STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:	CASE NO. 12,265
IN THE MATTER OF CASE NO. 12,265 BEING REOPENED PURSUANT TO THE PROVISIONS OF DIVISION ORDER NO. R-11,328, WHICH ORDER AUTHORIZED OXY USA, INC., TO CONVERT ITS GOVERNMENT "AB" WELL NO. 9 (API NO. 30-015-27964), LOCATED ON THE SURFACE 330 FEET FROM THE NORTH LINE AND 230 FEET FROM THE EAST LINE (UNIT A) OF SECTION 10, TOWNSHIP 20 SOUTH, RANGE 28 EAST (BEING APPROXIMATELY 15 MILES EAST OF SEVEN RIVERS, NEW MEXICO) TO A SALTWATER DISPOSAL WELL BY INJECTION IN THE PERFORATED INTERVAL FROM APPROXIMATELY 6378 FEET TO 6619 FEET INTO THE OLD MILLMAN RANCH-BONE SPRING ASSOCIATED POOL	

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

April 5th, 2001

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, April 5th, 2001, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

* * *

I N D E X

April 5th, 2001
Examiner Hearing
CASE NO. 12,265

* * *

E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	5	20
Exhibit 2	9	20
Exhibit 3	12	20
Exhibit 4	13	20
Exhibit 5	14	20
Exhibit 6	18	20
Exhibit 7	19	20

* * *

A P P E A R A N C E S

FOR THE APPLICANT:

KELLAHIN & KELLAHIN
117 N. Guadalupe
P.O. Box 2265
Santa Fe, New Mexico 87504-2265
By: W. THOMAS KELLAHIN

* * *

WHEREUPON, the following proceedings were had at 9:10 a.m.:

EXAMINER CATANACH: At this time we'll call Case 12,265, Reopened, which is in the matter of Case Number 12,265 being reopened pursuant to the provisions of Division Order No. R-11,328, which order authorized OXY USA, Incorporated, to convert its government "AB" Well No. 9 located 330 feet from the north line and 230 feet from the east line of Section 18, Township 20 South, Range 28 East to a saltwater disposal well by injection into the Bone Spring Associated Pool at a depth of 6378 to 6619.

Call for appearances in this case.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of the Applicant, and I have one witness to be sworn.

EXAMINER CATANACH: Any additional appearances? Okay, will the witness please stand to be sworn in?

(Thereupon, the witness was sworn.)

RICK FOPPIANO,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. For the record, sir, would you please state your

name and occupation?

A. My name is Rick Foppiano, and I'm senior advisor for regulatory affairs for OXY USA and other OXY entities.

Q. In addition, Mr. Foppiano, you're a petroleum engineer?

A. That's correct.

Q. You testified before Examiner Ashley back in October of 1999 concerning this Government 9 disposal well?

A. That's correct.

Q. And you're back before Examiner Catanach concerning reporting the status of that well and the compliance with the provisions of the previous order?

A. That's correct.

MR. KELLAHIN: We tender Mr. Foppiano as an expert witness.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Kellahin) Mr. Catanach was not involved in the original case, Mr. Foppiano, so let's take a moment and review the matters so that he will have a current recollection of where this project starts. If you'll take a moment and let's unfold Exhibit Number 1, identify for us what is Exhibit Number 1. What are we looking at?

A. Exhibit Number 1 is a land plat of the area, and it contains a lot of information. I'll just run through it briefly, if that's okay.

It's called "Zones of Production", and it's centered around the Government AB 9 well, which is the subject of the Application. As you can see, there's a variety of colors and information. The wells are denoted by the operator and the well number and lease name, and then they're color-coded as to the zones they have produced from in the area. And then you can see on the bottom, or below the well symbol, is a notation as to the zone the well is currently producing from.

And in particular you can see there are a variety of leases in Section 2, there are several state leases there. In Section 3 there are a couple of federal leases there. One is the Government S lease and another is another federal lease in the northwest quarter.

In Section 10 and Section 11 is the Federal AB lease, and also Section 11 contains a couple other government leases.

Q. All right. When we look at the disposal well, the Government 9, is OXY the operator of all the wells within the half-mile radius of review area?

A. That's correct, you can see the Government AB 9 in the northeast quarter of Section 10, and then the circle is a half-mile radius centered on the bottomhole location of the Government AB 9, and you can also see that OXY operates all the wells within that half-mile radius of

exposure.

