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:

APPLICATION OF ENSTOR GRAMA RIDGE STORAGE AND TRANSPORTATION, LLC, FOR THE ESTABLISHMENT OF PRESSURE LIMITATION FOR INJECTION WELLS IN THE GRAMA RIDGE STORAGE AREA, LEA COUNTY, NEW MEXICO

CASE NO. 14518

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: WILLIAM V. JONES, Technical Examiner
MARK E. FESMIRE, Legal Examiner

July 22, 2010

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, WILLIAM V. JONES, Technical Examiner, and MARK E. FESMIRE, Legal Examiner, on Thursday, July 22, 2010, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South St. Francis Drive, Room 102, Santa Fe, New Mexico.

REPORTED BY: Jacqueline R. Lujan, CCR #91
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A P P E A R A N C E S

FOR THE APPLICANT:

WILLIAM F. CARR, ESQ.
HOLLAND & HART, LLP
110 North Guadalupe, Suite 1
Santa Fe, New Mexico 87501
(505)988-4421

Also present:

Tom Barron

EXAMINER JONES: Okay. Let's call Case Number 14518, application of Enstor Grama Ridge Storage and Transportation, LLC, for the establishment of pressure limititations for injection wells in the Grama Ridge Storage Area, in Lea County, New Mexico. Call for appearances.

MR. CARR: May it please the Examiner? My name is William F. Carr, with the Santa Fe office of Holland & Hart, LLP. We represent Enstor Grama Ridge Storage and Transportation, LLC, in this matter, and I have three, perhaps four, witnesses.

EXAMINER JONES: Any other appearances? Will the witnesses all please stand and state your names? And will the court reporter please swear the witnesses?

MR. GEE: Darryl Gee, G-e-e.

MS. DEVINE: Vicki Devine, D-e-v-i-n-e.

MR. BARRON: Tom Barron, B-a-r-r-o-n.

MR. WELLS: John Wells.

(Four witnesses were sworn.)

MR. CARR: May it please the Examiner? I need to make an opening statement in this case. We are actually here for the second part of a matter that was presented to the Division on July 23rd, 2009. And we presented the first part of the case to Examiners Warnell and Ezeanyim. With your permission, I'd like to provide

some background, so that I can -- I'm going to try and put in context what we plan to present here this morning.

We're talking about the Grama Ridge Morrow Storage Unit. It was approved initially in 1973, and it operates under what is really an unusual regulatory scheme. Here we have one gas storage project, but it's operated pursuant to two separate regulatory plans.

The first exhibit in our packet is a plat. If you would look at this, this is actually the area of review map from the case we presented a year ago. And, basically, what it shows is that we have a six-section storage project located in Lea County, New Mexico. Three of those sections, Sections 33, 34, and 3, are state and fee lands. And they are operated as part of a storage project pursuant to the unit agreement for the operation of the Grama Ridge Morrow Unit area. So those three sections are operated pursuant to a unit agreement.

All of these, you need to keep in mind, were approved prior to the C-108 process that we are familiar with today. And when the case was originally presented back in 1973 to the Division, the witnesses advised at that time that they intended to go forward with the project, and they intended to only report changes and things like injection pressure to the land office. And the OCD approved it, and that's what the prior operators

actually did. And that was the scheme that applied to the state and fee portion of the unit.

Then we had Section 4, a federal tract, that it became clear was not in the unit but in communication with the unit. So the operator at that time, Llano, went to the BLM to propose expanding the unit to take that tract, that section, in, that the BLM determined they did not want to be part of a three-way agreement between the operator, the State and the BLM. So they entered a separate agreement.

That agreement is called "the agreement for the subsurface storage of gas, Morrow Formation, Grama Ridge Area, Lea County, New Mexico." So that's the federal storage agreement. That agreement and the unit agreement cross-reference each other, and the provisions are compatible. But what we have is a six-section storage project, three of them operated pursuant to a unit agreement, and now three of those sections operated under this agreement with the federal government. The federal sections are Sections 4, 9, and 10.

And keep in mind, again, with the exception of Section 9, which was the case we brought last year, in which Section 4 was added and an injection well was approved, and a 5,000 pound surface injection pressure was approved. All of this occurred back before April

15th of 1981, and prior to the current C-108 process.

In 2005, Enstor acquired the Grama Ridge and became operator of this storage project. And since that time, they have undertaken a major effort to bring this project into line with current regulations at a state and federal level. And they have taken what was an outdated and really difficult to administer administrative scheme, and they have brought it into line with current regulations. They have, in essence, as Mr. Fesmire described it at one point, been trying to re-boot this unit to bring it in line with current rules and regulations.

Last year, as Enstor looked at adding an additional injection well, they became concerned about the nature of the prior approvals. They also were faced with a situation where they needed to quickly go forward and add Section 4 because of commitments with other operators. So we met with you, Mr. Fesmire, and Ms. Altomare.

At that time, we were seeking authorization to add Section 9 to the Grama Ridge Unit, this federal section. What we were seeking was the authority to inject at 5,000 pounds in that well. The BLM brought the federal tract in, and there are also some special rules that we wanted also to apply to our activities in Section

9.

At that meeting the OCD agreed that we could go to hearing in 2009 on the well in Section 9, and you agreed that we could continue to operate the other wells and inject at those current pressures. We agreed at our meeting that, after we obtained approval for the well in Section 9, we would come back and provide C-108 coverage under current rules for the other wells and seek your approval of the 5,000 pound surface injection pressure for all of these wells.

In 2009, the BLM expanded the unit, and we were able to negotiate with them a restated unit agreement. We have been able to go to the Land Office, and we have modernized all our agreements with the State Land Office.

And last year, the Oil Conservation Division entered Order Number R-13174. They approved the injection in the well in Section 9. They approved the 5,000 pound surface injection pressure for that well and expanded all rules that applied to the storage project to Section 9. Order 13174 was entered in Case 14332, and I would ask that you incorporate the record of that case into this proceeding, because this really is an extension of what was presented there. And all relevant unit documents that go back over the years were admitted into

the record in that case.

You will also find, Mr. Jones, Order R-13174, correctly, and in some detail, summarizes the history of the unit and clarifies what I have just addressed here today. But I think it's also important, as we start this case, to remember that the evidence is going to show that the project was approved, it was approved under rules that were in place at that time, and it has been a project going forward now for 35 years.

They haven't been operating without keeping the OCD in the loop. They have come periodically to the OCD with various matters. This order, in fact, will be the 21st order since 1973, that in one way or another, involves issues that relate to the Grama Ridge storage project. And I hate to report to you that I participated in the 1973 hearing, and I've been involved in every case that resulted in each of these orders since that time

EXAMINER JONES: We're lucky to have you here.

MR. CARR: I am not so sure I'm lucky to be here. But it's important to know that this has not been something that's been done outside of a relationship with the OCD. Not only have there been all of these hearings, but all the injection pressures and all the volumes and everything they're required to report, they

have been reporting to you.

