PUBLIC HEARING

STATE OF NEW MEXICO

OIL CONSERVATION COMMISSION

Pecos Hall, 1st Floor, Wendell Chino Building

1220 S. Saint Francis Drive

Santa Fe, New Mexico

TRANSCRIPT OF PROCEEDINGS

April 10, 2025

VOLUME X

HEARD BEFORE:

HEARING OFFICER RIPLEY HARWOOD

COMMISSION MEMBERS:

GERASIMOS ROZATOS, Chair

BAYLEN LAMKIN, Member

DR. WILLIAM AMPOMAH, Member

COUNSEL TO THE COMMISSION:

MR. DANIEL RUBIN, ESQ.

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I N D E X

(On the record at 10:30 a.m.)

TRANSCRIPT OF PROCEEDINGS

CHAIR ROZATOS: Good morning to everybody. Today is Thursday, April the 10th. This is the continuation of our Oil Conservation Commission hearing. My name the Gerasimos Rozatos. I am the acting director of the Oil Conservation Division and also the acting chairman of the Oil Conservation Commission.

We are continuing our evidentiary hearing, the consolidated cases by Goodnight Midstream and Empire New Mexico. The case numbers are as follows: 24123, 23614 through 17, 23775, 24018 through 24020, and 24025. As I stated, this is the continuation of the evidentiary hearing.

Mr. Hearing Officer, I transfer this hearing back over to you.

HEARING OFFICER HARWOOD: Thank you, Chairman Rozatos. Good morning everybody. Let's see. Do we have court reporter? Okay. Great.

So first of all, thank you, Dr. Ampomah for -- I may speak for everybody on this. Thank you for a relaxed morning.

So is there a motion to start off the day with our mid-morning break?

All right. Okay. So let's see, we are still on Mr. Rankin's cross-examination of Mr. West, correct?

MR. RANKIN: Correct, Mr. Hearing Officer.

HEARING OFFICER HARWOOD: Mr. West, I'll just remind you that you're under oath.

You may proceed, Mr. Rankin.

MR. RANKIN: Mr. Hearing Officer, before we do, just one point of order for housekeeping matters, and I discussed this with counsel for Empire. I had circulated an anticipated witness list for Goodnight once we get our case started.

I'm making a slight modification to that, just due to witness availability. Mr. MacBeath will be unavailable to be here in Santa Fe the third week of April, when we resume. So, for that reason, I'm going to ask to move him up from second in order to first in order, because I think it would be very important to have his testimony be in person.

HEARING OFFICER HARWOOD: Okay.

MR. RANKIN: And I discussed that with Empire, so they're aware.

HEARING OFFICER HARWOOD: All right. So assuming Empire's case is done sometime today, it would be your first witness?

MR. RANKIN: He'll be my first witness.

THE COURT: And no objection to that, Ms. Hardy?

MS. HARDY: Mr. Examiner, we don't object to moving him up in the order. We would like -- if we do get to Mr. MacBeath, we were prefer to do it tomorrow.

I don't know that we're going to finish Mr. West today, so that may not be an issue. But we weren't prepared to have Mr. MacBeath go.

MR. RANKIN: I understand the issues around that. It's not easy when there's shuffling of witnesses. I believe that was an issue on our end, as well. I'm not doing to it make it difficult for Ms. Hardy.

But if there's a way we could at least get his summary presentations done. I agree with her. I'm not sure we're going to actually get to Mr. MacBeath today, but if we do, I would like to at least get his summary presentation done, potentially. But we'll confer during a break with counsel for Empire.

THE COURT: Well, let's see how the day goes. But it seems reasonable, then, if -- is it Mr. MacBeath?

MR. RANKIN: It's MacBeath.

HEARING OFFICER HARWOOD: If Mr. MacBeath -- it seems reasonable that Mr. Rankin could get through the direct exam, if time permits. And hopefully, time will permit.

I don't want to make any advance rulings on your request, Ms. Hardy, because the effect might be to unnaturally prolong cross-examination.

MS. HARDY: And we are fine with Mr. MacBeath doing his direct examination today. It's just the cross that we would like to do tomorrow.

HEARING OFFICER HARWOOD: All right. For now, let's play it by ear. But, Mr. Rankin, thank you for heads-up. And are you ready to proceed?

CHAIR ROZATOS: Mr. Hearing Officer, I apologize. I also have just a slight wrench for tomorrow. I do need to be done by 3:45 tomorrow, so just keep that in mind with the cross-examinations and everything. We need to kind of cut a little shorter tomorrow, so I just wanted to throw that out there, by 3:45.

HEARING OFFICER HARWOOD: Okay. Thank you. Reminding all of us that time is always of the essence.

All right Mr. Rankin.

MR. RANKIN: Thank you, Mr. Hearing Officer. Thank you, Commission Chair, Commissioners.

WILLIAM WEST,

having previously been duly sworn,

testified as follows:

CROSS-EXAMINATION (Cont'd)

BY MR. RANKIN:

Q. Good morning, Mr. West.

A. Good morning.

Q. I'm going to pick up with your Slide Number 8 from your summary testimony of your direct examination by Ms. Hardy. And this slide is a slide that we talked about a bit yesterday, Slide Number 8 of your presentation, and it's your Exhibit I-5 from your direct testimony.

As part of your analysis of water production in the EMSU, did you evaluate the completion intervals for the wells that you've identified on this exhibit?

A. They're completed in the Grayburg.

Q. Did you evaluate the specific zones within the Grayburg that they were completed in as part of your analysis and assessment of water production?

A. In this slide here, it sums them all up just

as "Grayburg."

Q. I understand that. But as part of determination about whether or not there are other factors or other sources of water that may have explained the water production values here, did you evaluate what zones they were completed in?

A. Yes. When we were doing the full evaluation, we looked at the wellbores and to see where they were completed.

Q. So you incorporated that consideration into this analysis?

A. Yes, sir.

Q. And based on your assessment, you determined that there's no other explanation for these water production values but for communication with the San Andres?

A. That's the most likely.

Q. And you ruled out, then, potential encroachment from Goat Seep?

A. There is a small encroachment that's, you know, from the Goat Seep. But that's all the way to the far west.

Q. How did you rule it out? Did you rule it out?

A. Well, if you're high up on the structure,

it's hard to bypass the other wells and get the Goat Seep up to those high structure wells.

Q. You showed us an exhibit from Mr. Lindsay that showed how, based on his testimony and his measurements, Goat Seep water is encroaching all the way up to the top of the structure. Agreed?

A. I don't think that's what the exhibit showed.

Q. You were here for Dr. Lindsay's testimony, weren't you?

A. Yes.

Q. And you didn't hear him testify that the Goat Seep was encroaching to the top of the structure?

A. I do not remember that.

Q. And you're in charge of operations for EMSU on behalf of Empire, correct?

A. That is correct.

Q. And as part of head of operations for the EMSU, you would be charged with understanding all the engineering factors that potentially would affect operations and production in the EMSU, correct?

A. That is correct.

Q. Okay. Now, as far as encroachment, what was your evaluation? What did you do to evaluate the potential effect of Goat Seep encroachment as part of

your analysis?

A. So one thing you look at is the production from the wellbores and the pressures. Like, the pressure data we showed you earlier, is that those pressures in those zones drop down to low pressure, 2- to 300 pounds on RFT. So if you had a strong aquifer support, you would have more pressure.

Q. Do you have --

A. And it's well documented that this is a solution drive reservoir in the Grayburg.

Q. Do you have RFT pressures for these wells, showing that these wells with the high water production have low wellbore pressures?

A. Not all of them. But if you go to the RFT on the 211, you can see that those zones had lower pressure.

Q. Is the 211 identified here as a well that has high water production?

A. I don't remember exactly whether the 211 is on here.

Q. Isn't it up here in Section 32?

A. We'd have to put on the map. I don't know.

Q. But as I sit here and look here today, I don't see that EMSU 211 here. Do you see it on your map?

A. I do not. But it's an example of, you know, how the pressure is lower in the wellbores, and, you know, that it's pulling down, indicating that you don't have a strong aquifer support.

Q. If the 211 truly had low pressure -- and isn't the 211 in your analysis completed in -- or isn't it completed partially within the upper San Andres?

A. The 211 has RFT pressures through, you know, a section including all the way down into the San Andres.

Q. So if it's got low pressure, why isn't it showing up here as a well that has high water volumes, if it's pulling water up from the San Andres? If the San Andres is overpressured at this point and would be drawing -- pushing water up into the Grayburg, why isn't the 211 one of the wells you have identified as having a high excess water production?

A. I didn't say that it would have high excess water production. I said that it shows that the reservoirs in the Grayburg are depleted, showing that there's not a strong aquifer support.

Q. But I think one of your explanations was that the lower pressures in the wellbores would be indicative of the lower pressure in the Grayburg,

correct?

A. Lower pressure in the Grayburg would be lower pressure in the Grayburg.

Q. Okay. And as a result of lower pressure in the Grayburg, my understanding from your testimony is that the San Andres is at a higher pressure than the Grayburg at present, correct?

A. That is correct.

Q. And higher pressure in the Grayburg, based on engineering principles, would push water up into the Grayburg. Isn't that your opinion?

A. In the lower zones of the Grayburg; that is correct.

Q. Okay. And so why aren't we seeing the EMSU 211 as one of the wells identified on this exhibit with high water as a result of influx from the Grayburg -- or rather, influx from the San Andres?

A. I think it's irrelevant to this slide.

Q. Okay. Now, when you reviewed this slide yesterday, I think I understood you to say that when you discussed it, that there's no set pattern in the way the water production shows up here across the EMSU; is that correct?

A. Yes. You can see that there's no one big cluster of water. So if you had a strong water influx

from the Goat Seep, all the ones to the far west would have a lot of water, because that's closest to the Goat Seep as you're coming off the structure.

Q. Okay. Now, I asked you yesterday -- we discussed this a little bit. You said in your testimony that you believed it's well documented in different papers that there's water migrating from the San Andres into the Grayburg in the EMSU, correct?

A. That's correct.

Q. Okay. We talked a little bit about the papers and sources that you could cite or relied on. And then I asked you whether you were aware of any papers, starting in the 1930s, that documented that there was water encroachment in the EMSU. Do you recall the discussion yesterday?

A. I recall the discussion.

Q. Since we had that discussion, have you had a chance to refresh your memory or do any additional work to determine whether you're aware of any papers from the 1930s that address that issue?

A. I did go back and look to try to find the 1930s paper. I did find one, but I don't know which one you're referring to.

Q. I'm going to pull it up on my screen, this paper from July 1939.

MR. RANKIN: Mr. Hearing Officer, I'm going to move the admission of this as Goodnight Cross Exhibit Number 18. This is a United States Department of the Interior Bureau of Mines paper.

That's a report of investigations relating to reservoir characteristics of the Eunice oil field in Lea County, New Mexico.

HEARING OFFICER HARWOOD: Any objection from Empire?

MS. HARDY: No objection.

HEARING OFFICER HARWOOD: OCD?

MR. MOANDER: No objection.

HEARING OFFICER HARWOOD: Rice?

MR. BECK: No objection.

HEARING OFFICER HARWOOD: Pilot?

MR. SUAZO: No objection.

HEARING OFFICER HARWOOD: It'll be admitted.

BY MR. RANKIN:

Q. Mr. West, is this the paper that you reviewed last night or this morning?

A. Parts of it I did review this morning.

Q. Prior to reviewing it this morning, were you familiar with this paper at all?

A. No, I was not.

Q. So you weren't aware that Goodnight's

experts, starting with this direct testimony filed in August of 2024, cited to and relied on this paper in this case?

A. I can't say I remember every reference.

Q. Okay. So prior to yesterday when you reviewed it, you were not aware of this paper and its analysis in 1939 in the Eunice Monument South area?

A. I can't remember every exact paper that I looked at. But I do not remember as of yesterday that paper.

Q. So because you have no memory of it, it appears to me that you didn't rely on this paper in your assessment of water production in the EMSU, correct?

A. No.

Q. Okay. And prior to yesterday, you're not familiar with the paper and its description of different zones within the field and how they're isolated by low porosity and permeability intervals?

A. There's definitely different zones in the field.

Q. I'm asking about this specific paper and its analysis. Prior to this morning, when you reviewed it, were you familiar with the description in the paper regarding the variable porosity and permeability

and its effect on well production across the field?

A. You'd have to show me on it. But no, if I didn't look at before this morning, then I probably wouldn't know, right?

Q. I'm just trying to confirm that. Prior to this morning, you didn't incorporate any of the findings or analysis in this study in your assessment of the effect of water on the EMSU, correct?

