feet to 6583 feet.

Now the overall interval that we're seeking today is highlighted in a darker blue than the rest of the shading and would be in perforations from 4630 feet

to 6050 feet.

The point that I'm trying to make is that we're seeking to dispose of water into a zone that is already being flooded by three different wells in the immediate vicinity and we don't feel that the additional disposal into this one well is going to present any problem.

There are three wells that were -- that I mentioned, the sheet number six, sheet number eleven, and sheet number twelve, in the packet of exhibits -- of schematic diagrams of the wells, Exhibit Number Four.

Well, those wells had, for instance, Well No. 6, which was -- or the sheet number six in Exhibit Number Four, had no cement from 4576 feet to 5960 feet.

Well, this is the same interval that's being injected to in the other three wells and would be the same interval that we're injecting to in this well.

The eleventh well, I believe it is, on the -- on -- in the packet, no, it's the twelfth well, the twelfth well, is open from 4620 to 7680 feet.

Well, this is the same overall interval that we're proposing to dispose of, except that you do have Abo, some Abo down below the Glorieta there that is open, but there's no fresh water in the Abo, anyway, so even if water did get down into there, it would be no problem at all.

And, again, that zone is being disposed into in the three other wells.

So we feel that there really is no problem, no -- the water is not going to leave the disposal zone and go anywhere. It certainly isn't going to get into the upper fresh water because all of these wells in here have adequate -- as you go through the Exhibit Number Four and look at the casing and cementing program for the intermediate, in every case it's set to the approximate top of the San Andres, and there's not going to be -- and all of the -- all of the intermediate strings have been well cemented within the half mile radius of the disposal well.

So there's no problem of water migrating from the San Andres into the shallower fresh water sands.

Q Mr. Nutter, would you now please refer to what has been marked as Exhibit Number Eleven and identify and briefly explain these exhibits?

A Yes. Exhibit Number Eleven is a packet. It contains three different orders. These are the orders that authorize disposal into the three wells marked with the triangle on Exhibit Number One.

Now the first one is Salt Water Disposal Order Number 104. It was approved back on July the 24th, 1969. It approved disposal from 4600 feet to 6000 feet in the Featherstone Humble "X" No. 1 Well, which is the northernmost well on Exhibit Number One with a triangle around it.

There is no pressure limitation, you'll note, in this order, because this was entered before the

days when the Division established a pressure limitation for salt water disposal.

The second order is Salt Water Disposal Order Number 230. It was entered by the Commission on October the 2nd, 1980, and approves disposal into the Huber Stultz State Salt Water Disposal No. 1 in Unit M of Section 6. That's the triangle that's directly north and approximately 3/4 of a mile away from our proposed disposal well.

Disposal is approved to go into the San Andres from 4660 to approximately 6404 feet.

There is a pressure limit on this well, being 930 pounds per square inch. That's measured at the surface.

The third order in the packet is SWD No. 254, approved March 14th, 1983, and approves disposal into the San Andres and Glorieta formations from 4621 to 6583 feet in the Union Gulf Federal No. 1-12, and it has a pressure limitation of 924 pounds.

Q Mr. Nutter, do you feel that the granting of this application and the injection of water in this well will impair the correlative rights of any of the offset operators?

A No, it wouldn't impair anyone's correlative rights.

Q Do you think the granting of this application would be in the interest of conservation and prevent waste?

A Yes, it would -- it would be in the interest of conservation and prevent waste because it will enable the operator to produce his wells to a higher -- to a higher level of depletion than would otherwise be permitted, and it will not cause any waste of fresh waters.

Q And I think you've heretofore stated that in your opinion this granting the application would certainly not contaminate any -- contaminate any fresh water.

A No. I don't believe there's any chance that this would contaminate fresh waters.

MR. JENNINGS: We would now offer -- or no, excuse me.

Q Mr. Nutter, were Exhibits Numbers One to Eleven -- Number One to Ten prepared by you or under your supervision?

A Yes, they were, either that or they had been studied by me and I'm in complete agreement with the contents thereof.

Q And was Exhibit Number Eleven copies of orders of this Commission which were entered in the orginary course of business?

A Yes, they are.

MR. JENNINGS: We offer Exhibits Number One through Eleven, Mr. Examiner. We have nothing further at this time.

MR. STOGNER: Exhibits One through Eleven will be admitted into evidence.

MR. STOGNER: Thank you, Mr. Jennings.

CROSS EXAMINATION

BY MR. STOGNER:

Q Mr. Nutter.

A Yes, sir.

Q What is the proposed packer setting and tubing size?

A The tubing size is 2-7/8ths. The packer would be set at 5800 feet on the initial completion.

Later on, when we perforate up above to 4630, the packer would be set immediately above 4630 in that 5-1/2 inch liner. If you turn to the fourth page of the schematics, you see the top of the liner is at 4057 and the 9-5/8ths inch casing is at 4630, so the perforations would be below the shoe of the 9 -- of the 9-5/8ths inch casing.

So I would estimate we would probably set our packer in that event at approximately 4400 feet, when we perforate the upper section of -- of the San Andres.

But initially it would be set down at 5800 feet, with plastic-lined tubing set at -- 2-7/8ths inch plastic-lined tubing set in that packer.

Q When you first set it down there and open up the bottom perfs, how long do you propose before they move up the hole?

A It depends on how long this other well that's north of here will continue to take the water. We're going to use it as long as it will continue to take water.

Q However, you're still seeking for the whole interval.

A Yes, sir, we would seek approval for the entire interval. We could make the approval contingent upon specific notice to the Commission when we go in and perforate that, if you would like.

Q Thank you, Mr. Nutter.

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

Are there any further questions of Mr. Nutter?

CROSS EXAMINATION

BY MR. TAYLOR:

Q Mr. Nutter, is there any production from this well currently?

A No, it is -- it is shut-in now.

It was -- it was proposed to abandon the well and then they decided, well, since this other well was starting to load up, they'd go ahead and convert it to salt water instead, but it has been depleted in the Wolfcamp.

Q Okay. Just let me talk to Mike here a second.

Mr. Nutter, just to clarify the record, I

see on your Exhibit One, I believe it is, your map --

A Uh-huh.

Q -- Superior is listed there for part of that. Are they no longer an operator?

A The Superior leases that are shown here are all Huber leases at the present time.

Q Okay, so the only operators there are Union and Huber and --

A And Great Western.

Q -- Great Western.

A Yes, sir.

Q And your letters indicate you've notified them.

A Yes, sir.

Q Thank you very much.

MR. STOGNER: Are there any further questions of Mr. Nutter?

If not, he may be excused.

Mr. Jennings, would you please supply me with a rough draft of an order?

MR. JENNINGS: Yes, sir.

MR. STOGNER: Thank you, sir.

Is there anything further in Case 8493?

If not, this case will be taken under advisement and we'll take a fifteen minute recess.

(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. 8493 heard by me on 27 February 1985.

Michael E. Stogner, Examiner
Oil Conservation Division