So today, this will be what we hope will be the final step in an effort to bring this project in line with every regulatory requirement, state and federal. And we're asking you to re-approve for the injection wells so we can continue to inject at the 5,000 p.s.i. surface injection pressure. And we are also going to request that you authorize us to add additional wells to the project through an administrative procedure without coming back to hearing.

Today we're going to initially call three witnesses. Darryl Gee, the director of regulatory matters for Enstor, will give you a brief history of the project and confirm that we have given appropriate notice of today's hearing.

Vicki Devine, our geologist who has assisted in the preparation of the C-108 applications, is going to review her study of the geology, in particular, the Morrow Formation in the area surrounding this project. And John Wells, our engineering witness, is going to present the C-108 applications and address the pressure issue. We also have Thomas F. Barrons with us. He's a drilling engineer, in case you have questions that fall within his area of expertise.

With that, I would like to call Darryl Gee.

EXAMINER JONES: For the record, we'll incorporate the record of Case 14332 into this case.

DARRYL GEE

Having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record, please?

A. Yes. It is Darryl Wayne Gee.

Q. Where do you reside?

A. Houston, Texas.

Q. By whom are you employed?

A. Enstor Operating Company, LLC, in Houston, Texas.

Q. What is your current position with Enstor?

A. I am director of regulatory affairs and land management for Enstor.

Q. Could you explain to Mr. Jones who Enstor is?

A. Enstor is a company that owns and operates gas storage facilities throughout the United States. It is a subsidiary of Iberdrola Renewables. Iberdrola Renewables is, of course, one of the largest wind developers in the nation. And, of course, both companies are owned by Iberdrola, a Spanish utility company.

Q. Are you registered to do business in the State

of New Mexico?

A. Enstor Grama Ridge Storage and Transportation, LLC, is registered to do business in New Mexico.

Q. And you have owned and operated the Grama Ridge Storage Unit since 2005?

A. Yes.

Q. Have you previously testified before the Oil Conservation Division and had your credentials as an expert in land matters accepted and made a matter of record?

A. Yes. That was a year ago tomorrow.

Q. And you were our land witness at that time?

A. That's correct.

Q. Have you ever testified before Mr. Jones?

A. No, I have not.

Q. Could you review for the Examiner your educational background and work experience?

A. Sure. In 1985, I received a bachelor of applied arts and sciences degree with a double major in petroleum technology and petroleum land management, and post-graduate studies in business administration. In 1987, I began my career as a self-employed landman.

I ended up having and owning my own brokerage firm in Houston, Texas, for a number of years, until 1991, when I left the brokerage firm. Then I started and

began work as a land manager for Western Gas Resources there in Houston, Texas.

From that point, until 2001 -- or 1999 -- excuse me -- I was with Aquila Energy in Houston. And then in 2002, I left Aquila and became an employee of Enstor Operating Company in Houston.

Q. Are you familiar with the application filed in this case on behalf of Enstor Grama Ridge?

A. Yes.

Q. Are you familiar with Enstor's operation of the Grama Ridge storage project area?

A. Very much so.

Q. Are you familiar with the status of the lands in the area that are the subject of today's application?

A. I am.

MR. CARR: May it please the Examiner? We tender Mr. Gee as an expert landman.

EXAMINER JONES: Mr. Gee is qualified as an expert in land matters.

1987 was a tough year.

THE WITNESS: Yes, it was.

EXAMINER JONES: You hit the ground running and survived in a tough time.

THE WITNESS: By the skin of my teeth.

EXAMINER JONES: I think I remember Aquila

from the '90s. I understand the storage business is very much in demand right now.

THE WITNESS: It has been. And, hopefully, it will continue to be.

Q. (By Mr. Carr) Could you please briefly summarize what it is Enstor seeks with this application?

A. Yes. Enstor seeks authorization approving for a surface injection pressure limit of 5,000 p.s.i.g. at the existing Grama Ridge storage injection wells.

Q. These are previously approved injection wells?

A. That's correct.

Q. So what we're really doing is seeking a re-approval at the 5,000 pound injection pressure?

A. That's correct.

Q. And I think what we ought to do at this time, if you could, why don't you take out Exhibit Number 1 and review the information on this exhibit for the Examiner?

A. Exhibit Number 1 is a land plat depicting the six-section Grama Ridge Morrow storage unit in Lea County, New Mexico. It's comprised of Sections 34, 33, Section 4, Section 3, Section 9, and Section 10.

Q. Can you point out the wells that are the subject of today's hearing?

A. Sure. You will have four wells. You'll have one in Section 33. It's about in the middle of that

particular section. The other is in Section Number 34. That's going to be in the southwest quarter section of 34.

Q. That's your Number 2 well?

A. That's correct. And right in the dead heart of Section 4 is another one of our wells.

Q. The Number 4 well?

A. That's correct. And the Number 3 is in Section 3.

Q. That's in the northwest quarter of 3?

A. Correct.

Q. The well in Section 33, the Number 3 well, are you going to use that well for injection?

A. We propose to use that well for a monitor well, to monitor pressures in the reservoir.

Q. But to be sure we have touched every regulatory stone, you've also included a C-108 application for that well?

A. Correct.

Q. If we go down to Section 9, in the northeast quarter of Section 9, there's also an injection well. Was that approved a year ago?

A. Yes.

Q. That's the well we were dealing with BTA trying to acquire?

A. Right. It's the Grama Ridge Federal 8817 JVP Number 1 well.

Q. Those are all the wells that we're operating in this storage unit?

A. Correct.

Q. Is Enstor also seeking a procedure whereby you could add additional injection wells to this unit area through an administrative process without coming to hearing?

A. That's correct. Yes.

Q. If we look at the map, the federal lands are which of these sections?

A. Federal lands are going to be Section 4, 9, and 10.

Q. And the remainder of those are state fee lands?

A. State and fee lands, yes.

Q. Let's go to Exhibit 2. Would you identify that for the Examiner, please, and very briefly summarize what this shows?

A. Exhibit Number 2 is the long and storied history of the Grama Ridge storage facility and its regulatory proceedings that have taken place since the beginning of time. I believe, again, 1973 was the first proceeding.

Q. Basically, this shows the approval of the original unit and the addition of the various sections to get to the current size of the unit?

A. That's correct.

Q. And indicates when the injection wells were approved?

A. That's correct.

Q. Then the third page is similar information on the federal lands in the unit?

A. That's correct.

Q. All injection wells were approved at the state. This federal agreement just is the addition of the lands and the operation of those?

A. (Witness nods head.)

Q. And then we have a section at the end that relates to protection of the storage reservoir. These orders actually related to the case a year ago, did they not?

A. They did.

Q. At this point in time, all rules that protect the integrity of this unit by OCD order applied to all of the six sections in this particular storage project?

