STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

ORIGINAL

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

CASE NO. 14356

APPLICATION OF ENERGEN RESOURCES CORPORATION TO AMEND ORDER NO. R-10448 TO AUTHORIZE THE INJECTION OF WATER FOR PRESSURE MAINTENANCE OPERATIONS FOR THE WEST LOVINGTON-STRAWN UNIT, LEA COUNTY, NEW MEXICO.

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

September 3, 2009
Santa Fe, New Mexico

BEFORE: TERRY WARNELL: Hearing Examiner
DAVID BROOKS: Technical Advisor

This matter came for hearing before the New Mexico Oil Conservation Division, Terry Warnell Hearing Examiner, on September 3, 2009, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South St. Francis Drive, Room 102, Santa Fe, New Mexico.

REPORTED BY: PEGGY A. SEDILLO, NM CCR NO. 88
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I N D E X

A P P E A R A N C E S

For the Applicant: J. SCOTT HALL, ESQ.
Montgomery & Andrews, PA
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HEARING EXAMINER: Let's start with Case No. 14356. This is amended and readvertised. This is the Application of Energen Resources Corporation to Amend Order R-10448 to Authorize the Injection of Water for Pressure Maintenance Operations for the West Lovington-Strawn Unit, Lea County, New Mexico. Call for appearances.

MR. HALL: Mr. Examiner, Scott Hall of Montgomery and Andrews Law Firm of Santa Fe appearing on behalf of Energen Resources Corporation. And I have two witnesses this morning.

HEARING EXAMINER: Any other appearances? Will the witnesses please stand and state your name and be sworn?

MR. SAULSBERRY: Jerrald Salsberry.

MR. BONDURANT: Albert Bondurant.

(Note: The witnesses were placed under oath by the court reporter.)

JERRALD SAULSBERRY,

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

DIRECT EXAMINATION

BY MR. HALL:

Q. For the record, please state your name.

A. Jerrald L. Saulsberry.

Q. And Mr. Saulsberry, where do you live and by whom are you employed?

A. I live in Birmingham, Alabama, and I'm employed by Energen Resources.

Q. In what capacity?

A. I'm the chief reservoir engineer.

Q. Have you previously testified before the Division and had your credentials as a reservoir engineer accepted as a matter of record?

A. Yes.

Q. And are you familiar with the application that's been filed in this case and the lands that are the subject of the application?

A. Yes.

MR. HALL: At this time, Mr. Examiner, we offer Mr. Saulsberry as a qualified expert reservoir engineer.

HEARING EXAMINER: Mr. Saulsberry is so qualified.

Q. Mr. Saulsberry, does Energen seek to utilize the West Lovington-Strawn Unit Well No. 8-R for in injection operations in connection with unit operations for the West Lovington-Strawn Unit?

A. Yes.

Q. I want you to give the Hearing Examiner a historical summary background of the unit, its creation

and operations.

A. Okay. The West Lovington-Strawn is an oil reservoir and it's in the Strawn formation. It was discovered in 1992. It's a slightly undersaturated volatile oil field that has good permeability. The estimated original oil in place is about 20 million barrels.

In 1995, it was unitized for gas injection for pressure maintenance. And then there were two unit expansions, one in '97, and one in '98. As additional wells were drilled, the unit was expanded.

The gas injection started in 1995 and went through 2002, and then the gas injection was stopped. And since then, we produced cumulative oil of about 8.3 million barrels.

Q. All of these events are outlined on your Exhibit 1?

A. Yes, other than the 8.3 million barrels.

Q. What were the engineering concepts behind the original pressure maintenance project for the unit?

A. Well, because West Lovington oil is a volatile oil, which means it has a large amount of solution gas in it, that as the reservoir pressure would naturally deplete, a large amount of gas would come out of the oil, and there would be a very high oil shrinkage.

And so if you produced it on natural, just completion drive, the oil would have a high shrinkage and the geo margin would fill up rapidly and you'd produce a lot of gas. The gas would come out of the reservoir prematurely and would deplete the reservoir pressure.

So the idea was, was to inject gas at the top of the structure to maintain the pressure so that you kept the pressure up high and didn't allow all that solution gas to come out. And so, we injected gas at the top of the structure.