Q. At the prior hearing of this matter, we identified for the Division what is characterized as two problem wells. Do you remember that?

A. That's correct.

Q. Let's identify for Examiner Catanach where those two problem wells are on this exhibit.

A. Okay, the two problem wells -- We call them problem wells because they were constructed and cemented in such a way that cement did not cover the Bone Springs zone.

The proposed operation here, which has now been undertaken, was to take produced water in the area where we are producing Bone Springs water, and to reinject it back into the Bone Springs formation utilizing the Government AB 9 as the injection well to do that.

Q. All right, what are the problem wells?

A. And the two problem wells that were the subject of the order are in Section 3, the southeast quarter, you see the wells that are very close together. The one that is colored in blue, the OXY USA, Inc., Number 2 Government S well, that's a Winchester-Morrow completion, a deep gas well.

Q. That's one of the two problem wells?

A. One of the two problem wells.

Q. All right, where's the other one?

A. The other one is in Section 10 at the very edge of the half-mile circle. It's a well that is highlighted in yellow, well symbol is in yellow, and it's the OXY USA, Inc., Number 2 Government AB Well, and it's completed in the North Burton Flat-Wolfcamp Pool.

Q. All right.

A. Neither of those two wells have cement behind the 5-1/2-inch casing, across the Bone Springs zone.

Q. The order references a monitor well. When we come up to the OXY Government S2 well, there's a well just north of it, very close to that well. Do you see that?

A. Yes.

Q. Is that the monitoring well?

A. Well, actually we have several monitoring wells. All the wells that are completed and producing out of the Bone Springs Pool we consider to be monitoring wells. We're monitoring each of those wells.

But in the particular case of one of the problem wells, the Number 2 Government S well, we have a well that is very close to it, producing from the Bone Springs so it can be considered almost a monitor well for that particular problem well and where we'd be able to detect any kind of change in the Bone Springs right there, next to where the Government S2 is completed.

Q. Before we get to the terms and conditions of the

current order, let's illustrate for the Examiner the relationship of the disposal well to the problem well. If you'll turn to Exhibit Number 2, let's look at that.

A. This Exhibit Number 2 is essentially the same exhibit that was utilized in the original hearing to show the construction situation for all the wells within a half mile that are currently producing and haven't been plugged. And I call it a cross-section; it's centered on the Government AB 9, is the well in the middle.

And it shows the wells and their distance from the Government AB 9, all the wells, as I mentioned, that are currently producing, what zones they're currently producing out of, be it Morrow, Wolfcamp or Bone Springs. And it shows the surface, the intermediate casing, the long string casing, the perforations and where the cement is located.

And you can see from this depiction the two problem wells that are the subject of the hearing. To the left, the Government S2 is the Morrow, the deep gas Morrow well. And you can tell by where the top of cement at 7400 feet, does not reach up to the Bone Springs, located around 6600 feet there.

And then to the right, the Government AB 2 well, completed in the Wolfcamp, and you can see that the top of cement by temperature survey there is 7600 feet and not

high enough to cover the Bone Springs there.

Q. Okay. You were aware at the time of the original hearing that the Division usually requires problem wells to be cured, if you will, by the remedial action of placing sufficient cement across the injection interval to isolate the casing from the formation, correct?

A. Yes.

Q. Did you obtain from the Division and exception to that normal practice?

A. Yes, we think the order basically granted an exception to that normal practice, because of the special conditions and situation that occur in this particular case.

Q. All right. Let's describe for Mr. Catanach some of the special circumstances, one of which is that you did additional calculations that were reviewed by Mr. Ashley concerning the area to be affected by injection into this disposal well?

A. Correct.

Q. There's a name associated with that type of calculation. What is it called?

A. It's called "zone of endangering influence" calculations.

Q. As a result of that calculation, what does it demonstrate?

A. The calculation, which was done at the request of the Division, revealed that the injection, based on the reservoir parameters that exist in the Bone Spring, would not have much effect beyond a short distance from the wellbore.

In fact, it showed that it did not increase the pressure in the Bone Springs to a level that exceeded a hydrostatic column of water gradient beyond a hundred feet from the wellbore and that it didn't even have an appreciable increase in the Bone Springs reservoir pressure, period, beyond 1000 feet from the Government AB 9. And as you'll note, the two problems wells are well beyond 1000 feet from the Government AB 9.