A. They do.

Q. And attached to this are certain OCD orders?

A. Yes.

Q. We have included only the OCD orders this year, although all other agreements were included in the record a year ago?

A. That's correct.

Q. Were you involved in last year's expansion of the unit to include Section 9?

A. Yes, I was.

Q. And what were you able to negotiate with the Bureau of Land Management?

A. We successfully negotiated an amended and restated agreement with the BLM to include Section 9.

Q. And it's a current, modernized agreement that governs all the federal lands of this acreage?

A. It does.

Q. Last year you were able to obtain OCD approval for injection in the Number 9 well?

A. That's correct. We did.

Q. It was at that time that we agreed to return and provide C-108s for the other wells in the area to bring this project in line with current OCD regulations?

A. That's correct.

Q. Has notice of this application been provided in accordance with the rules of the OCD?

A. It has.

Q. And to whom has notice been provided?

A. We have provided notice to all interest owners within a mile of each one of the current injection withdrawal wells that was parcipitated out of a discussion with the OCD as far as guidance as far as the notice.

Q. We met with Mr. Brooks to confirm the parties with whom notice should be provided, and we enlarged the notice area so we would pick up all offsets?

A. Yes.

Q. And those are the notice letters that have been provided?

A. Yes.

Q. Is Exhibit 3 an affidavit confirming that notice of today's hearing has been provided?

A. Yes.

Q. Have you had discussions or contacts from any interest owner in response to this notice?

A. Only one, and that would be with the Bureau of Land Management. And what happened then is that they had some initial questions, and I answered those questions to their satisfaction, and all have been resolved.

Q. And who did you visit with at the BLM? Mr. Ingram?

A. Wesley Ingram.

Q. Will Enstor call technical witnesses to review

the geological and engineering portions of the application?

A. Yes, we will.

Q. Were Exhibits 1 through 3 either prepared by you or had you reviewed them and can you testify as to their accuracy?

A. Yes.

Q. That concludes my examination of Mr. Gee, and I would move the admission of Enstor Exhibits 1 through 3.

EXAMINER JONES: Exhibits 1, 2 and 3 will be admitted.

(Exhibits 1, 2 and 3 were admitted.)

EXAMINATION

BY EXAMINER JONES:

Q. So you dealt with the Carlsbad office of the BLM?

A. Yes.

Q. And the well in Number 10, which well is that?

A. We do not have an injection withdrawal well in Section 10.

Q. Okay. But do you plan on putting a well there?

A. At some point in time in the future, we may.

Q. You wanted an administrative procedure to do

it --

MR. CARR: So we could simply file the C-108. And when we satsify you in that regard, we could expand the unit without coming back for a full hearing.

EXAMINER JONES: The notice that was provided, did it cover the bases that that well might be added in the future? In other words, it was a notice in perpetuity?

MR. CARR: The notice that was provided was to the owner of the surface of the land and each owner within a half mile. And then we expanded that to go to a mile, because that enabled us to pick up every interest owner in the unit.

And if we filed a new C-108 application, we would, again, have to provide notice at that time. So this would not mean that there would be no additional notice. It means we would just be within the four corners of the C-108 application as it applied to that one individual well.

EXAMINER JONES: Okay. I think I might be asking for a draft order of this case --

MR. CARR: We can do that.

EXAMINER JONES: -- just to make sure I don't mess it up.

MR. CARR: That means I get to mess it up.

EXAMINER JONES: That way I can blame him. No, I wouldn't do that. Okay.

Q. (By Examiner Jones) So that was the meeting with the feds. What about the state and fee people? Was there any -- as far as what we're trying to do today, did you meet with them for any reason?

A. Previously we had met in 2006 with the state and entered into a new agreement, and you'll see this in the record of the previous case that was had last year, a new agreement with the state that allows us to do -- have full use and enjoyment of the state-owned lands for use of natural gas storage. So we already have all of that in the process and it's done. We have not had any calls or concerns from any of the smaller fee interest owners.

But everything else has been resolved with the state and with the BLM, so no contest.

Q. So they're in agreement as to the depths of the storage?

A. Yes.

Q. In the Morrow -- it will be in the Morrow. I'm sure we'll talk about that.

A. These wells are existing wells that have been drilled and completed and used for injection of natural gas for years. And so we're not changing the interval. All we are doing is for cleaning up the record, if you

will, the procedural record, because the project itself predated the C-108 process.

EXAMINER JONES: Yes. And even the C-108 is a little old itself. The actual rules -- C-108 has been there a long time, but the actual rules according to notice is stated a little more clearly, I would say, in the rules now as to what they say in the form, C-108 form.

MR. CARR: Also, you need to know that when we started back in '73, this was simply a voluntary unit agreement, and that was approved by the Commissioner.

As we moved through time, questions really came up whether or not this was a producing unit that would hold the acreage, or was it more accurate to describe what had been granted by the state as actually being more in the nature of an easement. Yet you couldn't just go to the easement side of the question, because there might be some residual gas or some enrichment.

So it was a very detailed negotiation with the Land Office to come forward with a new unit agreement that they recognize is also in the nature of an easement. But we put that all together soon after Enstor took over, and we got the Land Office part of it together.

We actually assumed that we were all right, because it looked like they had proper OCD approval. It was only when the well was being added in 9 that we started going through and we didn't have the full C-108 review or the pressure approvals. We had the initial pressure with a statement that we're going to increase it, and we had reported it. But we're just trying to finish an effort to be sure we correct every regulatory stone on this project.

EXAMINER JONES: Pressure is pretty important on a storage project.

Q. (By Examiner Jones) The requirements that still exist for reporting to the state is that -- do they still want you to report the pressures all the time to them?

A. We do. We stay in constant contact, of course, with the OCD as far as our monthly 131 submittals. But with the State Land Office, it's not necessary that we report the pressures, but we report volumes to them, and we compensate them based on volumes.

So we're constantly in communication with the State Land Office and the Bureau of Land Management and the small fee interests that we have. So we're always communicating with those three.

Q. So the volumes, you're talking about the

volume of the reservoir or the volume that you put in and withdraw?

A. Injection withdrawal.

Q. The volume of the actual reservoir, has it been estimated and considered to be -- has it been reported to the state? The State Land Office is the same as the feds; is that correct? Or is that not pertinent to this?

A. It will and it has been. And, again, I believe you and I had a discussion a couple of weeks ago, maybe a month ago, about volumetrics and what the federal government has as far as what we've reported to the federal government and what we should report to the OCD as far as the new expansion capacity with the addition of Section 9. And we are reporting that now, since we have commenced injection into that new well in Section 9.

Q. This easement thing, I'm sure is -- maybe it's cutting edge legal. I don't know. But something to do -- maybe it's similar to the CF2 sequestration that might happen sometime on other --

MR. CARR: I don't know if it's cutting edge or safety net, because the unit is held by production. And if --

EXAMINER JONES: It's a voluntary unit.