A. Correct.

Q. Okay. Now, you mentioned also yesterday a Love paper by Mr. Love; do you recall that?

A. Yes, sir.

Q. And I mentioned yesterday we had discussed that paper extensively during Dr. Lindsay's testimony. And at the time it was marked as Goodnight Cross Exhibit Number 1. Do you recall that discussion with Dr. Lindsay?

A. Yes, sir.

Q. And I think yesterday, you mentioned that you thought that this is one of the papers you cited as I think potentially discussing some aspect of the San Andres creating an influx into the Grayburg; is that correct?

A. Yes, sir.

Q. Okay. So this is the Love paper that you're

referring to?

A. Yes, sir.

Q. Okay. Do you disagree that this paper addresses and confirms that there are conformance issues within the EMSU?

A. It discusses the conformance issues; that is correct.

Q. Do you disagree that the conformance issues it addresses in this paper are the same issues that you've highlighted here in your Exhibit I-5?

A. No. Those are different conformance issues.

Q. You think they're different conformance issues?

A. Yes.

Q. How are they different? What's different about them?

A. This is indicating that you've got -- you know, so the Love paper, you're talking about the zones coming across. You're talking about when you're actively waterflooding. This slide is before the waterflood, so this is production before the waterflood. And the paper is addressing waterflood conformance. Two separate subjects.

Q. So you're telling me that the Love paper does not address in any way the effect of edge water

coming in and affecting water production in the EMSU?

A. I mean, there's a light aquifer support from the Gray reef.

Q. Okay.

A. Goat Seep. Sorry about that.

Q. So your opinion is that these issues here identified in your Exhibit I-5 are separate and unrelated to anything or any of the analysis discussed in Mr. Love's 1998 paper?

MS. HARDY: Object to the form. I think it misstates Mr. West's testimony.

MR. RANKIN: I'm trying to clarify, which is why I'm asking the question.

HEARING OFFICER HARWOOD: Just rephrase the question, if you would.

BY MR. RANKIN:

Q. Well, Mr. West, I'm trying to think what I asked and how I asked the question.

So what I'm getting at, the point is, you're telling me that you think that the Love paper addresses a different issue because it's related to just conformance within waterflooding and not the effect of edge water on those conformance issues. Is that a fair characterization of your opinion?

A. The Love paper affects waterflood

conformance issues.

Q. Now you're telling me that it does not address the affect of edge water on those conformance issues?

A. It might, but you're in a waterflood at that point in time. It might mention it in there. I can't remember that.

Q. I'll go ahead and pull it up. And I guess my point is, Mr. West, that here it goes on and talks about -- you're correct, it talks about conformance, the variability of the porosity issues, the high circulation, zones of high production of water. And then it talks about the focus area.

And the first sentence of this description about the focus area, which is on I believe Page 4 of the document, states that conformance problems were observed over the entire field. Did I read that correctly?

MS. HARDY: Mr. Examiner, I object to Mr. Rankin testifying. There was a long list of testimony before Mr. Rankin got to his question.

HEARING OFFICER HARWOOD: All right. Mr. Rankin, it's a fair objection. Try and just -- I know you're trying to lay a preamble in a complex technical area, so it's a judgment call. But try and

bear that in mind if you would, please.

MR. RANKIN: Okay. I'll restate the sentence, the question.

BY MR. RANKIN:

Q. On Page 692 of the paper, Page 4 of the document, it states, "Conformance problems were observed over the entire field."

Did I read that correctly?

A. That is correct.

Q. And it cites to Figure 7 to support that statement. Agree?

A. Can you show me Figure 7?

Q. I will. So there's Figure 7. It states that wells that have symptoms of poor reservoir conformance are marked by a large circle. Do you see that?

A. I see that.

Q. And then under the title of that image, it says "Edgewater drive." Do you see that?

A. I see it on that image.

Q. It's not titled evidence of San Andres bottom -- San Andres bottom water plumes.

A. So if we can, like, set up in context to go up in the paper to describe the zones.

Q. Yeah.

A. So if you could scroll up.

Q. What are you looking for?

A. Scroll up. I'll tell you when. It'll say the zones, how it defines the zones, Zone 1, Zone 2, Zone -- up a little bit higher. Keep on going. Next page. All right. Right here. See there's Zone 4, Zone 5. Go ahead and scroll up so you can see Zone 1, Zone 2.

Q. You want me to go up?

A. Yes, just a little bit farther.

So when we refer to the -- you know, the -- you know, so it's talking down below about Zone 1 and Zone 2, so when you refer to that, that's where it ties back to the EMSU 211 RFTs, you're taking in that Zone 1 and Zone 2, which has very high permeability streaks. And those pressures are low. If you're getting that much edge water support, you wouldn't have that lower pressure there. Okay?

I do think it's important here to go to Zone 4. And where it describes Zone 5, which is, it says, typically a water drive, it has, you know, a little bit more water in Zone 6, and Zone 5 and 6 says that it overlies the top of the San Andres and contains an inconformity in the upper part and that there's oil wells shown well down into the San Andres.

So it's kind of -- it confirming here that Zone 5 and Zone 6 is in direct communication with the San Andres and the contributing water.

Q. Where does it says that Zone 5 and Zone 6 are in direct communication with the San Andres contributing water?

A. It says that it's a high -- you know, it's a higher -- it's typically a water drive and that it is, you know -- that it includes the top of the San Andres, you know, into what they consider Zone 6.

Q. It says it overlies the top of the San Andres. It doesn't say includes the San Andres?

A. Overlies, you know -- you know, it's implying here that the San Andres is part of that zone. Consider it impacts that lower zone of the Grayburg.

Q. That's your opinion?

A. Yes. That's what it, you know, says. And it says oil shows well down into the San Andres; another proof of record that there's historical records of oil in the San Andres.

Q. No, Mr. West, I'm not talking about oil yet. I'm talking about water. We can talk about oil later. And Mr. Knights addresses that specific quote in his analysis. But I'm asking about what here, and you

told me that "overlies" is the same as "includes"?

A. If there's fractures in between that connects. I mean, they were using it in the same context as a zone here.

Q. Does this paper address fractures or does it say anything about communication or influx of water from the San Andres into the Grayburg?

A. That's saying that it's typically a water drive from the zone, including --

Q. Okay. And where it says that it's a water drive, in Figure 7, it talks about edge water, doesn't it? And it shows in the analysis -- talk about implications, it's implying that performance issues are a direct result of the edge water, correct?

A. It doesn't say that. It says that --

Q. It doesn't say "Edgewater drive"?

A. It says that wells have symptoms of poor reservoir conformance, and they are marked by a large circle.

Q. That title of the figure does not say "Edgewater drive"?

A. That's what that says. But there's no implication of what it's telling. It says "thin gas cap" up at the top, too.

Q. Okay. So over here, where it's interpreting

or discussing the figure, it's saying that "Conformance problems observed over the entire field," correct?

A. That is correct.

Q. And it refers down to Figure 7, which is titled, "Edgewater drive," correct?

A. It's not titled. It's a -- it says it there. Probably implying that, you know, that southwestern corner, that that's where it was affected from. They put it on that graph. That is not a title. That's a label.

Q. Okay. And your own expert, Dr. Lindsay -- and you're telling me you don't recall his testimony, but this figure shows that there is the Goat Seep, which is by Dr. Lindsay's own testimony, the edge water that encroaches all the way up to the top of structure. Do you disagree?

A. Yeah. It has some, you know, mix in there of the edge water.

Q. Okay.

A. But it would be -- not have the sulfate, right? So you wouldn't have the barium sulfate problem.

Q. Going to your Exhibit 9, which is same topic here, this is your Exhibit I-6 from your direct

testimony, correct?

A. That is correct.

Q. And this is an image or figure from a 1983 Technical Committee Report, correct?

A. That's correct.

Q. I thought I had pulled it up. I apologize. I have so many files in your folder, Mr. West.

A. There's a lot of documents to keep straight, there's no doubt. This is big case and a lot of technical things. Forgive me whenever I don't recall off the top of my head.

Q. That may be the reason I didn't open it, because it's a big file.

So is this the 1983 Technical Committee Report that you were referring to in your testimony?

A. Yes, sir.

Q. Okay. And you and I discussed this yesterday. Do you recall when I was asking you -- when we looked at this figure on your PowerPoint on Slide Number 9, I was asking you whether or not there was specific reference in the Technical Committee Report that interpreted this image, indicating that it was reflective of an influx of San Andres water into the Grayburg. Do you recall that, yesterday?

A. I remember the discussion. But talking

about the paper, I don't remember exactly. But I'll take your word for it.

Q. So what I'm asking you here now is, do you recall any specific language, discussion, analysis relating to this figure from the 1983 technical report or anywhere in the technical report that discusses a determination or conclusion or even an indication that there's an influx of San Andres water into the Grayburg?

A. I'd have to reread it. But, you know, this is where it's showing historical high plumes of water production.

Q. Okay. But that's different than what you said yesterday, isn't it?

MS. HARDY: Objection.

MR. RANKIN: I'm asking if it's different than what he said yesterday.

A. I do not recall fully what I said yesterday in reference to this particular one. We were talking about a lot of historical references, and I don't remember my exact wordings on this one.

Q. So as you sit here today, you're telling me that --

CHAIR ROZATOS: Mr. Rankin, I'm going to interrupt for a second. There was an objection that

was raised. The Hearing Officer did not get a chance to make his decision.

I mentioned this many times before, you guys. We need to keep decorum in here. There was an objection raised. The Hearing Officer has to make his decision before we continue. Please make sure you follow these rules.

MR. RANKIN: I apologize.

MR. ROZATOS: Mr. Hearing Officer, there was an objection. I turn it back over to you.

HEARING OFFICER HARWOOD: Thank you. I guess I didn't hear that.

All right. I'm going to have to go back and see what the question was.

MS. HARDY: I think Mr. Rankin rephrased his question.

HEARING OFFICER HARWOOD: The question was, you asked him if what he said today is different from what he said yesterday. Okay. That's a fair question. Objection is overruled.

MS. HARDY: That wasn't my objection. My objection was to his prior question. He then rephrased it to ask the question that you're mentioning. So I don't object to the rephrased question. Thank you.

HEARING OFFICER HARWOOD: Okay. That cures it. All right.

MR. RANKIN: I apologize, Mr. Chair, Commissioners, Ms. Hardy. I didn't mean to curtail the opportunity to address the objection. I apologize.

HEARING OFFICER HARWOOD: That's all right. And while we're talking about decorum, both of you please try and remember not to talk over each other for the sake of the record and especially the court reporter. Thanks.

BY MR. RANKIN:

Q. Mr. West, you can answer the question.

A. Can you restate it. I don't remember after that.

Q. What you said today about this image or this chart shows water production values, is different than what you stated about the chart yesterday; is that correct?

A. I don't remember what I stated exactly yesterday. This is, you know, depicting high water cum values in different points whenever it was put together, prior to the waterflood.

Q. It is your opinion that this chart shows an influx of water pluming from the San Andres into the

Grayburg?

A. I believe that it gives you -- I mean, that is a great indication of that, would be a way that you would get the isolated plumes of water into the structure.

Q. Okay. Now my necessary, Mr. West, is there anywhere in that 1983 Technical Committee Report that interprets this chart to indicate that that there is an influx of San Andres water into the Grayburg?

A. I do not remember.

Q. So since our discussion yesterday, where I raised with you, did you have an opportunity to go back and review the 1983 technical report to find any such language?

A. I did not review the entire report.

Q. Okay. In your exhibit here, I-6, you refer to this chart. I'm going to skip down to it. I'm just going to make sure that this is -- so we have the whole page. This is the page that you pulled for your exhibit, correct?

A. Yes. That's the diagram.

Q. Okay. And it's titled "Eunice Monument South Unit Mesh Perspective on 1981 Water Production," correct?

A. That is correct.

MR. RANKIN: Mr. Hearing Officer, I'm going to go ahead and move into admission the 1983 Technical Committee Report from April 1983, and I'll mark it as Goodnight Cross Exhibit 19.

HEARING OFFICER HARWOOD: Empire, any objection?

MS. HARDY: No objection.

HEARING OFFICER HARWOOD: OCD?

MR. MOANDER: No objection.

HEARING OFFICER HARWOOD: Rice?

MR. BECK: No objection.

HEARING OFFICER HARWOOD: Pilot?

MR. SUAZO: No objection.

HEARING OFFICER HARWOOD: All right. It will be admitted.

(Admitted: Goodnight Midstream Cross Exhibit 19.)

BY MR. RANKIN:

Q. Mr. West, I did a search on this, and I'm not going to subject everybody in this room to it, but I could find no direct discussion, interpretation of this figure. Just so we can see, it's listed as Figure 12 in the Technical Committee Report. I could find no direct interpretation or discussion of this figure in the Technical Committee Report.

Do you recall yourself seeing any interpretations or discussion of this figure in the Technical Committee Report?

MS. HARDY: Object to Mr. Rankin testifying about what he found in the report.