And the gas that was produced in the other wells would go to an MGL plant to take out the liquids. And then the dry gas would be injected back into the reservoir.

In addition to the dry gas, there was also some purchased gas to try to make up for it to keep that pressure constant.

Q. Were pressure maintenance injection operations first authorized by the Division's 1995 Order No. R-10448?

A. Yes, that's the authorization.

Q. Okay. What was the name of the location of the original injection well?

A. That was the Gillepsie No. 1, also now known as the West Lovington No. 7.

Q. If we look on your Exhibit 2, is that the well

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that's on here?

A. Yes, it is shown in the circle there.

Q. Okay. And what else does Exhibit 2 show us?

A. Exhibit 2 also shows the structure. And if you see right below the circle, that was a discovery well, and the injection well was right below it.

Q. It was in Section 1?

A. Yeah, Section 1. If you notice the contours, those are the top of the structure contours. And that is the high point of the reservoir. And then it goes down dip from there.

The triangle shows the well that we're going to convert to water injection, the 8-R. And the different -- I might be getting ahead a little bit, but the different colors show the unit expansion.

The yellow is the original unit, and then it was expanded and included the blue, and then the second expansion included the red.

Q. All right. Tell us what the approximate volumes of gas that were injected for pressure maintenance.

A. Approximately 13.1 BCF.

Q. And did those injection operations succeed in preventing premature dissipation of reservoir energy?

A. Yes. I believe it worked very well. If you turn to the next exhibit, Exhibit 3, that really shows the

production rate for the unit. It shows the oil, gas, and water, and also shows the gas injection volume, which is in purple.

And in addition, it shows the reservoir pressure which are the square dots. If you'll notice, during the gas injection period, the reservoir pressure was held fairly constant, and also, the oil rate went up some when we started the injection.

And the oil recovery in the field has been really good. It's been better than expectations. So I think it's been very successful.

Q. Now, has most of the injection volume been recovered back?

A. Well, we injected 13.1 BCF of gas, and since the end of injection, we have produced an additional 18.7 BCF after the injection stopped.

Q. All right. Tell us about the drive mechanisms for the reservoir.

A. It's a combination drive. It includes the solution gas. There's a secondary gas cap. There's some gravity drainage effects, and we've also found that there is a partial water drive support down dip.

Q. All right. With all of those mechanisms at work, is there any particular problem in adding injection water?

A. No, I don't think so. Because the water has been encroaching down dip, and it's been watering out wells over time as it's gradually encroached up the structure, and the 8-R has already watered out, it's not making any hydrocarbons. And so I think it's a good one to inject in.

Q. All right. And what is the purpose of the injection, what's the value to slow the rate of the decline and reservoir pressure?

A. Yes. I wouldn't call it pressure maintenance, but it would just slow the depletion rate.

Q. It will prolong the life of the unit?

A. Yes, it should prolong it.

Q. All right. And what's the status of the original injection well, the No. 7 well?

A. It is still producing.

Q. It's been converted to a producer?

A. Yes.

Q. Tell us why you selected the West Lovington-Strawn Unit Well No. 8-R as your injection candidate.

A. There's a few reasons. I already mentioned that that well is watered out and we wouldn't be losing any production from that. The well bore is good.

And the other thing is, if you look at Exhibit 4, Exhibit 4 shows the structure. And I have

wells colored blue. The ones that are circular and blue, those are completely watered out. And the square wells are wells that are still producing but they're producing at least a hundred barrels of water a day and they have a water cut of over 90 percent.

The one with the triangle on it, that's the 8-R that we want to inject water. And it's already watered out but yet it's not that far away from where the wells are that are still productive, so I think it will be an advantage to them.

Q. Are you able to estimate the incremental oil recoveries that you might expect from the proposed injection of the water?

A. No, I can't, because the reservoir is light in its life. It's down to about 800 pounds of pressure. We don't know what the saturations are of the reservoir. And with those combination drives, it's a very complex reservoir, and the fluids are complex too. So I really can't give you an estimate.

Q. Do you have sufficient confidence that you'll see positive results in order to justify the cost of this project?

A. Yes. I don't believe management would be proposing it if they didn't think we could get enough oil to make it economic.