MR. CARR: And if there really is

production after 35 years of injection and withdrawal and prepayments for any residue gas years and years ago that might have been in the reservoir, you don't want the thing to terminate. So if you structure it as also in the nature of an easement, I think you protected the unit, and I think that's what this was about. It protected the project.

EXAMINER JONES: Okay. For example, I get questions sometimes on the Rhodes gas storage project, and that's being blown down; is that correct?

MR. CARR: I don't know.

EXAMINER JONES: This is what the legal guys do. They're very careful about what they say. But if it's being produced, would that go back to a lease status?

MR. CARR: It could.

EXAMINER JONES: That would be some day in the future?

THE WITNESS: Well, here in Grama Ridge, all we are looking at doing is to continue to own and operate this facility and put it in 21st century regulatory regime, if you will, and with the potential for additional expansion.

With the addition of Section 9, we have been very pleased with some of the initial results with the

addition of the new well. We are looking at the possibility of drilling additional wells. Of course, the process there would involve having to go to both the BLM, if it is on federal land, and also to the OCD for the drilling of permits. And then if we inject or seek to use the well for injection withdrawal, a C-108 will -- we'll go through that process.

Q. (By Examiner Jones) But that's not -- this request to administratively expand, are you talking in terms of additional perforations in existing wells, or are you talking about the additional wells within these six sections, or are you talking about expanding the six sections?

A. No. We would only be talking about drilling of new wells within the confines of the six sections being the storage unit area. And it would not be for going into the existing wells to perforate other intervals that have not already been perforated, per se. But it would be for new wells within the six sections of the storage area.

Q. Okay. And it's fixed as far as the top and bottom of the storage?

A. (Witness nods head.)

EXAMINER JONES: Okay. I better stop. I don't have any more questions.

MR. CARR: I have no further questions of this witness. We would call Vicki Devine.

VICKI DEVINE

Having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record, please?

A. Vicki V. Devine.

Q. Ms. Devine, where do you reside?

A. Denver, Colorado.

Q. By whom are you employed?

A. I'm self-employed.

Q. What is your relationship with Enstor?

A. I'm the consulting geologist on the Grama Ridge project.

Q. Have you previously testified before the Oil Conservation Division?

A. I have, last year at that time.

Q. You have not testified before Mr. Jones?

A. I don't think so.

Q. Would you review for the Examiner your educational background and your work experience?

A. Certainly. I received a bachelor of science degree in geology from the University of Georgia, then a

master's degree in geology from the University of Texas, then an MBA in finance from the University of Colorado in Denver.

I started work in 1980 as an exploration geologist with Tenneco Exploration and Production in Denver. I stayed there six years, until 1986, when I left as a senior geologist and began consulting.

Since that time, so for 24 years, I've been consulting mostly in the Rockies. I worked most of the basins in the Rockies. I have worked the Permian Basin in Texas, the Delaware Basin in Texas and New Mexico, some Coastal Louisiana and Southeastern Kansas in the Cherokee Basin.

EXAMINER JONES: Southeastern Kansas has Morrow sand, also?

THE WITNESS: Um-hum.

EXAMINER JONES: Or at least Southeastern Colorado does.

THE WITNESS: Definitely. Yes

EXAMINER JONES: Tenneco, I'm not sure anybody knows who owns some of the old Tenneco properties.

THE WITNESS: They don't anymore, I can tell you that. They sold the properties and the people.

EXAMINER JONES: By state?

THE WITNESS: Right. Or by basin, actually.

EXAMINER JONES: By basin?

THE WITNESS: Um-hum. They did.

Q. (By Mr. Carr) Ms. Devine, are you familiar with the application filed in this case?

A. I am.

Q. Have you made a geological study of the area that is the study of this application?

A. I have.

Q. Are you prepared to share the results of your work with Mr. Jones?

A. I'd be happy to.

MR. CARR: We tender Ms. Devine as an expert witness in petroleum geology.

EXAMINER JONES: Ms. Devine is a qualified expert in petroleum geology.

Q. (By Mr. Carr) Have you prepared exhibits for presentation here today?

A. I have.

Q. Are they included in each of the C-108 applications that have been filed in this case?

A. They are.

Q. Have you also prepared a cross-section that is not in the C-108?

A. Right. That's Exhibit 10, I believe.

MR. CARR: May it please the Examiner, with both of our technical witnesses, we're going to look at one C-108. There are four of them. Other than just the depths and the wellbore diagrammatic sketches and the data sheets and areas of review maps, they're virtually the same, and the questions and issues are identical.

So with Ms. Devine and also with our engineering witnesses, we're going to review one. If you have any unique questions or concerns about any individual well, we're prepared to respond to them. But it would be very redundant to just march through all four, because they're very similar.

EXAMINER JONES: Thank you.

Q. (By Mr. Carr) Ms. Devine, could you describe the nature of the Morrow formation in this area?

A. Sure. I'll be referring to the structure map. I believe it's on page 11 of Exhibits -- is it 5 through 8 or 4 through 7?

Q. I need to tell you that I can't count to four, so it's 5 through 8. There is no Exhibit 4. It's my mistake.

A. Okay -- and to the stratigraphic cross-section, which is Exhibit 10.

Q. Let's go to the first C-108. That's Exhibit

Number 5.

A. Right.

Q. And first just generally describe the nature of the Morrow formation.

A. The Pennsylvania Morrow formation in this area of the Delaware Basin consists of two intervals. The lower interval is the Morrow Clastics, which is a series of interbedded sandstones and shales. It's overlayed by the Morrow lime or limestone, which consists of limestones and carbonate shales.

The gas in the Grama Ridge Unit is stored in the lower Clastics interval, not in the limestone.

If you'll look at the cross-section now, which is Exhibit 10, I'll summarize the stratigraphy and the lithology of the Morrow in the Grama Ridge.

MR. CARR: It's the very last exhibit in our package, Exhibit 10.

THE WITNESS: It should be the only cross-section in there.

EXAMINER JONES: And each C-108, where --

MR. CARR: In each packet of exhbits behind the C-108 is a cross-section, and there's one cross-section.

THE WITNESS: It's the same cross-section. I put all four wells on there.

EXAMINER JONES: Thank you.

Q. (By Mr. Carr) Does the cross-section have each of the four wells that are the subject of today's hearing?

A. It does. They're labeled at the top, the Grama Ridge Morrow Unit 1, 2, 3, and 4.

Q. And the C-108 for the Number 1 well is Exhibit 5, and that's what we're looking at?

A. Correct.

Q. Let's go.

A. The cross-section is hung on the top of the Morrow Clastics, which is the black line. That's the horizontal line. The storage unit for New Mexico is indicated in red on the left side of the gamma ray, so it goes from the top of the Clastics interval through the Morrow D.