So basically what it showed is, in the Bone Springs Pool, in the area of the two problem wells, the pressure increase in the Bone Springs as a result of injecting into the AB 9 was basically negligible.

Q. Based upon that presentation, then, the Division issued approval for injection in the disposal well, true?

A. Correct.

Q. Subject to certain conditions and limitations, correct?

A. Correct.

Q. Has OXY satisfied all the conditions and limitations within the order?

A. We have.

Q. Let's summarize for Mr. Catanach those provisions. And I'll show you for purposes of that question Exhibit Number 3. This is the order issued. If you'll turn with me to the ordering portion, starting on page 6, summarize for us the type of conditions the Division imposed in order to utilize this well as an injection well.

A. Starting with paragraph (6), is that where you want me to start?

Q. Yes, sir.

A. Okay. Paragraph (6) requires that the Government AB 9, the S2 and the other wells, the AB 2, be equipped with pressure devices and that the pressure be recorded between the 5-1/2-inch casing. And it says it will be equipped with zero to 1000 p.s.i. pressure gauges.

Q. All right, has all that done?

A. To the best of my knowledge, yes.

Q. All right. Then there's some reporting and -- some recording and reporting requirements in paragraph 7. Summarize for us what those are.

A. In paragraph 7 there are several requirements to detail the monitoring of the production data from the Bone Springs well -- that's paragraph (a), which it says we will "perform and record monthly well tests", and the purpose of

that is obviously to monitor the oil and gas water production.

And then -- that says paragraph (d), I don't know what happened to the other paragraphs. But the next paragraph on this order is paragraph (d), and it says that we'll observe and record pressures on the annulus in the S 2 and the AB 2 one a week, and that's been done, and that we'll record the injection rate and pressure on the AB 9 once a week, that's been done, and that we'll report all these observations to the District Office, and that's been done. And there are some exhibits that follow that detail that compliance with that monitoring program.

Q. All right, let's go through those documents, Mr. Foppiano. If you'll start with Exhibit 4, what are we looking at with Exhibit 4?

A. Well, Exhibit 4 is just a chronology to basically bring the Division up to speed with what happened after the order was issued. The order was issued in February of last year, and right after the order was issued, we commenced the requirements to comply with the federal regulations regarding archeological surveys and right-of-way requirements.

And quite honestly, we encountered a lot more delays and difficulty in securing the necessary approvals from the federal government than we had anticipated. The

result was, it took basically -- well, it took a little over six months to get the necessary approvals from the feds to be able to go ahead and start the construction of the facilities on the AB 9 and to lay the flow lines or to lay the transfer lines from the two batteries, the Government S battery and the AB battery, over to the AB 9.

And we commenced that work to convert the AB 9 to injection service in January of this year and put the well on injection service at the end of January there, and it's been on injection service continuously since then.

Q. All right. At this time, then, there have been three monthly reports --

A. Yes.

Q. -- in compliance with the Division order for this well?

A. That's correct.

Q. Let's turn to Exhibit 5 and look at the first of those reports, and let's take it in the sections of the report, starting with the monthly test.

A. The next exhibit, which is Exhibit 5, are the completed AOR monitoring reports which were required by the order, and the report is broken down into several sections.

The first section is titled "Monthly Well Tests". And basically what this is is a recording of the well tests on the Bone Springs wells that are -- as you can see right

there, the date, the oil, the water and the gas.

The primary reason for recording that is to evidence that we are monitoring the water production on those wells so that we can detect when the water production exceeds the level of 100 barrels of water per day, at which point the order requires us to immediately shut down injection into the AB 9 injection well.

The next section are the "Weekly Pressure "Readings" from the two deep gas wells, the Government S2 and the Government AB 2. And you can see the date, and the pressure is monitored there. And this particular first page of the report is the baseline data that was taken prior to commencing injection.

The next block down is the "Weekly Injection Well Status", which is basically a report on the Government AB 9 as to what pressure it's injecting at and the volume that's being injected.

And then the last block is a certification by the person filling out the form that the information is true and correct.

Q. We have at least three triggers, if you will, to find out if the injection well is adversely affecting either of the problem wells, and the first one would be to look at the water volume reported on a monthly basis for the problem wells and to see if the water volume increased.