MR. RANKIN: That's fine.

BY MR. RANKIN:

Q. Mr. West, are you able to identify yourself any discussion of this figure of the Technical Committee Report?

A. I can't say I remember that 167 pages right now. This was used in our frame of reference at the time of water production from the field.

Q. Okay. But you're presenting this as evidence of or at least indication of communication between the San Andres and Grayburg, correct?

A. That is correct. That is an indication of communication where you have historical high water volumes up structure, and down structure, you do not.

Q. Okay. So you're telling me that this grid is all on the high structure; is that correct?

A. I mean, it covers a big chunk of the field, right? But you could probably see on here the two folds that Lindsay shows there, where you would have the fracturing, right? You got the one initial hump

and the you got the next initial hump that they kind of line up.

Q. I don't see any structure on this. This is a mesh -- isn't this a mesh perspective on water production?

A. That is correct, and it's structural in there. But, you know, you've got the double humps coming across the field from, you know, downdip. You got the first hump, and you kind of have that line of higher water there, and then you have a dip, where there's none. And then you have where the structure gets reflexed again. You have a line of higher water production again.

Q. So your opinion is that this water production correlates to the structure; is that correct?

A. That's indicating where you would have, you know, fracture zones that Mr. Lindsay indicated of those flexures.

Q. So the pattern here, potentially, would be based on structure. Agree?

A. It would be where there's flexing and fracturing. And whenever the rock is bent, especially a dolomite, there's a lot of fracturing that occurs and more vertical perm.

Q. I'm going to skip over 10 and go to Slide 11 here. This is an exhibit from Dr. Buchwalter, correct?

A. Yes, sir.

Q. And on the left is a snippet that applies the -- discusses the Arrowhead Grayburg Unit, or AGU. Agree?

A. That is correct. It is from the Chevron unitization, I believe, technical.

Q. And in this case before the Commission currently, there's no testimony or evidence to establish what the depths are of the San Andres and the Grayburg in the Arrowhead Grayburg Unit. Agree?

A. I don't know for 100 percent fact.

Q. As you said here, you can't recall any testimony or facts or exhibits presented by Empire or anybody else that address or clarify what the San Andres or Grayburg depths are the AGU. Agree?

A. Correct. This has been on the EMSU. But in this paper, they refer to the EMSU.

Q. Okay. On this snippet, does it refer to the EMSU?

A. It doesn't on this snippet, but if we pulled up the paper, it does.

Q. Why wouldn't Mr. Buchwalter -- well,

Mr. Buchwalter did not identify in this exhibit anything relating to the EMSU. Agree?

A. You know, the water production over to the right, that snippet, he has, you know, the higher water production, the EMSU.

Q. That's true. I'm going to talk about that in a moment. But as for the snippet included on the AGU, it does not reference the EMSU. Agree?

A. So you're referencing just what's highlighted in red?

Q. I'm referencing what Dr. Buchwalter deemed important to include in this exhibit.

A. It looks like to me that he deemed important, you know, water influx from the San Andres to the lower Grayburg, and he deemed important as the high production of water in different plumes in the EMSU.

Q. Doesn't say anything about the EMSU in that snippet, does it, on the left?

A. So you -- I asked you if it was in the red, if that's what you were referring to. And you said you were referring to the whole slide, so I went back to the whole slide. Are referring to just what is highlighted in the red?

Q. I'm asking you, the information that

Dr. Buchwalter pulled from the AGU report, does it reference anything about the EMSU?

A. It's just that snippet in the square box that does not have a reference to the EMSU in that.

Q. As to the AGU in this case, there's been no testimony or evidence to establish that what is referred to as the San Andres influx in this snippet here from Dr. Buchwalter that he refers to, is not just Goat Seep edge water coming up into the AGU from down structure. Agree?

A. It says that it's a solution gas drive. So if it's a solution gas drive reservoir, you do not have strong aquifer support.

Q. I'm asking you, though, Mr. West, that there's no testimony or evidence to establish that San Andres influx is not just Goat Seep edge water coming up into the AGU from down structure.

A. It couldn't be a solution gas drive reservoir if you had aquifer support.

Q. But there's been no testimony or discussion around the AGU in this case, agree, that relates to the edge water drive in the AGU?

MS. HARDY: Object to the form. I think lack of foundation.

MR. RANKIN: That's fine. I'll move on.

That's fine. I'll move on.

HEARING OFFICER HARWOOD: Okay. Hold on. I do have to rule on the objection, and so I'm going to sustain the objection, because I don't know how comprehensive they are, but my notes of Dr. Buchwalter's testimony include a statement where he said there's no evidence of strong aquifer coming into the Grayburg, for what that's worth.

MR. RANKIN: Okay.

BY MR. RANKIN:

Q. You reference this other image on the right that Dr. Buchwalter pulled from -- included in his testimony here. It is Exhibit M-3. And that's also from the 1983 Technical Committee Report, as well, correct?

A. That is correct.

Q. Okay. And to the best of your knowledge, Mr. West, as with the prior figure that we were just discussing in that Technical Committee Report, were you able to identify any discussion in the report about this figure or an interpretation to go with it?

A. I don't remember off the top of my head. We'd have to pull up the document and look at it. But it's a large document also.

Q. It is. But as you sit here, you can't

recall -- Mr. West, is Empire relying on this image of water production from 1981 to establish that there's communication between the San Andres and the Grayburg?

A. It's a piece of data indicating that you have an unexplainable high water production up structure.

Q. Now, it's your opinion that that water production is unexplainable; is that right?

A. No. Actually, you can explain it from water influx from the San Andres.

Q. Okay. Now, your opinion is that there's water influx from the San Andres and that this image is an indication of that. Agree?

A. It indicates high water where you wouldn't typically expect high water.

Q. Now, you reviewed the 1983 Technical Committee Report, didn't you?

A. I have at one time. I didn't do it last night.

Q. And you would have been looking for every detail or snippet of information that would support your position. Agree?

A. We're looking. Can't say I didn't miss any.

Q. Okay. But if you had found something that supported this interpretation of this image, you would

have included it in your testimony or in your exhibits. Agree?

A. Yeah. I mean, if, you know -- you know, to support the case. But that's a strong indication of water.

Q. Okay. I'm going to just skip down to where I believe that -- I'm not sure exactly what page that is on, so I will not attempt to find it. But you agree that it's in that Technical Committee Report, right?

A. That is where it stated that it came from, yes, I believe.

Q. And so while there's -- it does, I guess -- I reviewed this and I did find some discussion of information about communication. And here on Page 5 of the Technical Committee Report, the technical committee wrote, "At this time, there is insufficient data available to determine the degree of vertical reservoir communication." Did I read that correctly?

A. That is what you read there. And it looks like it's saying they had thoughts that there was vertical reservoir communication, or they never would have put it in the report.

Q. It's actually hard to tell its context, whether it's addressing vertical communication within

the Grayburg itself, or between the Grayburg and the San Andres. Would you agree?

MS. HARDY: Object to Mr. Rankin testifying about what the article says.

HEARING OFFICER HARWOOD: That's overruled.

A. It's talking about vertical reservoir communication.

Q. Can you determine, based on this paragraph of the context, whether it's discussing vertical communication between the Grayburg and San Andres or within the Grayburg itself?

A. It's talking about vertical communication.

Q. Okay. There are some other additional discussions about water production in the unit, and it discusses, at some length, the assessment of water production. And here on this page, which is Page 22 of the report, the technical committee states, "However, after analyzing individual well production records it is obvious that the water production is not evenly distributed throughout the field." Did I read that correctly?

A. Yes, you did.

Q. And that matches up well, with your Exhibit I-5. Agree?

A. Yes, with I-5 and the other exhibits of

different spots of high water.

Q. And then further down on that same page, it goes on to say that the technical committee attempted to make -- to correlate to determine whether that water encroachment was uniform. Do you see that, that I've highlighted here?

A. Yes. I'm just working on reading all of it.

Q. It goes on to say that after comparing water production, decline rates and structural position for the leases within the field, they determined that there was no clear trend. Do you see that?

A. Yes. So if you had edge water, you would have a clear trend.

Q. If the structure were uniform. Agree?

A. That structure, you got downdip, you got updip. You would have a clear trend. Clear trend would be in reference to structure.

Q. Are there not variations in porosity and permeability all through the Grayburg?

A. Yes. There is in any reservoir.

Q. Especially in a complex carbonate system, such as the Grayburg in the EMSU. Agree?

A. Yes. It is a...

Q. Okay. Now --

A. Flip back there real quick. You had one

other thing down at the bottom that I just wanted to read before you went off of it.

Considering the entire unit area, the water production does not indicate a strong uniform water drive mechanism. Okay. I just wanted to make sure I read that right.

Q. All right. Moving off that topic, here on the Slide 12, this is referencing your Rebuttal Exhibit N-8. Correct?

A. That is correct.

Q. And I think I understood you to say that this slide is no longer accurate because you've changed your opinion about the depth of the pressure datum. Correct?

A. That is correct. We changed it because it was referenced on the paper as 250. But it makes more sense, as my original analysis was a negative 250. And I incorrectly switched it to the 250 because that's -- I read the document for what it was.

Q. So rather than referring to N-8, I guess, should it be -- is it I-3?

A. Yeah. The original one would be a better one to talk from.

Q. Okay. So your testimony as it stands today is adopting I-3, not N-8, correct?

A. That is correct.

Q. And I guess my question is, why did you change your mind about that pressure datum?

A. Just to make sense that it matches up better with Mr. Buchwalter's original models of the pressure being proper, and that, you know, its position in the reservoir makes more sense.

Q. But no new data, correct?

A. No new data.

Q. And no new papers or information that you evaluated to make that determination, correct?

A. No. Just trying to make the determination that it was incorrectly stated on that original paper.

Q. That what was incorrectly stated?

A. That it's 250 subsea instead of a negative 250 subsea.

Q. Now, the next slide here, going back to your slide presentation, same thing with this one, would we -- we'd want to refer instead to your original testimony, the exhibit that correlates to this one in your original testimony; is that correct?

A. Yes. For that far pressure curve to the right.

Q. So that would be Exhibit I-4, correct?

A. Yeah. That's similar to it.

Q. I guess my question is, I'm trying to figure what your final testimony is on this issue. Is it what is stated in Exhibit I-4 or what's stated in this revised Exhibit I-4 on your slide presentation?

A. Yeah, just making sure, I'm just reading the two of them clearly, the key points over to the right and things. But yes, we can go with the original one.

Q. So as you sit here today, your final testimony on this pressure data would be this original testimony, original exhibit in your direct testimony, I-4, correct?

A. Yes, that is correct. And you can see there where on those high zones that you had a thousand pounds of depletion up in Zones 1 and 2.

Q. So in this exhibit, Mr. West, you also include a top of San Andres, correct?

A. Yes.

Q. That's Empire's pick for the top of the San Andres in this well, correct?

A. At the time of this, yes, that is.

Q. Has it changed?

A. I would have to reference. I don't think -- it's just a couple feet if it did change.

Q. So somewhere around, you know, 4,000 measured depth. Measured depth, it's not TBD? Do you

mean TBD?

A. Well, it's referring to the subsea depth there. But, I mean, in a vertical well, TBD and measured depth is virtually the same.

Q. I thought it was referencing the top of the San Andres.

A. Well, it's referencing in this wellbore that --

Q. Okay.

A. -- you know, that measured depth, which would be a safe assumption to assume on a vertical well that, you know, the TBD and measured depth are correct.

Q. Okay. I'm following. Okay. So somewhere around 4,000 feet is Empire's pick for the top of the San Andres. Agree?

A. Yep. Right around 4,000. I mean, it's 3975 here.

Q. But it's no shallower -- or rather, no deeper than that RT pressure measurement at 4,006 feet. Agree?

A. Well, you know, structural position would be depending on where you add on structure. So it would depend on different wellbores.

Q. But, I mean, you're asserting here that this

pressure measurement that you're referencing in this exhibit is in what Empire has identified as the San Andres. Agree?

A. In this wellbore, that is correct.

Q. In this wellbore. So the top of the San Andres in this wellbore is above what you're saying is where this pressure measurement was taken, correct?

A. That is correct.

Q. Right? Okay. It's close, but you're saying the top is picked just above where this pressure was taken, correct?

A. That is correct.

Q. Okay. So yesterday, Mr. West, we discussed this at some length, and I was asking you whether you had done yourself an analysis to determine whether or not this pressure measurement that you're indicating here and that you contend indicates that there's a pressure communication between what Empire has identified as the San Andres and the Grayburg.

I was asking you yesterday whether you had done an analysis to determine whether or not this pressure reading 4,006 feet is in Goodnight Midstream's disposal zone. Do you recall that discussion yesterday?