The unit itself is divided into four intervals, the A, B, C, and D. Those are colored in blue, green, red and orange. Those tops are marked on the cross-section. The wells -- I mean the logs that are on the cross-section, the left-most wells, is a normalized gamma ray. The second track in the middle is the sonic porosity, and the right-most track is the resistivity log.

You can see that on the cross-section the

sandstones are variable within the unit. They occur in all three zones, depending on the well. The Number 3 well, which is the second well from the left, is the only one that has sandstone in all three intervals, A, B, C and D. We'll be injecting into the A, B and C, not the D. The D in this area is shaley in type and was nonproductive.

You can see when you look at the sands that do exist, that they vary in thickness and they vary in extent. And they also, within each stratigraphic unit, they also vary in the stratigraphic position.

In general, the sandstones at Grama Ridge were deposited during base level rise in valleys that were cut into the marine Morrow shales during the previous regressive phases. So the sea came in and filled in the previous valleys. The flooding resulted in the deposition of dip-oriented channel-filled sandstones, along with strike-oriented deltaics, estuarine and marginal marine sandstones.

Then you had erosion on top of that, so some of the sands were taken away. The result of the differing deposition and preservation in these multiple environments resulted in discreet sandstones that are about 10 to 30 feet thick. Where they're present, they're discontinuous and generally less than one mile

wide. They vary widely in porosity and permeability, and they're interbedded vertically and laterally with tight shales.

If you'll now look at the structure map on page 11.

Q. Okay. Would you review that?

A. Certainly. This structure map is contoured on top of the Morrow A, which is the blue marker on your cross-section. Similar maps on the B and C units look very close to this, obviously, just a little bit deeper and lower in elevation.

The reservoir is located on a structural nose, a very strong structural nose, which plunges from northeast to southwest. It's bounded on the west by a normal fault, which is down thrown between 500 and 800 feet. The reservoir is bounded on the south and east by a gas water contact.

In this case this is contoured on the top of the Morrow A. The gas water contact is, I believe, minus 9,250. There should be a dash line on there which shows that. And it's also bounded to the north by a pinchout of the reservoir quality sands, so it's bounded all the way around.

Q. What conclusions can you reach from your study of the reservoir?

A. This Morrow reservoir does have sufficient porosity and permeability to inject and withdraw natural gas. And because of the bounding fault and the structural position and the nature of the gas -- I mean of the sands themselves, we have geologic containment in the storage reservoir.

Q. We've been looking at the C-108 application for the Number 1 well?

A. Correct.

Q. Would the same testimony and conclusions apply to each of the four wells that are the subject of the case?

A. Yes, sir, each one of them.

Q. Was the structure map and the geological summary contained in each of the C-108s and the cross-section that you have reviewed, were they all prepared by you?

A. Yes.

MR. CARR: At this time we move the admission of the geological summary and structure map. Those are pages 9 through 11 of each C-108, and the cross-section, which is our Exhibit 10. We move the admission of those exhibits.

EXAMINER JONES: Okay. Pages 9 to 11 of each C-108 and the cross-section -- and did I miss

something?

MR. CARR: Exhibit 10.

EXAMINER JONES: -- are admitted.

(Summary, Structure map, and Exhibit 10 were admitted.)

MR. CARR: That concludes my direct examination of Ms. Devine.

EXAMINATION

BY EXAMINER JONES:

Q. Okay. Well, why wasn't Section 9 added years ago?

A. I don't know. I would have wanted it in there.

Q. Okay. So did you see any old maps that didn't look like this?

A. I didn't see any old maps at all. I started from scratch.

Q. Was that well -- how old is that well?

A. You know, I don't know.

Q. What I mean is, was it a producing well in the Morrow, and did it affect the storage unit? Of course, we're not here to talk about that anyway, so I better -- let's just go on.

MR. CARR: Because we don't know.

A. I can find out. I have it on my database. I'd have to boot up my computer.

Q. That's fine. According to this map, it looks like the only -- of course, it depends on, obviously, the -- measuring the pressures, you know, offset this versus on the storage field. But in Section 34, it looks like that's the only one that you have to be kind of careful about; is that correct? As far as maybe influencing off of the storage. You've got good bounding here, except like up to the northeast.

A. Yeah. The sands pinch out.

Q. Oh, they pinch? Okay.

A. Yes.

Q. Because this is a top structure map?

A. Right. It's not a sand map.

Q. Okay. Well, it looks like the wells that were produced are being used for -- and nobody is punching any more holes out there?

A. No.

Q. In the Atoka -- maybe not there, or nobody -- you guys control the rights to it or whatever.

Anyway, as far as the pressure goes, geologically speaking, the reservoir looks pretty good to you?

A. It looks good, and it's contained.

EXAMINER JONES: Okay. I better stop there. I don't have anything further.

MR. CARR: That concludes our questions to Ms. Devine. At this time I would call John Wells.

JOHN WELLS

Having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record, please?

A. John Alan Wells.

Q. Mr. Wells, where do you reside?

A. In Sugar Land, Texas.

Q. By whom are you employed?

A. Wells, Chappell & Company, Incorporated.

Q. What is your relationship with Enstor?

A. I am consulting reservoir engineer on the gas project.

Q. Have you previously testified before the OCD?

A. Yes.

Q. In fact, you testified as our engineering witness a year ago?

A. That's right.

Q. Have you ever testified before Mr. Jones?

A. I don't believe.

Q. Could you review your educational background and work experience?

A. In 1971, I earned a bachelor of science degree in mathematics and chemistry, Delta State University, Cleveland, Mississippi. In 1973, I earned a master of science in physics, Mississippi State University, Starkville, Mississippi.

Employment, 1974, I went to work as a research scientist with Texaco in the Bellaire Laboratory in Bellaire, Texas. In 1978, I went to work for Intercomp Resource and Development Worldwide Consultants. And in 1984 a group of the Intercomp guys and myself formed our own company, which today has evolved into Wells, Chappell & Company, Sugar Land, Texas, providing all aspects of reservoir engineering and with specialty on gas storage and numerical simulation.

Q. Are you familiar with the application filed today in this case?

A. I am.

Q. Are you familiar with Enstor's operation in the Grama Ridge storage project?

A. I am.

Q. Have you conducted an engineering study of the area that's the subject of this case?

A. I have.

Q. Did you actually prepare the C-102 application in this case?

A. I did not actually prepare it, but I reviewed it in some detail.

MR. CARR: We tender Mr. Wells as an expert witness in reservoir engineering.

EXAMINER JONES: Mr. Wells is qualified as an expert in reservoir engineering.

Q. (By Mr. Carr) Initially, I'd like to just identify the exhibits we're going to present today. Are Enstor Exhibits 5 through 8 the C-108 applications for each of the wells that are the subject of today's hearing?