A. Correct.

Q. Did that occur as of this point in any of the months reported?

A. No.

Q. The other one would be to see if you are pressuring up either one of the problem wells.

A. That's correct, pressuring up the annulus of --

Q. That's right, pressuring up the annulus on the problem wells using this baseline pressure.

A. Correct.

Q. Has that occurred?

A. No.

Q. In addition, we can go back down to the injection well and to see whether the injection rates, volumes and pressures are changing dramatically to indicate that you've pressured up the reservoir and therefore may be pressuring up the problem wells?

A. That's correct.

Q. Do we have a point in time where you even pressured up the reservoir?

A. Well, obviously what we have to do is fill up the reservoir voidage created by production that occurred on the Government AB 9 well before it was converted to injection service. And as you can see, and as is the case today, we're continuing to inject on a vacuum, we've not

achieved fill-up.

And the big unknown here, which was the primary reason for undertaking this project, is, we really do not know if we can push any fluid in this reservoir at all. And so this is really a test, in addition to being a disposal project for produced water and reducing our disposal costs so we can extend the economic life of existing production.

It also is a pilot to see if the Bone Springs can be flooded. There's a substantial oil target there that, if this indicates that we can push some fluid in the reservoir, then we'll look very, very closely at the possibility of a secondary recovery project.

But at this point we are waiting for the well to get enough volume in the pore space around the Government AB 9 in the Bone Springs reservoir, and once fill-up is achieved we really do not know if the well will just pressure straight up and basically not take any more fluid, or we're able to put some fluid in there and push volumes through the reservoir.

So it's still a big unknown as to what's going to happen in --

Q. In your opinion --

A. -- pressure zone.

Q. In your opinion, do the terms and conditions of

the current order continue to be appropriate to meet the future foreseeable circumstances involved in the reservoir for these wells?

A. Yes.

Q. Do you see any reason, based upon events that have transpired since the order was issued, to change any of the terms or conditions of the order?

A. No, I do not.

Q. Do you have an opinion whether the order continues to be appropriate under the circumstances of this case?

A. I think the order continues to be appropriate and shouldn't be changed.

Q. Let's look at a different way you've tabulated the data. If you'll look at Exhibit 6 and 7 for us, starting with Exhibit 6, describe for us what you're depicting.

A. Exhibit 6 and 7 is basically -- or it actually is taking the data from the previous exhibit, Exhibit 5, the monitoring data, the well-test data and the pressure data, and it's trying to show it in graphical form. It just is trying to show the same thing, because the data is a little bit easier to see where things are in relation to the triggers that cause us to immediately shut in injection.

And you can see from Exhibit 6, which is the

pressure monitoring data that we've captured on the two problem wells, and you can see to the left is -- the Y axis is the production intermediate casing pressure that we're observing, and the X axis are the dates.

And what it basically shows is, the monitoring, as was required, commenced prior to injection, which occurred -- injection started on the 30th of January. And you can see we recorded baseline pressures in red as the baseline pressure for the Government S2, in green is the baseline pressure for the AB 2. And then injection commenced on the 30th of January, and you can see the data following after that.

There has basically been no change to the pressures that have been monitored. We have not had any indication of any change in the pressure in the annulus up to this point.

And I've also shown with the dotted lines the shut-down points. So you can see that when the green curve on the bottom reaches the trigger point, that's the shut-down point, and the same is true with the red. So it's 50 p.s.i. above the baseline pressure, so that's why there's two different triggers there for each -- you know, specific to the problem wells.

And then Exhibit Number 7 is the same kind of depiction. The date axis, the X axis, is the same as the

previous exhibit, and it shows water production on the Y axis, and you can see that all the well tests and the particular wells they reference. We're still -- We haven't seen any change to the water production in the Bone Springs, basically no effect in the Bone Springs, due to the injection in the Government AB 9.

Q. And OXY continues to control the operation of all the wells involved within this area that we've just discussed?

A. That's correct.

Q. So they operate and control the problem wells as well as the injector and the monitor wells?

A. That's correct.

MR. KELLAHIN: That concludes my examination of Mr. Foppiano.

We move the introduction of his Exhibits 1 through 7.

EXAMINER CATANACH: Exhibits 1 through 7 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Foppiano, have you talked to anybody in Artesia about the reports that you're filing with them?

A. No, sir, I have not.

Q. I'm not sure that they know what they're getting

in these reports, and I'm not sure -- It might be a better idea to file these reports with the Santa Fe office. I might change that provision, put that in the order.