Q. Okay. Will the substitution of water for gas enhance your project economics?

A. Yes.

Q. How will fluids be injected through the 8-R well?

A. Well, the reservoir, because of its high permeability and low pressure, it should take the water very easily. I would expect that the bottom hole pressure to inject it will be below hydrostatic. But there may need to be some pressure at the surface just to come over the pipe friction.

And one thing I didn't say was, that the rate of injection is going to be based on the water that's produced, because we're simply going to take the produced water and reinject it. And right now, that rate is around two or three thousand barrels a day.

We've got an upward trend, so we expect that to go up some, especially if we're reinjecting it. It could go up to 5,000 barrels a day.

Q. All right. In your C-108 application and the application for the hearing, you've indicated an average daily injection rate of 3,000 barrels, and a maximum of 5,000 barrels. Do you expect those parameters will be sufficient to allow you to inject the volumes that you are seeking now?

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A. Yes.

Q. Okay. At this time, does Energen seek any other relief than the amendment of Order R-10448 to authorize the injection of water in lieu of gas for the unit?

A. No.

Q. There's no other need to amend the unit agreement or unit operating agreement to change the track allocations?

A. No.

Q. Nothing else? All right. Were Exhibits 1 through 4 prepared by you?

A. Yes.

Q. In your opinion, Mr. Saulsberry, will granting Energen's application promote the interest of conservation and result in the prevention of waste and the protection of correlative rights?

A. Yes.

MR. HALL: That concludes my direct of this witness, and we would move the admission of Exhibits 1 through 4.

HEARING EXAMINER: Exhibits 1 through 4 are admitted. Questions, Mr. Brooks?

MR. BROOKS: No questions.

HEARING EXAMINER: Mr. Saulsberry, a couple of questions. You said your daily water rate was about 100

barrels per well?

THE WITNESS: Well, the total for the unit is around two or three thousand barrels. I think the --

HEARING EXAMINER: That's based on how many wells?

THE WITNESS: How many are producing, it must be -- well, between 10 and 20. I'm not sure what the exact number is. The 100 barrels a day of water was at -- I'm showing how the water influx is on there. I'm saying that some of the wells that have high water cuts are making at least 100 barrels a day. I think that's where the 100 barrels came from.

HEARING EXAMINER: All right.

THE WITNESS: Some of them are making 500 or 600 barrels, I think.

HEARING EXAMINER: When you did the economics on this, do you know what you were calculating for a barrel of oil?

THE WITNESS: What price for a barrel of oil?

HEARING EXAMINER: Price, yes.

THE WITNESS: No. We usually use a strip price and -- But I'm not the reservoir engineer that did that part of it, so I can't really say what he used.

HEARING EXAMINER: Okay. You said you may require some pressure at the surface to overcome the pipe

friction?

THE WITNESS: Yes, I believe so. I'm not sure if that would be the case, but it could be. Because if we're injecting 5,000 barrels a day through the tubing, it may take some pressure just to get that water in the tubing.

HEARING EXAMINER: I have no further questions.

MR. HALL: At this time, Mr. Examiner, I would call Mr. Al Bondurant to the stand.

AL BONDURANT,

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

DIRECT EXAMINATION

BY MR. HALL:

Q. Please state your name and place of residence.

A. My name is Albert Bondurant. I live in Birmingham, Alabama.

Q. By whom are you employed and in what capacity?

A. I'm employed by Energen Resources as a staff geologist.

Q. All right. Are you familiar with the application that's been filed in this case and the lands that are the subject of the application?

A. Yes, sir, I am.

Q. You've not previously testified before the

New Mexico Division?

A. No, I have not.

Q. Would you give the Hearing Examiner a brief summary of your educational background and work experience?

A. I graduated with a bachelor of science degree in geology from LSU in Baton Rouge in 1977. I worked from '77 to 1981 in Colorado Springs for Colorado Interstate Gas doing development geology related to underground storage fields, gas storage fields.

In 1981, I moved back to Louisiana. I was an exploration geologist for Terrico Oil Company working on the continental shelf from the Gulf of Mexico lease sales as an exploration geologist.

After that, I became an independent geologist and I was on retainer to several companies, including Kettington Oil and a couple other small ones there in Lafayette.

I was doing prospect generation in south Louisiana. My specialty was working detail mapping of nearly depleted oil fields and adding additional wells.