A. That's correct.

Q. Then you have also prepared a plot that you're going to review that will address the issues concerning pressure?

A. That's right.

Q. As to each of the C-108 applications, do they contain similar information?

A. They do, similar characteristics.

Q. There would be only obvious variations as to things like the perforated interval of the area?

A. That's right.

Q. Do the applications contain all applications required by the Form C-108?

A. Yes. To my knowledge, it does.

Q. Is this an expansion of an existing project?

A. No. It's a re-permit.

Q. If we go to -- I think we should work from Exhibit 5, which is the C-108 on the Number 1 well. If we go to page 5 in that exhibit, could you identify that, please?

A. Yes. Page 5 is an orientation map, essentially orienting the location of the injection well or wells, the lease ownership in the area. It's a depiction of all the wells within the two-mile radius, as required by the C-108. And it shows the area of review of the one-half mile radius and all the wells that penetrate the Morrow within that half mile radius, shows all the other wells in the area and identifies the offset operators.

Q. Exhibit Number 5 actually has got ownership information on it. And we have a similar map as Exhibit 6. We supplied two maps just because there's so much information.

A. That's correct.

Q. Are there wells within any of the areas of review that penetrate the injection zone?

A. None.

Q. And then I guess there are no plugged and abandoned wells in the area?

A. No, no plugged and abandoned wells.

Q. Let's go to pages 3 and 4, and I would ask you to just identify these, please. Are these the well data sheets and schematics for each of the wells?

A. That's right.

Q. Basically, what do they show?

A. The well data sheets just provide information on the type of materials used in the casing and the tubing, the packer materials, type of packer, you know, injection information, things like that.

Q. In fact, Enstor has put new tubing in all these wells recently?

A. They have.

Q. What kind of tubing did they use?

A. Carbon steel tubing.

Q. In each of these wells, is the annulus filled with an inert fluid and a pressure gauge attached to the surface?

A. It is. The annulus is filled with KCL inhibitor fluid.

Q. They're completed in a fashion that complies with the federal underground injection program?

A. Yes.

Q. How large an interval in the Morrow formation has Enstor perforated?

A. The perforations are run from approximately 12,826 feet to 13,025 feet. That's the unitized interval.

Q. And the actual perforations in each of the other wells are shown and the schematics included in each of those C-108s?

A. They are.

Q. Are there any other productive formations within a half mile of this reservoir?

A. No.

Q. What is the character of the gas that Enstor injects in the subject wells?

A. We just inject pipeline gas, gas that comes right off the pipeline and put it into storage for customers.

Q. Could you explain to Mr. Jones the daily injection rates that Enstor uses?

A. The daily injection rates that are utilized at the storage are a function of the current pressure and the desire of the customer to either put gas in or take gas out on a given date.

And over time, if you look at the operation, you'll see that a given well might inject as little as a few million a day and maybe as high as 30 million a day, 30 million cubic feet a day.

Q. It's possible in the future you could even go above that?

A. And in the future, you know, if we are authorized to go to the higher pressure, I think that certainly the greater injectivity rate would be sustained.

Q. But because this is a storage project, it's dependent on capacity of the reservoir, the pressure, and demands of the customer?

A. Right.

Q. Will these be open or closed systems?

A. This is a closed system.

Q. Will you inject under pressure?

A. Yes.

Q. And you are injecting under pressure?

A. Yes, we are.

Q. What is the pressure that you're seeking authorization for here today?

A. We're asking for 5,000 pounds flowing well head.

Q. Let's go to the plot that you prepared. I'd like you to identify this for Mr. Jones. Then let's review the information on this exhibit.

A. Okay. Well, this chart was put together in support of our request for the 5,000-pound pressure

permit, and I would suggest that there are two primary things to consider here. One, being that the 5,000-pound pressure request is still well below -- on the order of 1,600 pounds below the bottomhole discovery pressure at the Grama Ridge Unit.

Beyond that, this chart right here, is the actual historical material balance performance that has been observed over the last 35 years in the field operation. And what we see, the value of this chart is that it is an industry-standard methodology for looking at volumetric performance of any gas reservoir. And it's useful in detecting containment of gas or the lack thereof, and certainly that's something that is critical in gas storage.

But if you look at this chart, what you see is a linear and repeatable relationship between the pressure applied on the reservoir and the volume of gas stored within the pore space of the reservoir, and that linear relationship is indicative of gas containment.

So it's straightforward to take a reservoir like this, that's been operated predictably and repeatedly for 35 years -- and I would point out that that point up there, that's March 2009, that we've operated all the way to that point. That's where we currently operate.

Q. That's the highest pressure?

A. That's the high point. So all we're suggesting is to extrapolate -- it's not much of a jump to extrapolate to that next little increment, which would give us about two more BCF of storage capacity if we could get to this higher pressure operating level. That adds a lot of value to the project, itself, adding more capacity, and provides more space for the customers to use.

Q. If we look at this exhibit, we've got a maximum pressure target of 5,000 p.s.i.?

A. Um-hum.

Q. That's what we're seeking authorization for?

A. That's correct.

Q. If we move up that curve, we have another spot that shows that even at that level, we are significantly below the discovery point in the reservoir?

A. That's correct.

Q. When we look at this exhibit as a whole, we can see that it confirms the containment of the injected gas over a long period of time?

A. It confirms containment. And I would point out, also, that the linear relationship means that the operator can, with confidence, project at any pressure what his inventory will be. That's a key element of

operating gas storage.

Q. At 5,000 pounds, this is, in fact, a conservative pressure based on the information that we know about this particular reservoir, is it not?

A. I would say it's conservative with respect to the fact that most gas storage operations are carried out at least at normal -- at original discovery pressure. So even with the 5,000-pound permit request that's on the table, we would still be well below. Like I said, on the the order of 1,600 pounds per square inch below original discovery pressure.

So, yes, very conservative and safe, no reason to expect anything but continued containment of the gas and predictable operations.

Q. Is it your testimony that at the requested pressure, Enstor can safely inject and withdraw gas in this reservoir and be confident that the gas is being contained within the structure?

A. I see no reason that operations at this level would not be safe, and containment is certainly predicted by the material balance chart.

Q. In this area, the Morrow formation has been substantially depleted, has it not?

A. It has.

Q. There are no other producing zones that would

be impacted by this injection?

A. Nothing else going on in the area.

Q. Are there any fresh water zones in the area?

A. There are. There is the Ogallala Aquifer, which is encountered at a depth of about 50 feet or so. Typically, it is found at a depth of 100 to 500 feet. There's also the Capitan Aquifer encountered at 500 to 1,000 feet.

Q. Are there any fresh water wells within a mile of the proposed injection wells?

A. The only one that I know of is the water supply well that serves the Grama Ridge compression station. It's completed in the Ogallala and encountered water at about 62 feet.