A. Yes. It is in the San Andres.

Q. That wasn't my question. We went back and forth about this yesterday, right?

A. Yes.

Q. And I was asking you whether you had done analysis. And you were sticking to your guns that this is in the San Andres. And we didn't determine yet where exactly in this well Empire had picked its permeability barrier. Agree?

A. We don't see a permeability barrier?

Q. As far as our discussion, you and I, we did not put up on the screen or have any discussion about where Goodnight had picked its permeability barrier. Do you agree?

A. For Goodnight, yeah, you did not put anything up on the screen, right.

Q. So I do have a cross-section that Goodnight had prepared that shows its permeability pick in the 211. This is prepared by Goodnight Midstream, Mr. Preston McGuire, and at the top left, it shows Empire New Mexico, LLC, EMSU 211 well. It shows on the cross-section, the center well is the Empire EMSU Number 1 SWD well. And then it shows on the far right, Goodnight Midstream's Ryno well, which is one of its disposal wells at issue in this case.

And I'll just scroll down so you can see it. We indicated on the 211, Goodnight indicated on 211 log, the location of Empire's pick, which is right around 390. We said -- sorry. Right around 3,975 feet. Would you agree with me that's approximately around 3,975 feet?

A. Yes. The best that I can see the line, that looks approximately to be the proper location. Can't keep everything in my head.

Q. So you agree with me that that's approximate for Empire's pick for the top of the San Andres in that well. Agree?

A. That's correct.

Q. And then below that, with the black line, is where Goodnight Midstream in this well has picked its top of the San Andres, which correlates to the top of its permeability barrier. Do you see that?

A. I see what they picked. I don't agree with their picks.

Q. Yeah, I'm not asking you to. But this is based on the tops that Goodnight has provided to Empire in discovery, and these are the pics that Empire has identified for this well. I'm not asking you agree with them.

A. Understand.

Q. Also on this image, it goes on to show Empire's San Andres disposal zone within the EMSU SWD Number 1. Do you see that?

A. Yes. That's the disposal zone that just has very small volumes going into it?

Q. Right. That's the disposal zone.

And then to the right, it shows Goodnight Midstream's Ryno well and the depth in the center track here, the depth track, it shows the perforations where Goodnight has perforated its well for disposal. Do you see that?

A. And it looks like they're representing perfs.

Q. And then it has an inset map that shows the location of those wells within the EMSU from A to A prime. Do you see that?

A. Yes, sir.

MR. RANKIN: Mr. Hearing Officer, I move the admission of this as Goodnight Cross Exhibit Number 20.

HEARING OFFICER HARWOOD: It's not already in evidence in your case in chief?

MR. RANKIN: It is not.

HEARING OFFICER HARWOOD: Any objection from Empire?

MS. HARDY: No objection.
HEARING OFFICER HARWOOD: OCD?
MR. MOANDER: No objection.
HEARING OFFICER HARWOOD: Rice?
MR. BECK: No objection.
HEARING OFFICER HARWOOD: Pilot?
MR. SUAZO: No objection.
HEARING OFFICER HARWOOD: It will be be admitted.
(Admitted: Goodnight Midstream Cross Exhibit 20.)
BY MR. RANKIN:
Q. So in this well at least, between where Empire picks its top of San Andres and where Goodnight Midstream picks the top of the San Andres and its permeability barrier, there's approximately -- I'm not going to ask you to confirm, but approximately about 100 feet in this well, correct?
A. Looks like 100, 110 feet difference between the picks.
Q. Okay. In other wells, that difference can be more or less, depending on where you are on the structure and depending on where the picks are. Do you agree?
A. Agree that our picks and your picks don't

line up?

Q. Yes. So for purposes of our discussion today, I'm going to refer to the difference here between Empire's pick and Goodnight's pick, I'm going to call this, just for ease after reference, "The disputed San Andres interval." Okay?

A. The difference between our pick, which is consistent with the state, and what Goodnight is trying to say is the pick?

Q. I appreciate the additional commentary, Mr. West. But yes, I'm asking you just to agree with me that as between where Empire has picked the San Andres and where Goodnight has picked the San Andres in this well, I'm asking you to agree with me -- for the purposes of discussion, I'm going to refer to that as "The disputed San Andres interval." Okay?

A. In this particular wellbore --

Q. In this pick, yes.

A. -- I think sometimes your guys' picks vary up and down.

Q. I'm asking you just for the purposes of this image, this exhibit. Okay?

A. This 110 feet in this well?

Q. Correct.

A. Correct.

Q. Just for purposes of our discussion, is that okay with you, so we can speak the same language?

A. I'll say correct. Sorry about that.

Q. All right. Now, that survey, pressure data survey that we were looking at in your Exhibits I-3 and I-4, that was taken at 4,006 feet, correct?

A. That is correct.

Q. And looking at this log image of the EMSU 211 well, I think these tick marks are 10 feet; isn't that right?

A. Typically, that's right. I can hardly see the tick marks.

Q. I don't think the scale included on this log header -- or we don't even have a log header included. But I believe when you --

A. I can see the middle one, which would be 5, you know, 50, so...

Q. You agree 10 feet, right?

A. Agree 10 feet what?

Q. That each tick mark is a 10-foot interval.

A. Not that I can really read the tick marks. I can read the 50 marks, but it's hard to read them. But we can approximate.

Q. Okay. So, you agree with me that the

4,006-foot depth where the pressure survey data was taken is approximately at this indication where I've got my little blue box?

A. Yes. That would be right in there.

Q. Right in there. And that would be within what Empire calls the San Andres, but above Goodnight Midstream's pick for the top of the San Andres. Agree?

A. What Empire and the State calls the pick, yes.

Q. Okay. Is it your opinion that that location is within Goodnight's disposal zone?

A. If you're calling the San Andres the disposal zone, yes, that would be within it.

Q. No. I guess, Mr. West, just to be clear, looking at the Ryno well on the far right, I'm calling Goodnight's disposal zone the interval below Goodnight's San Andres pick. Do you see that?

A. I see the Ryno well there. But, you know, I don't know what you're defining the disposal zone as.

Q. I'm defining the disposal zone as the interval below Goodnight's San Andres pick, across this cross-section.

A. So firm reference of it is it would be the pick of the San Andres, not whether or not it's a

Goodnight pick or not; is that correct?

Q. I'm sorry. Ask the question again.

A. You would be referring to -- if we're talking with the State, the San Andres is what you're calling the disposal zone?

Q. No. I'm calling the disposal zone Goodnight Midstream's pick below Goodnight Midstream's pick for the San Andres. Do you see that?

A. So you're trying to come up with another spot of the disposal zone rather than calling it the top of the San Andres?

Q. Mr. West, for purposes of discussion, I'm trying to get on the same page. Okay?

A. I'm trying to, too. I'm just trying to understand exactly what you're --

Q. What I'm asking you is -- what I'm telling you is, for purposes of our discussion today, Goodnight Midstream's disposal zone is this interval below what is indicated on this exhibit as Goodnight's pick for the San Andres. Do you see that?

A. Okay. I can see -- yes, I can see where it's perforated in the San Andres.

Q. So what I'm talking about, when I refer to the disposal zone, I'm referring to the interval below this line on this exhibit. Do you see that?

A. Okay.

Q. And is it your opinion that the 4,006-foot mark, where the RFT test was taken for the EMSU 211, is within Goodnight Midstream's disposal zone?

A. I agree that it's within the San Andres.

Q. Okay.

MR. RANKIN: Mr. Hearing Officer, I don't know that I can get him to answer, but I think he's being nonresponsive.

HEARING OFFICER HARWOOD: My problem is, we were talking about -- if you can scroll back up. When we were first talking about the 4,006-foot area -- can you scroll back up?

MR. RANKIN: Oh, the other direction?

HEARING OFFICER HARWOOD: No. Up.

MR. RANKIN: Oh, to the other --

THE HEARING OFFICER: To the same set of wells. We were first talking about EMSU 211, and then you switched over to talking about Ryno 17-1. So I don't think he's being responsive. I think the record at this point is unclear.

BY MR. RANKIN:

Q. Mr. West, I guess I'm asking -- let me try to reframe the question, then. In the EMSU 211, Goodnight Midstream has identified the top of its

San Andres pick. Do you see that?

A. Yes, sir.

Q. And for purposes of my question to you, below that pick in the EMSU 211 is identified as Goodnight's disposal zone. Okay?

MS. HARDY: Well --

MR. RANKIN: For purposes of the question. Okay?

BY MR. RANKIN:

Q. Mr. West, I'm asking you, for purposes of my question, the interval below that pick is what Goodnight refers to as its disposal zone. Okay?

A. Okay.

Q. So are you willing telling me, is it your opinion, that the 4,006-foot depth, where the RFT was taken in the EMSU 211, is within Goodnight's disposal zone?

MS. HARDY: I object to the question as misleading, because I do think it's conflating what's shown here with respect to different wells. The disposal zone Mr. Rankin is asking about is not in the EMSU 211.

HEARING OFFICER HARWOOD: I'm sorry, but I do find the question confusing. And maybe it's nomenclature, and maybe it's just my lack of

technical sophistication. But can you try it again?

MR. RANKIN: Sure.

BY MR. RANKIN:

Q. Mr. West, in this cross-section, Goodnight Midstream has correlated its picks across each of these three wells. Do you agree?

A. I agree.

Q. And based on Goodnight Midstream's analysis, it has correlated its disposal interval across the depths identified in this cross-section. Do you agree?

MS. HARDY: Mr. Examiner, I object to Mr. Rankin testifying about what this exhibit shows Goodnight has done when Goodnight's witnesses haven't testified about it.

HEARING OFFICER HARWOOD: Well, if you want to -- I consider it hypothetical. If you want to rephrase it as a hypothetical --

MR. RANKIN: That's fine.

HEARING OFFICER HARWOOD: -- do it that way.

BY MR. RANKIN:

Q. Mr. West, assuming that Goodnight Midstream has correlated correctly its pick for the San Andres across this cross-section, do you agree with me that Goodnight Midstream has hypothetically correlated its

pick for the San Andres across this cross-section?

A. It has Goodnight's picks across here, but I do not see Empire's picks across.

Q. Very well. But in every instance, would you agree with me that Empire's picks for the San Andres are above Goodnight's picks for the San Andres?

A. I believe from the testimony before, sometimes they're right on top of each other, same spot.

Q. Okay. But they're not below Goodnight's picks for the San Andres, are they?

A. I don't know every pick of it. But do we need to see the frame of reference of where our pick is going across to infer from one well to the left the cross-section to the right? If you draw from my picks or Empire's picks across it, I can't really talk from one well in the cross-section to one to the far right.

Q. I guess I could pull up Mr. Bailey's cross-section. I'm happy to do that, because he's included the cross-section of these wells. Would you like me to do that?

A. Yeah, sure.

MR. RANKIN: Mr. Examiner, will you give me just a moment, like a two-minute break, so I can pull up Mr. Bailey's cross-sections?

HEARING OFFICER HARWOOD: Sure.

CHAIR ROZATOS: Mr. Examiner, we're coming up on the lunch hour. Should we just give him time to be able to just get their thoughts back together and we come back after lunch, we just take a longer lunch?

HEARING OFFICER HARWOOD: Mr. Rankin, would that give you the time you need for all of this?

MR. RANKIN: Probably, Mr. Hearing Officer, I think we could take a lunch break now and come back at 1 o'clock.

HEARING OFFICER HARWOOD: What's your pleasure, Mr. Chairman, for when we return?

CHAIR ROZATOS: Let's return at 1:15. We can break for lunch and we'll come back at 1:15, like we have.

HEARING OFFICER HARWOOD: Thank you all. We'll see you at 1:15.

(Lunch recess was held from
11:39 a.m. to 1:15 p.m.)

HEARING OFFICER HARWOOD: I'll just remind you, Mr. West, you're under oath. And we were in the middle of Mr. Rankin's cross-examination.

BY MR. RANKIN:

Q. Good afternoon, Mr. West.

A. Good afternoon.

Q. When we left, we were talking about your Exhibit N-8 and I-4 in your Slides 12 and 13.

A. Can you show your screen?

Q. Thank you for reminding me.

We were discussing your slide presentations on 12 and 13 which reflect our Exhibit N-8 and I-4. Do you recall that?

A. Yes, sir.

Q. And in addition, we were discussing Goodnight Cross Exhibit Number 20, which is the cross-section that includes the Empire EMSU 211 well, EMSU SWD 17-1 well and Goodnight Midstream's Ryno 17-1 well; do you recall that?

A. Yes, sir.

Q. Okay. And I was asking you about whether or not the RFT pressure survey data that you presented in your exhibits and testimony, which were taken at a measured depth of 4,006 feet within the EMSU 211, were within what Goodnight Midstream defines as its disposal zone; do you recall that?