In 1987, I became an environmental geologist and moved to Birmingham, Alabama, and had my own company for seven years. And for the other time, worked as an environmental consultant doing soil and ground water

investigations at contamination sites. Did several projects involving underground injection of treated ground water and that sort of thing.

And in October of last year, I was hired by Energen Resources as a staff geologist.

Q. Now, your area of responsibility includes the Permian Basin in west Texas and eastern New Mexico?

A. That is correct.

MR. HALL: At this time, Mr. Examiner, we offer Mr. Bondurant as a qualified expert petroleum geologist.

HEARING EXAMINER: Mr. Bondurant is so qualified.

Q. Tell the Hearing Examiner what Energen is asking the Division to do in this application.

A. Basically, we want to convert the WLSU No. 8-R oil well to injection of produced water. And in the conversion of that, it will be a closed system and all water will be injected in preparation from 1,520 feet to 1,592 feet in the 8-R well, which is the permeable and porous portion of the Strawn Formation in that well.

Q. If you'll look at Exhibit No. 5, did you assist in the preparation of this C-108?

A. Yes, I did.

Q. Let's clarify one thing. If we look at the fifth page of the C-108, it's some of the narrative you

have prepared?

A. Correct.

Q. In our application, we ask for authorization to inject perforations at depths from 11,520 feet to 11,592 feet. In the second paragraph of that page, it indicates that the 8-R well penetrated the top of the Strawn porosity at a depth of 11,546. Can you explain that difference?

A. Yeah. The difference there is, the 8-R well is actually perforated up to 11,520, which is 26 feet higher than that number I have there. I'll show through a later exhibit the actual log from that well.

The best part of the porosity in the section starts at 11,546, and that's what we initially had perforated it. And just to pick up anything possible in the lower porosity section right above it, we have perforated that. And it is in the Strawn, and it is -- you know, we're not adding anything different. It's below the top of the Strawn marker and it's recognized as the same unit.

Q. So all these depths are contained within the unitized formation --

A. That's correct. And that's what we advertised. In the advertisement, it was only 11,520 to 11,592.

Q. Okay.

A. So it was just an inadvertent thing on my part. That's where I would pick the top of the porosity if I was doing a log.

Q. Let's turn to the C-108, the first well schematic. Is that the schematic for the 8-R, formerly the Snyder "S" Con No. 1?

A. Yes, it is.

Q. And one thing we should note on there, the surface location is reflected in the schematic; is that right?

A. That is correct.

Q. And the well has been sidetracked?

A. It was sidetracked. It was off by a little over a hundred feet. And all of that, the C-102, the directional survey, and all that information, the State has.

Q. Okay. And Page 6 of the C-108 is your area of review map, correct?

A. Yes, sir.

Q. It's also got the well location on there. And then the C-105 for the 8-R well is also below the well schematic, and we can find the bottom hole location for the sidetrack?

A. That is correct. Yes.

Q. And would that be 1,870 from the south line, and

859 feet from the west line?

A. That is correct. It's also shown on the area of review spreadsheet that lists all the wells that are within a half mile radius.

Q. Okay.

HEARING EXAMINER: That's Unit L?

THE WITNESS: Yes.

A. And again, the area of review document, that's a half mile radius for wells that penetrated the Strawn, and then there is a two mile radius for water wells that we see on there, and that's why there's two different circles on there.

Q. Now, the seventh page of the C-108 is the page just below your AOR map. What does that show us?

A. The spreadsheet?

Q. Yes.

A. Okay. Yeah, the spreadsheet includes all the wells in the half mile radius AOR. It includes all the Energen wells that have been drilled and/or abandoned that are within that radius.

Of those wells, you can see on the spreadsheet the AOR is listed as TA, it's temporarily abandoned. We're not currently producing out of it. The 8 was plugged and abandoned. There were several others. The 9 was plugged and abandoned, the 20 and the No. 2.

And then there is one other well in that unit that has an asterisk by it, the Cabot Carbon Company Warren Snyder No. 1, it is currently plugged and abandoned. It was not drilled into the Strawn, it was stopped in the perma phrase.