Q. Is there a summary report of the analysis of the water samples from that well included in the C-108 applications?

A. Yes.

Q. Is that at page 12 of each of the applications?

A. Page 12.

Q. Have you examined the available geologic and engineering data and, as a result of that examination, have you found any evidence of open faults or other hydrologic connections between any of the injection zones

or any source of drinking water?

A. I have not.

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

A. Yes.

Q. Were Exhibits 5 through 9 either prepared by you, or have you reviewed them and can testify as to their accuracy?

A. Yes.

MR. CARR: May it please the Examiner? At this time I move the admission into evidence of Enstor Exhibits 5 through 9.

EXAMINER JONES: Exhibits 5 through 9 will be admitted.

(Exhibits 5 through 9 will be admitted.)

MR. CARR: That concludes my direct examination of Mr. Wells.

EXAMINATION

BY EXAMINER JONES:

Q. So your company, does it still run Intercomp, or is that an old name?

A. Did you know Intercomp?

Q. I went to a few schools on -- little two-week school?

A. You went to one of those schools? Beta 2, to learn how to run Beta 2 and all that kind of --

Q. Yeah.

A. I was an instructor there. I may not have been there when you came. But that was one of the things that Intercomp did as an additional revenue source, frankly, was to put on lots of training. At that time we were -- all of our software was being used mainly by the Saudis and Kuwaitis.

Q. It was state of the art.

A. So we had to make money in the states another way by training people, because it wasn't accepted readily here in the states.

Q. Do you still use a simulator with your -- is this field set up on a simulation?

A. Yes. In fact, we made tremendous advances since those days. Simulations these days are certainly all three-dimensional -- you know, anything that you want to put up on the screen and you can rotate it in three dimensions and look up under the reservoir. You can watch the pressure as a result of injecting gas. In a well, you can see the pressure transients propagate out away from the well in a color fashion and things like that. It's very commonplace to do simulation these days.

(Examiner Fesmire entered the hearing.)

Q. Okay. I just remember -- in fact, I probably don't remember even enough to ask you too many questions on simulation except there was a way that the steps went from one step to the next, was either --

A. Either fully implicit or explicit.

Q. I remember that.

A. That's amazing you still remember that after all that time, because that was a very fine point, not necessarily the major point trying to get across.

Q. Some people actually used it, I think. We're talking about Texaco's Intercomp. I think it was run on the main frame out of Bellaire that we could do it on the -- I guess they call it the cloud nowadays. In the old days it was a monitor, and you work through the -- I'm not sure if that's any difference in what we're doing now.

A. The old raised floors had all the air conditioning under them and all that. Remember? We've come a long way since those days.

Q. I bet. The visualization was something that I wish I could have seen more of. I know our geologists about 10 years ago were actually visualizing -- over in the Paradox Basin, they were visualizing the CF2 waterflood over there. That was carbonates, and they could somehow look for new places to drill. But I should

ask you questions pertinent to what we're doing here.

Basically, the gauges -- is there gauges in some of these wells, or are some used for monitor wells or bottomhole permanent guages? How do they --

A. We don't have a permanent bottomhole gauge in there. But if we're concerned about being able to extrapolate the bottomhole using a gas gradient, if we're concerned about standing liquid, we'll shoot fluid levels to make sure that we do the proper extrapolation.

Occasionally, we will put -- like in the recent well we drilled, of course we got bottomhole there. We know what that pressure is directly.

Q. And they're pretty confident about what goes in, I guess, because they're real careful about it being pure methane or just a little bit of ethane going in and no inerts; is that correct?

A. Yeah. Pretty much the customer gives you gas off the pipeline and, you know, you pretty much have to warrant that gas on a BTU basis that I'll return that same gas to you. I am going to charge you a warehouse fee, but I'm going to store your gas. I'm going to give you back the same heating value, not the same BCF or whatever. I'm going to give you the same heating value back.

So then in the process of 35 years of taking

gas one day and delivering it the next, things can get questionable. And if you look around the industry, gas storage industry, not every reservoir operates like this one.

This one is -- you know, it's not in a class by itself, but it's what we call a volumetric reservoir. It has a constant volume pore space, and that allows it to operate predictably and repeatedly up and down this linear trend line.

So the operator and the customer and the owner, they all have confidence that if I know the pressure, I essentially know how much gas I have in storage. As opposed to them going over and checking with gas accounting, who's been metering everything in and out and doing the conversion between MCF and the calorific value of the gas.

But it's all monitored, and that's what -- the point I'm trying to make here is that we've been operating routinely up and down this line all the way to this March 2009 point. So what's at issue today is just a request to expand that one little increment right above that. That will give us extra capacity, as well as deliverability and more value to the project.

Q. The 5,000, was it picked because, not only it's a safe number, but is it something to do with the

agreement with the State Land Office or the BLM?

A. Not really. I think my colleagues will agree with me here that the 5,000 really has to do with a practical kind of mechanical limitation on the ratings on our pipes and things like that.

Q. That initial discovery pressure, is that pretty reliable? How many points were taken there? I mean, are you pretty confident in that?

A. Yes, we are very confident in that. Because you can look at the Morrow all around here and find these -- you know, the Morrow is notorious for being compartmentalized. So you can find this discovery pressure at lots of places at this depth. It's not just our compartment. You can see that same discovery pressure lots of places.

Q. And so this kind of -- you've got, pretty much, two reasons. It's a mechanical reason -- it's about 2000 pounds below the discovery pressure, and for the last 35 years, you've operated below this. But now the volume in the reservoir is higher than it's been in a long time; is that correct?

A. Over the last five years, we have ramped up in capacity just because the demand for our service was there. And like Darryl Gee was saying, if that demand is there in the future, we would like to be able to utilize,

fully utilize the pore space in our unitized interval.

Q. You bet. When you produce back to deliver, I guess most of these wells were fractured initially; is that correct? So they got artificial placement of sand inside the Clastics?

A. I'm not the one to speak to the completion of the wells.

Q. I guess what I'm getting at is, if you produce back too fast, sometimes on gas wells you can cough back some sand.

A. Sure. Yeah.

Q. Could you see that on your model?

A. You can't really see that on a reservoir model. But certainly that's a concern throughout the gas storage industry is draw down. So that's why we do back-pressure testing and look at maximum draw down that we're going to allow on any given well, because we don't want to compromise our completion, especially if we have gravel packs and things like that. So that's a consideration.

A lot of storage facilities even have density monitors on their well heads, that if any sand starts flying up, the alarm goes off and it will actually shut in and things like that.

Q. As far as if you -- some of these times when

it produced down to lower volumes, did any condensate come out? Do you have a condensate -- a yield of barrels per million, they call it, versus cumulative curve on this thing?

A. The original gravity of the gas -- I mean, this reservoir here wasn't discovered with any kind of little oil leg or anything associated with it. It's pretty much a dry gas reservoir.