A. I recall the discussion, yes.

Q. And we were talking about whether the tops generally -- and you told me -- during the course of our discussion you explained that you didn't have --

you couldn't see or didn't know, off the top of your head, where Empire's tops were in the Empire SWD Number 1 well or the Ryno well, correct?

A. That is correct.

Q. Okay. So, just to refresh your recollection, I've got here Mr. Bailey, one of Empire's experts, his cross-section, which is Exhibit K-13 up on the screen. Do you recall this exhibit from Mr. Bailey?

A. Yes, sir.

Q. Okay. And on this cross-section here, Mr. Bailey included his picks for the Ryno SWD Number 1, which is the same well on Goodnight cross-section Cross Exhibit Number 20, correct?

A. Yes, sir.

Q. And then he also has here in the middle well, the EMSU SWD Number 1 well on the same cross-section. Agree?

A. Yes, sir.

Q. And as I recall, and correct me if it's your understanding as well, that on this cross-section, he's got both Empire's picks and Goodnight's picks for the San Andres tops, correct?

A. I believe we want to look at the blue line going across is Goodnight's, and Empire's is in red.

Q. And as to the Ryno well, both Empire and Goodnight have the same top of the San Andres pick, correct?

A. Correct.

Q. But as to the EMSU SWD Number 1 well, Mr. Bailey's pick is several hundred feet above Goodnight's pick, correct?

A. Yes.

Q. Okay. Do you agree with Mr. Bailey's pick for the San Andres in the EMSU Number 1 well?

A. Yes, sir.

Q. Okay. So going back to Goodnight Cross Exhibit Number 20, so as to these three wells on this exhibit, Goodnight and Empire have the same picks for the top of the San Andres in the Ryno well. Agree?

A. Agree.

Q. Okay. But as for the EMSU SWD Number 1 well, which is the middle well in this exhibit, there's a difference of several hundred feet between Empire's picks and Goodnight's picks. Agree?

A. Agree there was a difference. I can't remember the exact distance, but yes.

Q. Okay. As then, as to the EMSU 211 well, there's also a difference of opinion about where that pick should be, correct?

A. Yes, sir.

Q. And as to this, the EMSU 211 well, do you agree with me that that 4,006 feet is above the location that Goodnight has picked for the top of the San Andres in that well?

A. In that well, that is correct.

Q. Okay. And you're not a geologist, right?

A. No, I'm not a geologist.

Q. So you wouldn't be able to tell me, looking at these exhibits, whether the intervals or the picks are correlative across this zone, would you?

A. Not from this presentation. But if you look at the Ops Geologic one, it makes sense whenever you highlight on the Lovington Sand and be able to follow tops across.

Q. I mean, do you generally pick -- do you have the expertise in picking correlative stratigraphic intervals?

A. No, I do not.

Q. Going back to your slide presentation that you presented yesterday, and I'm looking at Slide 13 here, the pressure data reflected in this exhibit does not approximate a straight line, does it?

A. Which pressure data?

Q. Well, thank you. So I'm not talking about

the calculated pressure that you calculated off a pressure gradient here. I'm talking about the RFT data on the left side of this graph.

And actually, perhaps, Mr. West, if you agree with me, we should probably be looking at your original Exhibit I-4, correct?

A. Yes, sir. Same point, but it's got the right subsea depth.

Q. So looking at your Exhibit I-4 from your testimony, the RFT data that you've included on this exhibit does not reflect a straight line, does it?

A. That is correct.

Q. Okay. In fact, over very short vertical intervals, there are large difference in the pressure recorded across that EMSU 211 well, correct?

A. Correct.

Q. And those pressure differentials are larger than can be explained by the pressure from a column of salt water. Agree?

A. It would take in the fact of the formation, yeah.

Q. I'm sorry. Say that again.

A. It would take into fact of the formation.

Q. What would take into the fact of the formation?

A. The different changes in pressure.

Q. I'm not following your answer. Can you explain what you mean?

A. For instance, like, you know, the top two picks, because you say there's Zones 1 and 2, they, you know, have a higher horizontal permeability than they do vertical. There may be some leakage in between them. But as you go down you hit different layers of kind of the baffles that exist in the reservoir. And so you always have a horizontal component of permeability and a vertical also. Most of the time the vertical is slower.

Q. And the pressure difference between these vertical offsets is greater than what would be accounted for in a column of salt water, correct?

A. That is higher than a column of salt water. That is correct.

Q. And what is the pressure gradient that you were using to make the calculation on the pressure gradient on the right side of this chart?

A. That's at .386.

Q. That's what the calculated pressure gradient is?

A. Yes.

Q. Okay. And what is the salinity that you are

using to make that calculation?

A. So that's just taking what that pressure gradient was at that point and going down. If you used a water gradient, then the pressure down at the bottom would be higher. A fresh water gradient is about a .433. So if you want to make -- I mean, at least that's extending that gradient up and down --

Q. Yeah, based off the --

A. I don't know on that column if you want to. We can. I'll make that pressure at the bottom higher.

Q. Got it. No, I just wanted to make sure I understood how you were using it, how you were calculating it.

Okay. Going back to your PowerPoint presentation I'll skip down to Slide 14 here. Then as I understand, this was a pressure survey report for a Grayburg well in the EMSU, correct?

A. Correct. That's one of the injectors.

Q. This is an injection well?

A. Correct.

Q. It's a single well in the Grayburg, correct?

A. That is correct.

Q. And which zone is it injecting into, do you know?

A. I don't know off the top of my head.

Q. Okay. Now, you've identified here one well for establishing a pressure for the Grayburg?

A. At this point in this well, yes, there's one well that we took pressure. And it happened to be down, so I was able to get a pressure.

Q. Are you saying that this one well is representative of the pressure in the Grayburg across the entire EMSU?

A. It representative of the Grayburg in that wellbore. It's 14,000 acres. There's a long ways. You can't make that jump of one.

Q. So you agree with me that this well -- this pressure survey data is representative of a point in time, correct?

A. Yes.

Q. Okay. Next slide here, I think this was -- you used from a Goodnight exhibit in some of the briefing filed in this case, correct?

A. That is correct. And one small correction from yesterday, that Piper Number 2 is actually the missing well that was on here. That's why I couldn't find it. That just between the State Track E well and the Nolan Ryan. That's the reason when I was going over the time line I missed it. I just wanted to make that point.

Q. And the Piper Number 2 is the Penrock well, right?

A. That is correct.

Q. Are you aware that Goodnight Midstream did not own or operate the Penrock well in 2012?

A. Sorry. I might have got the data incorrect, but thought so.

Q. Okay. Now, this slide just shows active saltwater disposal wells, correct?

A. Yeah, this is saltwater disposal wells. That might be the wrong statement if Goodnight began its injection into the well and we didn't know the actual ownership at that time.

Q. The next question I'm asking you, though, is that this exhibit shows only active saltwater disposal wells at this time, correct?

A. This shows all the -- in this area that Goodnight represented, which is around EMSU unit of these SWD wells, I don't know if it has -- are you asking if there's any other inactive ones?

Q. Well, I was just kind of pointing out, I guess it's also missing the Truckers SWD that's in the unit, correct?

A. Yeah. This is your guys' exhibit. Yeah, so you're right, it would be up there.

Q. And the Truckers has been plugged and abandoned, correct?

A. I believe so.

Q. Now, your time line on the right, it excludes or doesn't reference the EME 21 saltwater disposal well which is in the unit. Agree?

A. Is it that one -- where is that?

Q. It's down here in the corner. I think it's that Section 21.

A. Okay. Yeah, we didn't include on the time line of every well.

Q. And was that an inadvertent exclusion on the time line?

A. Yes, trying not to crowd it with everything. It's kind of captured in the cumulative data.

Q. And at the time the map was created, it had injected nearly 40 million barrels. Agree?

A. Is that what it has on there? I can't see that. It looks like it's 39 something. Yeah, 39, I take it for the -- what it says on the exhibit.

Q. Okay. And the first date of injection in that well was in 1966. Agree?

A. Agree.

Q. And you agree it's within -- an injection into the San Andres within the boundaries of the EMSU?

A. Agree.

Q. This next slide is Slide 16 in your presentation. Is there a reason you don't -- again, this Slide 16 is the disposal volumes for Empire's EMSU SWD Number 1 well, correct?

A. That is correct.

Q. And it shows volumes injected from 1995 to essentially present, correct?

A. That is correct.

Q. Is this based on Oil Conservation Division data?

A. Yes.

Q. I think you say so at the bottom of this.

A. Yes. It should have had been at the bottom.

Q. So was this slide prepared based on OCD public data?

A. Yes.

Q. Okay. And is there a reason you don't show disposal volumes for this well prior to 1995?

A. That's whenever it started injection.

Q. Okay. So you're not aware that Chevron converted this well in 1988 to a disposal well?

A. I wasn't aware. My understanding, it was '95 when it was converted.

Q. Apologize. I thought I had this pulled up,

but I restarted my computer. One moment while I pull this up. Apologize for the delay.

Mr. West, I'm showing on the screen the well file for the EMSU SWD Number 1 well, which was previously the Meyer B-4 well. And it shows here in the well file in a sundry notice that was filed by operator Chevron USA, that it was seeking to convert this well, the EMSU SWD Number 1 well, from a -- to be completed as a saltwater disposal well. Do you see that?

A. Yes.

Q. And it was done back in 1988. Do you see that?

A. Yes.

Q. And are you aware that OCD's public data is only available after 1994 for water production and oil production?

A. That's probably why I messed that up. Sorry, I didn't mean to exclude that time frame.

MR. RANKIN: Mr. Examiner, I will move the admission of the single sundry notice into the record as Goodnight Cross Exhibit Number 21.

HEARING OFFICER HARWOOD: Empire?

MS. HARDY: No objection.

HEARING OFFICER HARWOOD: OCD?

MR. MOANDER: No objection.

HEARING OFFICER HARWOOD: Rice?

MR. BECK: No objection.

HEARING OFFICER HARWOOD: Pilot?

MR. SUAZO: No objection.

HEARING OFFICER HARWOOD: It will be admitted.

(Admitted: Goodnight Midstream Cross Exhibit 21.)

BY MR. RANKIN:

Q. Mr. West, is Empire still using this well for disposal?

A. It's not -- I mean, it's an active disposal, but we're not putting volumes into it.

Q. Does Empire intend to maintain it as an active disposal well?

A. No. I mean, we're going to maintain it just to keep it as an active well. But we do not plan to put any disposal volumes down it.

Q. Do you intend to plug and abandon the well?

A. At the proper time, yes.

Q. When would that be?

A. I don't know. Whenever the wellbore is completely deemed -- we're not going to use it. It may be used -- it could be used in the CO2 flood. It

could be used for other different purposes.

Q. What is Empire currently doing with its produced water that it needs to dispose of?

A. Haul it and truck it away.

Q. Where are you trucking it to?

A. I don't know where it's trucked to, off the top of my head.

Q. What are the volumes that Empire is currently trucking?

A. I don't know off the top of my head.

Q. Are you currently sending -- and Empire is no longer sending water to the EME saltwater disposal system operated by Rice?

A. That is correct.

Q. You're the senior VP of operations for Empire and you don't know where the water is going?

A. It's going into non-San Andres reservoirs.

Q. Is it multiple wells you're sending it to, multiple saltwater disposal well operators?

A. I don't know.

Q. Okay.

A. We have wells across multiple states, all over the place. It's hard to...

Q. Okay. Slide 17 here, this is a chart that you explained I think that it shows total disposal

volumes inside the EMSU within a mile, correct?

A. That's correct.

Q. One thing I wasn't clear about, is this a stacked chart or is it overlapping with the data?

A. So it's a stacked chart.

Q. So in order to understand what -- and, again, the orange is Goodnight, correct?

A. That is correct.

Q. And the blue is everybody else within the EMSU within a mile?

A. That is correct.

Q. So in order to understand what Goodnight's injections are, you need to subtract the blue from the orange, correct?

A. That is correct.

Q. And you're only depicting volumes from January 2012 forward, correct?

A. That is correct.

Q. So you are not including any of the early volumes from the EMSU 21 well, correct?

A. Not on this chart. They're included on that cumulative one.

Q. And you're not including any of the earlier volumes from the EME 33 well, correct?

A. I don't know -- you said -- which --

anything before 2012 is not included on this chart.

Q. Okay. This next slide, 18, this is a slide where you prepared showing -- it's a mass balance of water volumes, correct?

A. Correct.

Q. It does not reflect anything regarding pressures in the San Andres. Agree?

A. It give you an indication of if you take water out, there would be less pressure, and if you add water in, there would be more pressure.

Q. But you'd have to understand a lot more about the reservoir to make any inferences about whether there's any implications with respect to the reservoir pressure. Would you agree?