When you did your original zone of endangering influence calculation, you stated that at 1000 feet from the wellbore there was virtually no increase in pressure. Is that what you --

A. Yes, and I can refer back to my exhibit, if you'll allow me.

Yes, I have the information in front of me now.

Q. Okay. I guess it's your testimony that there's virtually not going to be any increase in pressure a distance of 1000 feet from the wellbore?

A. That's what the zone of endangering influence calculations showed. Obviously there are some assumptions based on those calculations, and we used the best, most conservative data we could to try to come up with a pressure profile, but that's what the calculations show.

Q. Okay.

A. And I might that -- Well, no, it doesn't add anything to it. Never mind.

Q. Does that calculation involve inputting a time factor and a volume factor for that wellbore? Like how long a period are we talking about?

A. I believe it does, if I recall it correctly.

Q. And do you recall what that time period was?

A. Yes, I have a table that shows the time period utilized in the calculations --

Q. Okay.

A. -- and it was one year.

Q. That was one year, okay. And did you use a constant volume in that calculation?

A. I used a constant injection rate.

Q. And what was that rate? Do you have that?

A. The rate was 192 barrels per day.

Q. Okay. Is that pretty much what you guys have been injecting into that well?

A. It is, but I'm not sure we have any information that indicates where the calculations are verified, essentially, because the zone-of-endangering-influence calculations assumed a pore space filled with injection fluid, and we are not at that point yet.

It basically assumes you have a fluid fill pore space and that you are already pushing fluid in the reservoir, and we are not even anywhere close to that because we haven't even filled the pore space up yet. It's a gas-saturated pore space with a little oil and probably some -- you know, and some water saturation. But it's primarily gas void that we're filling up down in the reservoir right now.

So in my opinion, the calculations -- We're only putting a hundred barrels -- or about 250 barrels a day, maximum, into the reservoir right now, only because that's everything we're producing from the Bone Springs. We have no idea how much it really could take, but it's taking it all on a vacuum now.

Q. Are you saying that the Bone Spring was essentially depleted in the vicinity of the wellbore?

A. That's my opinion, yes. It was very depleted, and that was one of the considerations for utilizing that particular wellbore, is that it really didn't have hardly any recoverable hydrocarbons left in it, in the area of the AB 9.

Q. Okay, so the Government AB 9 was a producing well before it was converted?

A. That's correct.

Q. Okay. The well, as I understand from your reports, is taking water on a vacuum; is that correct?

A. That's correct.

Q. Do you know how the trigger was arrived at, 100-barrels-of-water-a-day trigger was arrived at?

A. I think the monitoring program and the trigger were something that was suggested by us. The concept was suggested by us and reviewed with Examiner Ashley. And actually -- I'm trying to remember, I don't know if the

hundred barrels was what we proposed or we proposed a higher level and Examiner Ashley felt a lower level was more appropriate.

I know we proposed a higher pressure on the annulus of the two problem wells, and Examiner Ashley -- or the order reflected a much lower pressure. But it was the result of some discussions back and forth that we arrived at the monitoring program and then what we would do based on the monitoring program, what were the triggers, essentially.

Q. Okay. You don't anticipate the injection rate going up significantly in this well, do you?

A. It could, as we are -- as it's taking it on a vacuum, we're looking at other possibilities of water supply that we might be able to bring over to that well. Or there could be an increase in water production, which I don't anticipate that there could be from the Bone Springs, but there could be a slight increase.

So future conditions, I really can't say. But I don't think there's going to be a very significant increase in the volume that's being injected into the AB 9.

Q. Okay, but you are considering the possibility of bringing in additional water from other sources?

A. Other places where we operate wells in the immediate vicinity. And we don't know whether we're going

to do that, but obviously whatever we do would be in full compliance with the regulatory requirements and the federal requirements. But if it looks like it's something that makes good sense and -- we may try to do that, as long as the well is taking it on a vacuum.

EXAMINER CATANACH: Okay, I have nothing further, the witness may be excused.

Anything further in this case, Mr. Kellahin?

MR. KELLAHIN: No, sir.

EXAMINER CATANACH: There being nothing further, Case 12,265 will be taken under advisement.

(Thereupon, these proceedings were concluded at 9:47 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 12265, heard by me on April 5 2001.

David R. Catanach, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL April 11th, 2001.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002