But I would guess that -- I think we have all that information. But if you think about it -- I don't have the number on the tip of my tongue -- but you're looking at 10 or 12 billion cubic feet of gas here that we cycle all the time. So whatever liquids are remnants of any richer native gas that was here, it's long been diluted, because we cycle so much pipeline gas in and out.

Q. Okay. Does your model show you that you could possibly add more wells, or does it pretty much show that one or two wells can fill the whole reservoir? Because Ms. Devine talked about some of those Morrow sands being continuous and some not. I mean, some of them were there and some of them weren't, so --

A. Right. Again, that goes back to the confidence we have in reconciling the pore space that Ms. Devine has mapped with the pressure and and inventory

relationship that the field has actually exhibited.

EXAMINER FESMIRE: Calculated volume.

A. Right. They reconcile together. So we expect that this Morrow interval that we have is a constant volume tank, and all we're going to do is go on up to a little bit higher increment in pressure, but still below the original gas in place pressure. And that would enable us to add a little more value to the project, put another couple of BCF that the customers can use. But we don't expect any type of surprises as far as integrity of the rock or compromising any seals or anything like that.

EXAMINER JONES: Okay. I don't have any more questions.

What they're asking, Mark -- Mr. Carr could summarize it a lot better.

On the completion of the last well -- or maybe it was already completed years ago and it was just converted to storage. What we were wondering about is on the ISIP, if you look at the historic well records, sometimes the theory is the ISIPs are similar to the fracture pressure. Although, I know some of the EPA people we work with say be careful about that.

But, theoretically, you would think it would be similar. But I guess, you know -- anyway, did you look at any of that?

THE WITNESS: This Morrow is over-pressured with respect to normal hydrostatic anyway, you know. So not being a geologist, I'm not sure that I'd want to get into a technical discussion of what the implications of that are.

But what I can say is that the pressure gradient that we would be operating at here is, I think, well below any kind of frac gradient that would be attributed to the Morrow. It's got to be at least one p.s.i. per foot, I would think.

EXAMINATION

BY EXAMINER FESMIRE:

Q. What I'm getting at is, you're not going to inject above the fracture pressure, but that fracture pressure is going to change with reservoir pressure. Has the reservoir been frac'd? Do you have any idea what that fracture pressure is at a given pressure?

A. I didn't come prepared to talk about the completion and fracture history. Let me ask if there's anybody who knows anything --

MR. BARRON: I know they have been frac'd, but I can't tell you the ISIP. I don't have that information with me. But it was a higher pressure than what we're planning to store at, I know that. I don't remember what it was.

EXAMINER FESMIRE: When you say "plan to store," you mean the average reservoir pressure restoring that? What about the pressure differential across the sand face at injection? That's what I'm concerned about. I'm making sure that stays below the fracture pressure at whatever condition the reservoir is -- at whatever pressure the reservoir is at.

MR. BARRON: Again, they were fractured at low reservoir pressure. They did frac jobs on them. And, again, those --

EXAMINER FESMIRE: Those ISIPs wouldn't tell us anything?

MR. BARRON: ISIPs were less than the storage pressure we're proposing here.

THE WITNESS: By the way, at this level of pressure, the static head of gas will give you an extra, you know, 1,300 pounds or so of pressure at the bottomhole.

But when you start injecting into the well, being 12,000 feet deep, at that pressure level the friction will actually work against you there, and the pressure you put on the bottomhole will be less than it would be if the well was just shut in. That's the way that's going to happen.

So as far as a delta P across the sand face

you're talking about, on injection these wells have -- you know, due to their high receptivity to gas, to receiving gas without a large delta P, that the so-called productivity or injectivity index assigned to an individual well right here is very high. So we don't experience much in the way of sand face or localized draw down. We certainly don't see anything like non-darcie type flow or anything like that.

But that goes to your question earlier. If you were to infield drill within this fault block, then you could partial out the overall targeted injection rate or flow rate and bring it down on average to each well. But these wells will produce and inject at will. They're not -- we're not having to hammer these things in order to get that gas in. So the permeability and the receptivity of the wells is very good.

Q. (By Examiner Fesmire) So you're not concerned with ever having to force the pressure to a fracture gradient, whatever the condition of the reservoir is?

A. No.

EXAMINER JONES: Do you also do an nodal analysis of the thing? You guys probably have those models.

THE WITNESS: We have the models these days that not only model the flow in the individual pores

down in the reservoir, but it simultaneously solves the flow and pressure up the tubing string and into the horizontal pipes and into the compressor, and it actually models the compressor algorithm and goes out to the pipeline where you have some boundary condition that sets the delivery point right there. So that whole system is modeled simultaneous.

EXAMINER JONES: So your nodal analysis and your reservoir simulator are connected?

THE WITNESS: It's all what we call fully coupled. So we've got a pipeline simulator and a finite difference reservoir simulator all hooked together. It's really nice.

EXAMINER JONES: I am not sure we can hammer this anymore. It sounds like -- if Mr. Carr will give us a draft order --

MR. CARR: I'll be happy to do that.

And Mr. Fesmire, what we're doing is 35 years after this project initially began, we're finishing the effort that you described a year and a half ago as re-booting this project to bring it in line with all current regulatory requirements. We've done that with the BLM with a restated agreement. We had re-negotiated agreements with the Land Office.

Last year the OCD approved injection in the

well in Section 9 at 5,000 p.s.i.g., and as you recall, we agreed as part of that that we could continue to operate, but we would come back with a C-108 on each of the remaining four wells. So today we're wrapping it up.

As I noted earlier, this order will be the 21st order entered by the OCD involving issues in Grama Ridge. And I also pointed out a very sad fact, that I've been present for all 21.

EXAMINER FESMIRE: This is a great project. I've always been enamored with it.

MR. CARR: I'd be happy to give you a proposed order.

EXAMINER FESMIRE. It will save a lot of work.

EXAMINER JONES: With that, we'll take Case 14518 under advisement. We'll break until 1:00.

* * *

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 _____.

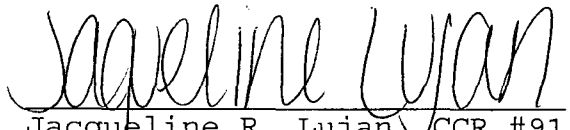
_____, Examiner
Oil Conservation Division

REPORTER'S CERTIFICATE

I, JACQUELINE R. LUJAN, New Mexico CCR #91, DO HEREBY CERTIFY that on July 22, 2010, proceedings in the above captioned case were taken before me and that I did report in stenographic shorthand the proceedings set forth herein, and the foregoing pages are a true and correct transcription to the best of my ability.

I FURTHER CERTIFY that I am neither employed by nor related to nor contracted with any of the parties or attorneys in this case and that I have no interest whatsoever in the final disposition of this case in any court.

WITNESS MY HAND this 4th day of August, 2010.



Jacqueline R. Lujan, CCR #91
Expires: 12/31/2010