A. You can make inferences that it will go up or go down. You can't predict the exact pressure production from it.

Q. Okay. You mentioned miscibility of CO2 and you discuss this chart. Do you recall that?

A. Yes, sir.

Q. Had you done any studies on miscibility of CO2 in the San Andres?

A. We used an analogous field of Seminole on paper from there and pulled that. Because you do not have core and we don't have individual oil from the

San Andres from this reservoir to do that, you know, exact work. So you use an analogous field.

Q. So you're using the oil properties from the San Andres to make your miscibility calculations for the San Andres ROZ?

A. Correct.

Q. So that assumption of those calculations presumes that the ROZ oil in the San Andres is analogous to the San Andres Seminole unit?

A. Yes. It's saying that it's similar to the Seminole oil, and the San Andres is similar to the oil that's in the EMSU.

Q. Just back to the pressures. Based on the volumes, you can't infer from this chart, based on volumes or mass balance of water, you can't infer sort of magnitude of pressure changes in the San Andres, can you?

A. You can infer direction, but not necessarily magnitude.

Q. Okay.

A. Naturally the higher -- the quicker it goes in or comes out, then, you know, it's probably going to happen more rapidly.

Q. Back to the miscibility question. Your assumptions about -- your calculations about

miscibility of CO2 in the San Andres are dependent upon the assumptions that the Seminole San Andres oil is analogous for purposes of making those calculations, correct?

A. That is correct.

Q. Okay. Let's skip over a couple slides. I'm going to deal with those in your testimony. This is Slide 21 from your presentation.

When you reviewed this slide for the Commission, you were talking about -- you identified two sources of fluid mixed in here, correct?

A. That is correct.

Q. So on the top, you've got Goodnight's treated saltwater disposal water on the top, correct?

A. Well, the disposal water. I don't know about the treated.

Q. These values are provided to you by Goodnight during discovery, correct?

A. That is correct.

Q. And in discovery, was it not identified that these were treated volumes prior to injection?

A. Most of the time people don't treat volumes in an SWD. But if you provided that, I missed it.

Q. So as you sit here, you don't know whether or not Goodnight is treating its volumes prior to

injection?

A. That would be an unusual industry practice.

Q. You didn't review Tom Tomastik's testimony that he filed in the direct cases in this matter?

A. I remember seeing his testimony. I don't remember all of it.

Q. Now, back to my question. This chart shows two sources of fluids mixing. One being Goodnight's water that it's disposing, and then on the bottom, you've got the EMSU produced water, correct?

A. That is correct.

Q. And the produced water would be Grayburg water that is being produced from Empire's production wells in the EMSU, correct?

A. It would be the injection water, which is made up of a lot of traditional San Andres water.

Q. Hold on. On the left side here it says, "produced water." Agree?

A. Produced water goes back in as injected water.

Q. So it's water that's being produced by Empire's production wells. Agree?

A. That is correct.

Q. And that would be Grayburg water. Agree?

A. It would be the mixture from the waterflood

and all the water wells. You drew, you know, many, many barrels out of the San Andres and replaced it in the Grayburg. So it's a mix of those two reservoirs.

Q. And then wouldn't you agree there's a third source of fluid, for purposes of mixing model between these two sources of water?

A. What's the third source?

Q. Wouldn't it be the San Andres?

A. Yeah, there would be some that would probably be pushed from the SWD wells that could mix in there.

Q. Mr. West, is Goodnight injecting into the Grayburg?

A. Since they're in communication, you know, between the San Andres and the Grayburg, the fluids mix.

Q. Let me ask the question again. Is Goodnight injecting into the Grayburg? Are there perforations that Goodnight is injecting -- are they in the Grayburg or are they in what you call the San Andres?

A. There is not in the Grayburg. No perforations in the Grayburg.

Q. So is Goodnight injecting into the Grayburg or the San Andres?

A. They are injecting into the San Andres.

Q. Thank you. So Goodnight's water is being injected into the San Andres, but you're not accounting for any mixing or dilution of San Andres volumes in this depiction on your exhibit, are you?

A. They kind of get, you know, mixed up in the EMSU produced water.

Q. Let me ask again. You're not accounting for any dilution from San Andres water in this exhibit, are you?

A. There's a lot of dilution that goes on in all the mixing. I mean, it's many millions of barrels.

Q. And this exhibit does not account for that dilution, does it?

A. It's not trying to. It's just stating this is the one fluid type here and this is the other fluid type.

Q. And in the middle between the two, you've got this little indication that seems to imply that those two fluids are directly mixing.

A. Because they mix through the -- whether it's through the fractures of the reservoir that communicate the two or through wellbores or through the water supply well that pulls directly out of the San Andres and injects water into the Grayburg.

There's mixing going on.

Q. And there's a third source of water that you don't include in this chart, and that's the San Andres. Agree?

A. San Andres is very similar to the Grayburg. It's kind of one and the same now.

Q. Now, looking at this chart and looking at the anion inside, you've got hydrogen sulfide, right?

A. That is correct.

Q. And I see the numbers are arranged in the Grayburg from, I don't know, 200s up to 800. Agree?

A. I agree.

Q. That's parts per million?

A. That is milligrams per liter.

Q. Which is parts per million, right?

A. Yes.

Q. So is there anything more corrosive on this chart than hydrogen sulfide? And I'm talking about corrosion.

A. You're talking about corrosion?

Q. Yeah. Is there anything more corrosive than hydrogen sulfide on this chart?

A. There's a lot of things that go into the chemistry. If you get chlorides to go up in things, it'll cause corrosion or will affect the chemistry to

make corrosion happen faster. So it's not just, you know, any straight element. But in general, you know, H2S is a corrosive element.

Q. Is it your opinion that chlorides are more corrosive than H2S?

A. It depends on the complete environment that they're in. I mean, chlorides have an effect, pH has an affect. You know, H2S has an effect. The CO2 has an effect.

Q. Is CO2 also corrosive?

A. Yes.

Q. Looking at Slide 23, are you aware that the Ryno well operated by Goodnight Midstream was originally permitted to inject into the Devonian?

A. Yes.

Q. Did you forget that it was originally approved to inject into the Devonian in 2017 when you made your statements about this slide?

A. I think I said 2019 or 2020, but I don't know.

Q. So from 2017 to the time this workover report was prepared, that's about seven years. Agree?

A. There would have been a workover -- if you went from the Devonian up to the San Andres, you would have had another workover in between here.

Q. So you're saying that the tubing is different for the San Andres disposal?

A. Would have said that you would have pulled it out and inspected it properly before you ran it back into the San Andres.

Q. These slides, from Slide 25 to 29, my understanding is the intent here is to show based on certain assumptions that you made that there's an area being impacted by Goodnight's injection within the EMSU. Correct?

A. That is correct.

Q. And the assumptions are based on a certain value or ratio of net to gross in the injection wells, correct?

A. That is correct.

Q. Okay. What are some of the other assumptions that you made in order to make this representation?

A. It's a perfed interval, it's a 50 percent net to gross. And that, you know, your water that you're injecting is going to push whatever is existing in the reservoir out.

Q. So the last assumption you mentioned, the area that -- the bottom of the water injected, is that an equal volume of water that's being pushed out?

A. Barrel for barrel.

Q. So does that essentially double the affected area that you've calculated based on those assumptions?

A. No, you're having an effect. So when you put a barrel in, you got to effectively, you know, go in or go up?

Q. The question is, is it doubling the area that you're representing as being affected by the disposal?

A. So the effect is whatever total fluid that's being pushed.

Q. Mr. West, that's not a hard question, I guess. So you're saying it's an equal barrel from the injection to the barrel affected. So it's twice the number of barrels, right, that you're assuming are affecting the EMSU, right?

A. Yes. The affected area is the barrels going in, and the barrels it affects in pushing the reservoir. Total-wise, yes, it doubles that.

Q. It doubles the size of the area?

A. The area impact.

Q. Okay. And what is the effect?

A. Mixing of fluids, the chemistry that we went on earlier. It's, you know, re-pressuring the

reservoir.

Q. And is it your opinion -- I mean, my understanding from Empire's case is that the ROZ oil in the San Andres is not movable, except for the injection of CO2. Would you agree?

A. Yes.

Q. Okay. Slide 31 in your presentation here this is a representation of Empire's water management system across the EMSU and EMSU-B; is that right?

A. Yes. The pipeline and facilities.

Q. And I'm talking about I guess specifically referring to the pipelines here. This system was set up and designed in part to move water across these two units, right?

A. Yes. They operate from one system.

Q. Okay. And it's moving injected -- let me see how to phrase this exactly. So it's moving the water supply well water out to all these wells for reinjection to manage the waterflood. Agree?

A. Correct. It comes into where you see there that EMSU CTB. All the fluid comes in through there and then is redistributed out through that system.

Q. So at the time the waterflood was set up, there were six original water supply wells. Agree?

A. Agree.

Q. And this system was employed to move the water produced from those water supply wells in the San Andres for purposes of waterflooding across all this acreage. Agree?

A. Agree.

Q. And at the time are -- let me get to my paper that I don't have up yet.

This is Goodnight Exhibit B-5. This is the Chevron corrosion paper that we previously discussed. In addition to the other matters we discussed about this exhibit, Chevron stated in this paper that, and I'll quote here, it's Page 3 of this document, "The San Andres Formation provides the only source of water formation is the geographic area with a sufficient volume of water for the waterflood and unfortunately had to be used as supply source knowing that the San Andres water was not compatible with the Penrose and Grayburg formation waters." Did I read that correctly?

A. Yes. That was your business decision.

Q. And this system that you show in your PowerPoint here in Slide 31 distributed all this non-compatible water across these two units for injection into the Grayburg. Agree?

A. Agree.

Q. And it was doing that since 1987. Agree?
A. That is correct.
Q. On these conclusions, on Slide 32, you state that the EMSU has a ROZ of over 900 million barrels of oil, correct?
A. Correct.
Q. Just so I know, because there's lots of different sources here, what is that 900 million barrels based on?
A. It's based on looking at all the different points of data. It's stuff that goes up over 1,000 -- million barrels into the range, and that 900, so decent representation --
Q. Okay.
A. -- of the EMSU.
Q. And then on Point Number 2, you state at that, "The San Andres reservoir pressure is increasing and this is promoting increased water influx into Grayburg intervals." Did I read that right?
A. Yes, you did.
Q. I was trying to find where in your overview slide presentation you made any demonstration of increase in San Andres reservoir pressure. Can you point me to a slide where you made that?
A. By nature of where we talked before, in the

slide, we withdrew a lot of water out of the San Andres, and now it's filling back up. So by nature, if you're filling back up the reservoir with SWD, you're raising the pressure.

Q. And is that based on this mass balance slide that you showed me that we were talking about?

A. Yes, sir.

Q. And, again, you can't say anything about the magnitudes of pressure?

A. I cannot say anything about the magnitude. It's going up and the faster you inject in it, the faster it's going to fill up.

Q. Okay. We talked about this a fair bit in reference to your summary presentation. And I confirmed with you that this is your rebuttal Exhibit N, and this is on Page 7 of your rebuttal testimony where you talk about your calculations with respect to pressure in the San Andres. Do you recall this testimony of yours?

A. Yes, sir.

Q. Okay. And Dr. Buchwalter relied on this data for his model, correct?

A. Yes, sir.

Q. Now, I want to bring up another slide. One moment.

MS. HARDY: Mr. Rankin, what page are you showing there?

MR. RANKIN: This is Page 7 of his testimony, on Exhibit N.

BY MR. RANKIN:

Q. This is Goodnight Exhibit B-47. And this was part of Mr. McGuire's rebuttal testimony. Do you recall, did you review this testimony, Mr. West, as part of Mr. McGuire's rebuttal testimony?

A. I remember seeing the exhibit.

Q. Do you see this well up here in Section 20 of Township 20 South, 37 East?

A. Yes, I see the highlighted well.

Q. And it says the date of first injection was July 1959. Do you see that?

A. Yes, I see the date there.

Q. And it's got a cumulative injection volume of over 14 million barrels. Do you see that?

A. Just to clarify, that's an -- I'm trying to read the symbol. That's an injection well?

Q. Correct. It's a saltwater disposal well that's operated by Rice in Section 20, Township 20 South, Range 37 East. Do you see that?

A. Yes, sir.

Q. Okay. And that's about a mile and a half,

would you agree with me, directly north of the EMSU?

A. That's about right.

Q. And so that's just, you know, a short distance outside -- would you agree with me that there's no primary production immediately offsetting this saltwater disposal well?

A. You don't have the wells on there, so I have no idea to tell.

Q. So you're not aware yourself whether there's primary production offsetting that well?

A. I can't tell from this exhibit.

Q. That's fine. Mr. West, we were provided shortly before the start of this hearing, at the end of February, this document from Rice Operating, and it's a Bottom Hole Pressure Survey Report for that well I showed you on the map. It's the Rice Engineering & Operating well, the EME H-20 well. We provided this to Empire counsel shortly after we received it from Rice. Did you have a chance to see this?