Q. All the other wells --

A. All the other wells were producers out of the Strawn.

Q. All right, all the Strawn penetrations in the AOR?

A. That is correct.

Q. Tell the Hearing Examiner how this interval of the Strawn was selected for injection.

A. Well, it was selected because it has the best porosity and permeability of the Strawn section. And in the AOR, this section that we want to inject into was the same section that we produced out of before it watered out.

Q. Okay. And let's look again at the well bore schematic for the 8-R. Can you discuss the casing and cementing for the well?

A. Yes. The surface casing, which is 13 and 3/8 inch casing, was originally set to a depth of 391 feet to protect the shallow ground water. It was cemented in place and the cement was circulated to the surface.

A second strain, which was the intermediate casing which was 8 5/8ths inch, extends back to the surface from a depth of 4,753 feet. It too was cemented in place, circulated to the surface.

Then the actual production casing, which is 5 1/2 inches, extends to the total depth of the well which is 11,887, and it, too, was cemented back to the surface.

So the casing there is in good shape. And of course, we will use production tubing inside of that. But it was sufficient to protect the shallow -- to protect the water aquifer, which is our main concern.

Q. If we could look at the profile for the original plugged well on the schematic, it indicates there was a casing collapse?

A. That is correct.

Q. And if you look through some of the other schematics, there's casing collapses indicated on them, too?

A. Right. Well, Energen has been proactive when -- where we have casing problems in these wells, we have either elected to -- or we've plugged and abandoned that section and have elected to either sidetrack it or drill a replacement well. And that would be our policy, again, to prevent casing leaks causing a problem.

Q. Okay. Again, this will be an open hole

completion?

A. No, it's not an open hole completion, the casing in the well will be perforated through the casing with tubing.

Q. All right. Let's elaborate a little further. How will liquids be injected, do you expect that the well will take water by gravity drainage?

A. That is correct. Viable water will be introduced into the well through tubing directly into the perforated section that is a cast iron bridge plug above the perforations.

And so the only interval open for injection will be those Strawn perforations. And like I say, the water -- not to elaborate on what our engineer said because he knows more about that than I do, but basically, there will be no additional pressure other than the casing friction and that sort of thing caused by the water actually going down the well.

Q. And the well will be equipped with a check valve?

A. Yeah, it will have a check valve to prevent backflow.

Q. Okay. Do you know what materials will be used for the tubing?

A. Yeah. The tubing is a poly lined tubing to

prevent corrosion.

Q. Okay. Now, will this be a closed system?

A. Yes, indeed. No other water will be introduced other than the produced water.

Q. Is there any reason to believe that the injection fluids or reservoir fluids are incompatible?

A. No, they're one and the same.

Q. Would you give the Hearing Examiner a brief overview of the Strawn formation?

A. The productive Strawn formation is a limestone. It was formed -- it's a middle Pennsylvanian limestone. It was formed by -- it's basically algal mounding, and basically an algal-type reef.

And the algae precipitated the limestone and it basically grows -- well, analogous to a reef situation of today. And as the limestone was exposed summarily to potentially fresh water, that sort of thing, it would develop secondary porosity. As the water would dissolve part of the limestone, it created a network of solution openings through the limestone which is basically the secondary porosity and permeability.

There is some intergranular, intercrystaline porosity within the limestone that could be either connected with some slight fracturing, and that sort of thing.

Our experience is, that there is not a lot of tectonic activity that resulted in a bunch of fracturings, it's mostly just the small fracturing within the secondary porosity of the Strawn. And where it's developed is extremely productive, where it's not, it's extremely tight.

Q. All right. Let's look at your geologic exhibits, 6, 7, and 8, your structure and well log, and then your cross-section.

A. There's three exhibits there. Okay, I'll take them a little bit out of order. I'll take the well log first. That is a copy of the neutron density log run on the 8-R.

And again, just to back up to what we said a little earlier, the top of the perforations in that well are at 11,520 feet, which is -- if you look on it, you've got one red line across it, STW, right at 11,500 feet, that's the top of the Strawn marker.

And then the next red line across there which is not labeled, that would be 11,520, and that's the top of our perforations.

And the third red line that has the porosity symbol on it, that was where we actually picked the top of the best porosity in the zone. The base of the porosity is also labeled right at 11,592.

Again, that is the interval, that entire interval is where we will be injecting, and that again, is the interval where we have produced out of this well.