A. Yes, I've seen it.

Q. And the EME is part of the injection system saltwater disposal injection system that Empire was a part of. Agree?

A. I'll take your word for it. I don't

remember which wells they are.

Q. This is a Bottom Hole Pressure Survey Report that's dated July 15, 1959. Do you see that? I've highlighted it here.

A. Yes, July 15, '59.

Q. And similar to the Bottom Hole Pressure Survey Report that you included in your outline, your summary outline, this is a Bottom Hole Pressure Survey Report for this well. Do you see that?

A. Yes, sir.

Q. And it shows a measured bottom hole pressure about a mile and a half north of the unit. And if I scroll down, you can see that the lowermost bottom hole pressure here was measured at a depth of 5,000 feet at 1800 psi. Do you see that?

A. Yes, sir.

Q. Okay. And this well, at the time of the pressure survey, was an open hole completion. This is a document from the OCD's website showing the completion configuration for this well. It's dated April 27, 1976. And it indicates that it's the wellbore configuration for the EME H-20 well. Do you see that?

A. Yes. And this is representative of 1976. I don't know what it was '59, necessarily.

Q. Okay. And it identifies the location of the well that we discussed that's in Section 20, Township 20 South, Range 37 East. Do you see that?

A. Yeah, I see the label description.

Q. Do you agree that's the well in the same section that you and I were discussing on Goodnight's Exhibit B-47?

A. I'll take your word for it. I don't have the map in front of me with the section township ranges. But if you say so.

Q. Going back to the bottom hole survey, this survey report shows that -- before I do that, I'll jump back over to your Exhibit I.

So you're saying here in your Exhibit I-4 that the San Andres Formation pressure is at 1245 psi -- I'm sorry -- 1527 psi as the original reservoir pressure; is that correct?

A. Yes, for that depth.

Q. For that depth? Okay.

So when I go back to the Rice H-20 pressure survey report, at 5,000 feet, that's roughly 1,000 feet deeper. Agree?

A. That is 1,000 foot deeper.

Q. And at 1,000 feet deeper, it's roughly about 53 psi higher than what you're calculating for the

San Andres. Agree?

A. Can we do some math to convert that 1800 to 5,000 to a gradient, so we know what gradient that is?

Q. Sure. So, you and I did this during your deposition and I learned some engineering from you. But basically, we'll take the 1800 feet, right?

A. Divided by 5,000.

Q. And divide by 5,000. That comes up to .36 psi?

A. So we have an original .38.

Q. Yeah, and I'm happy to do it, so we can --

A. That's what it is. I can't do that math in my head.

Q. We can do that. I'm happy to do it. So 1800, right?

A. Yep, 1800 --

Q. Divided by 5,000 gives was a .36 psi per foot gradient, correct?

A. Pretty similar pressures. That's good confirmation.

Q. Okay.

A. Original.

MR. RANKIN: Well, before I get too far along, Mr. Hearing Officer, I guess I might as well do this now, I'll move the admission of this Rice

H-20 pressure survey report as Goodnight Cross Exhibit 22?

HEARING OFFICER HARWOOD: Objection from Empire?

MS. HARDY: No objection.

HEARING OFFICER HARWOOD: OCD?

MR. MOANDER: No objection.

HEARING OFFICER HARWOOD: Rice?

MR. BECK: No objection.

HEARING OFFICER HARWOOD: And Pilot?

MR. SUAZO: No objection.

HEARING OFFICER HARWOOD: It'll be admitted.

(Admitted: Goodnight Midstream Cross Exhibit 22.)

MR. RANKIN: Mr. Examiner, I'd move also the admission of this well configuration, and it also has a plat on the next page showing the location of the well, which I neglected to point out. And I'd like to move this as Goodnight Cross Exhibit Number 23.

HEARING OFFICER HARWOOD: Empire?

MS. HARDY: No objection.

HEARING OFFICER HARWOOD: OCD?

MR. MOANDER: No objection.

HEARING OFFICER HARWOOD: Rice?

MR. BECK: No objection.

HEARING OFFICER HARWOOD: Pilot?

MR. SUAZO: No objection.

HEARING OFFICER HARWOOD: It'll be admitted.

(Admitted: Goodnight Midstream Cross Exhibit 23.)

BY MR. RANKIN:

Q. So, Mr. West, I've now pulled up Goodnight's Exhibit B-21, which is a calculation of the pressure gradients for each of Goodnight's active saltwater disposal wells. Do you recall reviewing this exhibit as part of Mr. McGuire's direct testimony?

A. Yes. I believe I've seen it before.

Q. On it he shows, from left to right, each of the wells that Goodnight operates, the fluid-level date that the data was taken, the shut-in tubing pressure recorded for each of those wells, and the fluid level measured from the surface.

Then he also has the measured depth of the top perf, the mid perf and the base perf going from left to right. And then he has the bottom hole pressure at the mid perf calculated for each of these wells. Do you see that?

A. I see that. And it looks like you're using a .465 saltwater gradient.

Q. Mr. McGuire used a .465 based on an estimate

of what the TDS content is of the San Andres.

Now, he's also calculated for each of these wells a pressure gradient, just as you and I had done, for the H-20. Agree?

A. Yeah. I don't know how -- I assume that's what he did, did the math right.

Q. Then he came up with an average gradient for each of these wells down here, which was a .38 as an average gradient. Agree?

A. Agree.

Q. And these were all calculated in 2024. Agree?

A. Yeah, I see the dates. Yes.

Q. So we go back to the H-20 well and we calculated a .36 pressure gradient. It shows there's been only a slight increase -- well, let me ask you this. When I go back to Exhibit B-21, it gives us mid perf depths, and it's ranges anywhere from about 4300 feet to a little more than 5200 feet. Do you see that?

A. Yes, sir.

Q. Okay. So would you agree with me that that's within the range of the depths at which this Rice EME H-20 well was measured?

A. Yes.

Q. And when I go back and consider what the pressure gradient is that you and I calculated here for the H-20 well, is .36, and I consider that in 2024, Mr. McGuire calculated at .381 pressure gradient, doesn't that represent only a slight increase in pressure gradient since 1959?

A. So flip to cumulative material balance on my presentation, the volume of water in and out.

Q. How does that impact this consideration?

A. Because it shows that you're almost filled back up. And so your pressure, you would expect your pressure to be about the same. You took out a whole lot of volume and you've almost filled it back up to its original pressure, because you took off hundreds of millions of barrels out of the reservoir. Now you've put hundreds of millions of barrels back.

And you can imply from that chart that you're -- it looks like you're getting close to that balance line. So you're just telling me, yeah, it looks like maybe it filled up a little faster than that.

Q. But let me ask you this, Mr. West. When we hear from Dr. Buchwalter about how much pressure is increasing per million barrels of water since 1959, hundreds of millions of barrels of water have been

injected into the San Andres. Would you agree?

A. There's been hundreds of millions out and there's been hundreds of millions in.

Q. Right. So just considering the volumes that were put back in, so hundreds of millions of barrels put back in and the pressure gradient has only increased approximately, what, two-tenths -- two-hundredths of a psi per foot?

A. Bring up the exhibit so everyone can see the cum volumes in and out so we know what we're talking about. The other one.

Q. Yeah, the PowerPoint.

A. Right here. So you see, so your pressure point is around 59, 60, let's call it the same. You put some in, you took a bunch out, now you're putting it back in. You know, present day, you're almost saying that you filled it back up. So I would expect present-day pressure to be really close to what it was in 1959.

Q. Well, and that's -- I understand your position there. And I'm asking you now, with respect to Dr. Buchwalter's testimony, that for every million barrels of water, you're seeing a .4 out of 10 psi increase. How odes that square with Dr. Buchwalter's testimony?

MS. HARDY: I object to Mr. Rankin testifying about what Dr. Buchwalter testified about. I mean, it's not this witness' testimony.

HEARING OFFICER HARWOOD: Maybe ask him if he remembers what Dr. Buchwalter said on the subject.

BY MR. RANKIN:

Q. Mr. West, do you recall Dr. Buchwalter's testimony about the effect of injection in the San Andres with respect to pressure increases?

A. I can't say that I recall all of it. It's been a few days.

Q. Okay.

A. I'll let his testimony speak for itself.

Q. Do you recall Dr. Buchwalter testifying that for every million barrels of water injected into the San Andres, the pressure would increase anywhere from 4 to 10 psi?

A. I don't recall what reference of time he was talking about.

Q. Well, it was with respect to volumes, right? He said for every million barrels injected, there would be a corresponding increase of anywhere from 4 to 10 psi. Do you recall that testimony?

A. I don't recall that testimony.

Q. Okay.

A. There's been a lot of testimony.

Q. Sure. But that seems to be a fairly important piece of evidence for Empire. You don't recall his testimony on that point?

MS. HARDY: Asked and answered. Objection.

MR. RANKIN: That's fine. I'll move on.

HEARING OFFICER HARWOOD: Thank you. Sustained.

BY MR. RANKIN:

Q. If that were the case Mr. West, if Dr. Buchwalter had testified that for every million barrels of water, the formation pressure in the San Andres would increase from 4 to 10 psi, would that consistent with this data that we just discussed?

A. I don't know.

Q. Okay. Going back to your rebuttal testimony, you state here -- and this is on Page 6 of your rebuttal testimony in Exhibit N. You state that, "The Grayburg has much lower permeability than the San Andres in most layers, therefore mud losses while drilling usually do not occur until drilling reaches the San Andres high permeability intervals." Did I state that correctly?

A. That's the statement. Can you just scroll up so I can see what's above? I'm trying to figure

out what context it was put in.

Okay. You can scroll down.

So yeah, it would be referenced in probably the lower section of the Grayburg.

Q. Okay. So my understanding about what you're saying here is, because the Grayburg generally has low permeability, or has lower permeability than the San Andres, that if you're drilling through the Grayburg, you wouldn't usually have drilling losses until you've reach the San Andres. Is that my understanding of that statement?

A. Not necessarily. You know, drilling losses will occur whenever you have a possibility of a zone taking a drink or whatever. And it could happen up high in the Grayburg. You know, Zones 1 and 2 is low, so it could -- they're inconsistent of where you're going to get drilling losses.

Q. So I'm trying to understand what exactly you're saying here. Are you saying that the Grayburg -- I thought I understood you to say, my impression of this, is that the Grayburg has lower permeability than the San Andres in most layers. Right? Correct?

A. Yes, that's what the statement says.

Q. Therefore, you say mud losses while drilling

usually won't occur in the Grayburg, correct?

A. That is correct.

Q. And my understanding is that the rationale that you're presenting to us is that those drilling loses won't occur because the Grayburg has much lower permeability. Agree?

A. There's a varying of permeability through all of them.

Q. But you won't expect to have losses in the Grayburg because of that low permeability. Agree?

A. Where the permeability is lower, I wouldn't expect to have this matter of drilling losses.

Q. Okay. I may come back to this if I have time, Mr. West, but I can't find the exhibit I wanted to use so I'll move on from it now. I may come back to this based on timing.

A. Okay.

Q. This is Page 4 of your rebuttal testimony, Exhibit N. And I'm happy to show you the context here. But I wanted to focus on this bullet point, where you state that: If we correct the oil saturations down on the core -- and I believe you're referring to the EMSU 679 core; is that correct?

A. Yes.

Q. Okay. -- then the interval with oil

saturation greater than 20 percent extends down to the near the bottom of the core at 4,357 measured depth or minus 757 feet subsea, resulting in a 215-foot oil column in the San Andres EMSU 679 and 450 feet oil column in the EMSU 278. Did I read that correctly?

A. Yeah. That's just -- also, that's how longer the cores are.

Q. Right. So the core is limited by the depth of the core?

A. Correct, yeah. The thicknesses.

Q. So I want to ask you about the correction you applied here. What is the correction that you suggest here based on?

A. Can you scroll up a little bit just to make sure I've got all my context right?

Q. Sure.

A. So it's a correction of whenever you lose -- you do conventional coring, that there's, you know, fluids lost out of the core, you know, oil and gas that comes out just naturally by the depressurization of the core. So you can put back in some volumes of oil in there because the -- the gas is going to be in the solution of the oil, and preferentially, it's going to push the oil out. It might push some water out, too. But the oil is definitely to expand as it

depressurizes from, where he's looking at, roughly 13-, 1500 psi and comes all the way to the surface at zero.

Q. Have you done any analyses of the San Andres oil to justify this correction that you suggest here?

A. Ask the question again.

Q. Have you done any analyses of the San Andres oil in the EMSU to justify that proposed correction?

A. No. We don't have a good sample of oil in the San Andres, so you just have to make engineering assumptions.

Q. Is it based on literature or is it just based on your engineering assumptions?

A. It's, you know, literature that all the Seminole cores that they took, where they took cores that were pressure corers, they took sponge cores and then bump them back in. There's been a lot of testimony on that earlier.