Q. Okay. All these intervals are contained within the unitized formations of the Strawn?

A. That is correct. And if you'll notice on the neutron density curves, that's the red and blue dashed curves on the right-hand side of the log, you can see that the left deflection -- I'm not going to get into log analysis, but the left deflection of that interval is indicative of porosity.

And you'll notice that below that, say 11,600, those lines just run with the track straight down indicating very little or no porosity.

Q. Okay.

A. The structure contour map, which was Exhibit 6, first of all, the blue line across it, that is the actual line of cross-section which is shown on Exhibit 8. I'll talk about that in just a second.

The main things in there on the structure contour map are, down structure on the north side, there's a blue line that is labeled 7,627 feet subsea. That is the depth of the original oil/water contact that was determined in the field.

And as Jerry testified, there is some water

drive mechanism in it, so water influx has occurred from the north to the south as production has occurred.

And if you look to the southern part of the unit, it's around WLSU 7 and 5, there near the very top of the structure, it has a very nice structural feature there.

Part of the look of that is the result of that algal mounding. I mean, it basically reflects the extra reservoir thickness that has resulted from mounding, and a lot of times it makes little biscuit-looking features.

So the Strawn itself, if you'll look on the cross-section, the yellow zone highlighted is the Strawn porosity --

Q. That's your Exhibit A?

A. Yes, that's correct, the top of the Strawn. The Strawn marker is the top dashed black line, and the bottom dashed black line would be the base of the porosity section.

The dashed blue line is the oil/water contact, and it's 7,716 feet. And of course, it would have come up now and watered out some of these wells.

And the red dashed line at the bottom is the top of the Atoka, which is also productive in this area but it's not currently producing in any wells in the AOR.

The Strawn is encapsulated in low permeability,

low porosity shales, mudstones, and then the bottom part of it is just very dense grainstones, that limestone.

So it's trapped structurally, but also stratigraphically. So it makes an excellent reservoir, in my opinion, for -- If you're injecting any additional fluids, you can feel confident it's going to stay where you're putting it.

Q. So you're confident that the injection fluids will remain contained?

A. That's correct.

Q. Is there currently any nonStrawn production within your area of review?

A. Not in the area of review. There is shallow production in the area from the perma Penn section, and then there is some Atoka which is below the Strawn production in the area also and not currently producing within a half mile radius.

Q. Okay. And again, all of those wells are reflected on your spreadsheet in the C-108?

A. That's correct.

Q. And there are well bore schematics for each of those wells that support --

A. There are schematics for each well that is in the AOR.

Q. Are you confident that the available data was

sufficient to permit you to determine with some accuracy the casing depths and the cement tops and bottoms in all these wells?

A. Yes.

Q. Was there any evidence of casing leaks in any of the wells?

A. We have had casing leaks in some of our wells, and I mentioned earlier that they were properly abandoned, and some of the ones we sidetracked or run -- drilled a replacement well. But none are currently leaking because we took care of it.

Q. Is Energen satisfied that the conditions of all of the wells within the area of review are such that none of them will act as a conduit for the transmission of injection fluids to fresh water?

A. That is correct.

Q. Okay. Let's talk about all the fresh water aquifers within the area of review.

A. All right. The primary drinking water aquifer in the area is the Ogallala formation that's present from 50 feet to I guess 250 feet below ground surface.

Is it protected by the casing program in all those wells, at least two strings of casing. The original surface casing in there and intermediate casings were set and cemented into place to protect the Ogallala from being

in contact with salt water.

I'm going to jump ahead. We sampled five water wells that were present in the two mile AOR as required. We sampled them back in March.

Q. And that's reflected in the --

A. Right, and we have analyses from those.

Q. The five wells you sampled, they're identified on the spreadsheet in the C-108?

A. That is correct.

Q. Now, based on Energen's investigation of the geologic and engineering data, have you seen any evidence of open faults or other hydrologic connection between the disposal -- rather, the injection interval in any sort of underground drinking water?

A. No.

Q. Okay. Does the C-108 reference the water wells you sampled -- the chemical analysis also supporting your spreadsheet of those wells you sampled?

A. That is correct.

Q. Let's talk about the notice that was provided by way of the C-108. Did you notify the surface owner?

A. Yes.

Q. And that's reflected on Page 5 of the C-108; is that correct?

A. That's correct.

Q. And Dan Field is the surface owner. Okay. Did Energen receive any other objections to the project?

A. We received no objections.

Q. In your opinion, will injection operations pose any threat of impairment of correlative rights or waste of hydrocarbon reserves?

A. No.

Q. And in your opinion, can the project be operated so that public health and safety and the environment will be protected?

A. Yes.

Q. Now, were Exhibits 5 through 8 prepared by you or at your direction?

A. That is correct, they were.

Q. All right.

MR. HALL: At this point, we would move the admission of Exhibits 5, 6, 7, and 8, Mr. Examiner. And that concludes our direct of this witness.

HEARING EXAMINER: Exhibits 5 through 8 will be admitted. Questions, David?

MR. BROOKS: I have no questions.

HEARING EXAMINER: Mr. Bondurant, let's go back. I'm looking at the well sketch for the 8-R.

THE WITNESS: Yes, sir.

HEARING EXAMINER: I believe you said that that

intermediate string -- which is 8 and 5/8ths?

THE WITNESS: Yes, sir.

HEARING EXAMINER: Was cemented and circulated back to surface?

THE WITNESS: Yes, sir.

HEARING EXAMINER: When I look at that, that looks to me like the top of the cement there, is it 1,950?

THE WITNESS: Let me check my notes on here. You are correct. I'm sorry.

HEARING EXAMINER: So it was not --

THE WITNESS: That's right, it was cemented back to 1,950, that is correct.

HEARING EXAMINER: And the tubing size is what size?

THE WITNESS: I'm going to say 2 and 3/8ths.

HEARING EXAMINER: I jotted down 2 and 7/8ths, but --

THE WITNESS: 2 and 7/8ths. I've actually got the details on it right here if I can put my fingers on it.

HEARING EXAMINER: It's probably here in the C-108. And then I was a little confused looking at the log, your perfs are marked on there now from 11,520 to 11,592?

THE WITNESS: Yes. It was actually 11,520 to

11,540, then 11,546 to 11,592 is what was actually -- this -- that was the -- To back up just a little bit. A number of these wells, when they were originally perforated, they were perforated in the various sweetest part of the well, and that would have been the ones we've shown here.

And then we came back through later in the process of adding perfs in the very top to make sure that we got all the available oil that was in there.

So that's why a number of these wells have two sets of perfs, one over the meat of the well, and they're listed right on the top. The porosity is not nearly as well developed, but we didn't want to leave anything behind.

HEARING EXAMINER: Okay. And then the top of the Strawn you're calling at 11,500?

THE WITNESS: The top of the Strawn marker is at 11,500, yes, sir.

HEARING EXAMINER: And the base is --

THE WITNESS: Well, the base of the porosity is at 11,592.

HEARING EXAMINER: What would you call the base of the Strawn?

THE WITNESS: The base of the Strawn is actually well below there. 11,800, I believe. We don't normally

worry about the base of it because -- I would say -- hang on, I can tell you. 250 feet below the top of -- about 11,780, which would then be the top of the Atoka.

HEARING EXAMINER: Okay. No further questions. Thank you.

MR. HALL: Mr. Examiner, I offer Exhibit 9, which is our notice affidavit of the surface owner. And then the New Mexico State Land office was notified.

Exhibit 10 is our published affidavit and notice as well. And that's all we have.

HEARING EXAMINER: Okay. If that's all then, we'll take Case No. 14356 under advisement.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. _____ heard by me on _____.

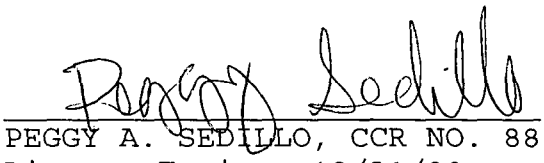
_____, Examiner
Oil Conservation Division

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

REPORTER'S CERTIFICATE

I, PEGGY A. SEDILLO, Certified Court Reporter of the firm Paul Baca Professional Court Reporters do hereby certify that the foregoing transcript is a complete and accurate record of said proceedings as the same were recorded by me or under my supervision.

Dated at Albuquerque, New Mexico this 10th day of September, 2009.



PEGGY A. SEDILLO, CCR NO. 88
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