Q. Okay. And so did you, yourself, undertake that work, or are you relying on Empire's other experts to make the determination about whether the SSAU is analogous for purposes of determining a proper correction?

A. Depending on the experts, depending on the paper, make a good engineering judgment saying that's

reasonable.

Q. This is your opinion or are you relying on your experts for those correction values?

A. Them and then, you know, my interpretation of the paper and interpretation of their data and, you know, saying this is reasonable.

Q. So it's your own opinion. Agree?

A. Yes.

Q. Okay. And then I think I heard you say you haven't don't have -- you haven't done -- what have you done, if anything, to determine what the oil characteristics of the ROZ in the San Andres would be? Have you done anything to try to evaluate what the oil characteristics would be in the San Andres?

A. To be on this, you would have to, you know, get core, get a true sample of oil and which -- since it's in the ROZ, it would have to be from core. You'd have to extract it to do an analysis on the exact oil in the San Andres and the EMSU. We do not at this point in time have that sample.

Q. Right. So failing that, there's nothing else you can think of or no other efforts you can undertake to determine what might be a reasonable determination of oil characteristics for the San Andres ROZ?

A. So what you do reasonable is you look to see where there's literature or fields that are similar, and then you use that literature and your experts to derive what you would use in this field because you have a lack of data of the actual oil from the San Andres. Which we wish we always had all the data, but you never have complete data.

Q. Next bullet I want to talk to you about is here at the bottom of your Page 7, where you get into the chemistry issues that you discuss in your summary slides. And here you refer to some data that's in Exhibit N-9. And I'll go ahead and pull up that exhibit.

This is your Exhibit N-9. Is this the exhibit that you're referring to in that testimony I had highlighted previously?

A. Yes, sir.

Q. And just to be clear, the data here is all from 2024, correct?

A. Yes.

Q. And Goodnight has been injecting into the San Andres in the EMSU for several years by the time these samples were collected in 2024. Agree?

A. Agree.

Q. Correct, right?

A. Yes, right.

Q. But, actually, there are more chemistry samples collected for each of these wells than what you show on your exhibit. Agree?

A. Yes.

Q. Mr. West, I'm sharing on my screen here a copy of that Exhibit B-42, which is in Mr. McGuire's rebuttal testimony. And I've highlighted here each of the wells that were identified on your Exhibit N-9. And I'm going to do my best to flip between your exhibit and these values to just identify what we're looking at.

I'm going to start from left to right on your Exhibit N-9. We'll start with the EMSU 377 well, and that's the data chemistry in green, correct?

A. Yes.

Q. And you've got two data points for that well --

A. Yes.

Q. -- that you show on your exhibit?

And on Mr. McGuire's, there's four data points, correct?

A. Yes.

Q. And starting in May of 2023, the chlorides are 11,900 ppm approximately, correct?

A. Yes.

Q. And it actually shows that they go down over several months before they tick back up again in November of 2024. Agree?

A. Agree.

Q. And in your exhibit, however, you just show those two data points showing that it's only going up. Agree?

A. Agree. But that would go, like, to the circles that we were talking earlier. You're injecting in volume, and then you're pushing volumes of San Andres water. So you have to wait until they actually get water that's being reinjected into the well as SWD.

So earlier data is kind of -- it could drop down or, you know, have a change of whatever, because you're getting that connate San Andres water that was there that's being pushed into the well. So you look at trends over a small period and you continue to monitor them to see if it goes up. So there's a point you got to, you know, start at a starting point and look.

Q. Earlier data is irrelevant?

A. If the injected volumes haven't reached that wellbore, it's irrelevant.

Q. So if there were higher values in the EMSU those would be irrelevant for chlorides?

A. So you would go to where those injection circles are. You'd have to have the fluid that's impacted in there and you'd have to actually reach these wells.

Q. So looking at the next well, you've got the EMSU 407 and you've got three data points here, correct?

A. Yes, sir.

Q. And when I look at Mr. McGuire's Exhibit B-42, he's got four database. So one was excluded, correct?

A. Yes.

Q. And you excluded the September 23 data point. Agree?

A. All my data was in '24, so I didn't include anything in '23.

Q. The '23 data would have included the time frame during which Goodnight's wells were injecting. Agree?

A. Injecting, but you made -- that fluid may not have reached those wellbores yet.

Q. It goes from 13.9 parts per million down to 11.6 parts per million during the period in which

Goodnight was injecting. Agree?

A. Yes.

Q. And the same thing with these other points, Mr. West. You excluded data points that show a potential increase and decrease, a variation in these chloride values across each of these wells.

A. You made a statement. Was there a question?

Q. That's the question.

A. Okay. Sorry about that. Can you ask me the question?

Q. Sure. With respect to the wells I've just identified, you've excluded data points that show a variation from high to low and sometimes back up again for each of the wells I've just identified, correct?

A. Correct. So in production engineering, you're doing trends, to see if it's impacting. And you've got to -- like I said, the injected fluid in from the SWD has to reach the wells before the data is relevant.

Q. And you also excluded in your presentation any indication of what the sulfate concentrations are, correct?

A. Yeah. This is the chlorides.

Q. Wasn't it one of Empire's main contentions from Dr. Lindsay and yourself that sulfate is an

indication of the presence of San Andres water?

A. Yes, originally.

Q. What do you mean by "originally"?

A. Over time, you know, a lot of the sulfates dropped out with the barium and whatnot and reacted with other chemicals. And so, you know, you can still get little pockets of sulfate coming in and out, but that would be where you're pushing new barrels.

So if you did get some sulfate increases in here, that could be another indication, I guess, that you're pushing San Andres virgin water toward those wellbores. And then that water is getting into these wellbores and coming up.

Q. For example, in the EMSU 47, you're seeing sulfate. In September 2023, you're going from 600 parts per million down to 460 parts per million. Agree?

A. Yeah. So that could be a case to where you're pushing San Andres water with higher sulfate and then you're starting to get into water which is less sulfate rich, the Goodnight water, and the chloride, you know, where it swaths around.

Q. And so your opinion is that anything here could be an indication of San Andres water encroaching upon your wells. Is that a fair statement?

A. You try to look for trends and you look at different pieces. I mean, there's a lot of dilution going on, so it's tough.

Q. Are any of these values a fingerprint that you can confirm as actually San Andres water from Goodnight's injection?

A. Well, it wouldn't be San Andres water; it would be water from the Delaware Basin disposal water getting there. There's good indication -- you're seeing indications of increases in chlorides.

Q. When I look at your Exhibit I-11 and I-12, in your direct testimony, you presented historical values for historical water analysis data the Eunice Monument South unitized interval. And there's two pages of data that you represent as being historical water values, chemistry values, correct?

A. Yes, sir.

Q. And then you've got a column here for chlorides, and I think you actually -- I think these are ranked from lowest to highest on a TDS basis; is that right?

A. That's what it looks like. I don't recall exactly what it is.

Q. So I think it's lowest to highest on a TDS basis. But the chloride concentrations closely track

that, correct?

A. That is correct.

Q. So we go from about 2200 parts per million chlorides all the way up to on the high end, over 32,000 parts per million chlorides in the EMSU, correct?

A. Yes, sir.

Q. And when I look at your PowerPoint presentation, where you show us the network of water distribution and injection into the EMSU, all this water is getting mixed across the entire two units, correct?

A. That is correct.

Q. So I ask you, I guess, Mr. West, when I look at your Exhibit N-9, how is it possible where the highest chlorides that you reported here are still under 15 parts per million, this can in any way be indicative of a fingerprinting of disposal water from Goodnight Midstream into the San Andres?

A. It's an indication of the chlorides that are raising from higher chloride fluid.

Q. Okay. And couldn't that easily be a consequence of the distribution of chloride values in other parts of this unit that you've indicated as being historically high across the Grayburg?

A. It could be. I mean, there's mixing of it all. It could be also where you're, you know, pulling in the water supply well, water that's maybe coming in and mixing higher. Or it could be pushing some connate.

But to have in a little finite area that you're seeing consistent across all those wells chlorides coming up, it's an indication.

Q. Looking at Exhibit I-18, Mr. West, this is an exhibit that you refer to in your testimony where you state that, as you do here on the slide, that there are -- there's a 13.4 percent decline in the EMSU production these nine months that you presented on this chart. Agree?

A. Agree.

Q. And as I said, what you did was you took the barrels per day produced in November 2023 and you compared it to the barrels produced in July 2024 and you calculated percentage change between those two values, correct?

A. That is correct.

Q. How did you come to choose those nine months -- actually, you didn't even use nine months in your analysis. You just used two months. Agree?

A. We used a whole column. This was due on

August of '24, so that's the reason we truncated the data there.

Q. But in your calculation, you just used two points to make that calculation. You used November 2023 and you used July 2024. Agree?

A. Agree.

Q. How did you come to decide to use those two months, November 2023 and July 2024, to calculate your 13.4 percent decline?

A. That's what you do with a decline, you do this first point, you do the last point.

Q. Is that an engineering analysis?

A. That's how you do a decline rate, you know, rise over run.

Q. How did you come to choose November 2023 and July 2024?

A. I don't remember exactly November of 2023. July of 2024 is easy. The document was due in July of 2024.

Q. What was due?

A. Wasn't this document due in August of 2024?

Q. I guess I'm asking, what is this document? What is this taken from?

A. This is taken from my testimony, right?

Q. Okay. So you're saying with this document,

you used that date because it was -- you used that July 2024 date because it was the most recent date available for production? Is that what you're trying to say?

A. Yes, sir.

Q. I didn't mean to testify for you. How did you come to choose the November 2023 date, then, as the initial date for your calculation?

A. Just went back a time period and picked that.

Q. So if I pull up Mr. McGuire's rebuttal Exhibit B-40, which includes a longer view of production around those months, he's identified here in brackets on the second page of that exhibit the months that you've identified in that chart. Do you see that?

A. Yes, sir.

Q. And he identified in the brackets from November 2023 to I believe it was August 2024, correct?

A. July of 2024, because that was the last piece of data I had. This is seeing into the future.

Q. Right. So my question to you was, why did you choose November 2023? If you had chosen, say, August 2023, it would have shown almost no decline

between those months. Agree?

A. Looks like there's a break in data.

Q. There's a break in data, Mr. West, I'll represent to you, because we didn't receive these two months from Empire. We asked for the daily production rates and we didn't receive them, so that's why there's break in the data there.

A. Okay.

Q. Just pointing out, Mr. West, if you had chosen August 2023 and compared it to July 2024 or even, let me pick another date, for example, June 2023, if it was a June 2023 date, I think that's the date here, and I compared it to July 2024, there would be a much smaller decline, wouldn't there have been?

A. I could pick, you know, December of '22 and there would be more of a decline.

Q. I guess my point is, how did you end up choosing -- is it reasonable to choose any month out of the year? Why not do a more reasonable or a longer term assessment of what the decline is, if any? How did you come to choose that month?

A. Just looking at a more recent time frame and, again, just a trend.

Q. But if I had chosen July '23 and compared it to July '24, a 12-month trend, it wouldn't have shown

as much of a decline, would it have?

A. It still would have been a decline.

Q. Looking at this period of production, Mr. West, Goodnight started injecting into the EMSU in roughly 2020; is that correct?

A. Sounds about right.

Q. And Empire acquired the unit around March of 2021, agree?

A. Yes, sir.

Q. And that steep decline around the time of Empire's acquisition is related to the transition in operations; is that correct?

A. No. That was DCP had to -- during the process, when it was selling, had a pipeline shut down. So it was down for three, four months.

Q. So it was an operational issue, not related to the transition, but related to some outside issue?

A. No. It was actually down when the data room was out.

Q. Okay.

A. So it was down there and then all the way into '21. So that's your deep gap. I don't know why there's that one point down there, but really it would be where there's shoulders for several months.

Q. So if I look at the time when Goodnight

initiated injection into the EMSU, around the 2020 time frame, and I look back to even the period you selected, I'm not seeing much of a decline at all in the rates of production over this period of time. Would you agree?

A. Well, if you recall, back in March, April, May of 2020, that was COVID. So there was a huge amount of things affecting operations across the world. So I would anticipate that to be lower, and I wouldn't think that would be a very good pick.

Q. So if I go back to, again, a longer time frame over the EMSU -- and I don't do decline curves. I'm a lawyer, but just eyeballing this, and looking at a larger period of time, this is the first page of Mr. McGuire's Exhibit B-40, and I'm trying to eyeball the production over here, it looks like actually the production decline from January of '19 to present is not as steep as it was in previous years. Do you disagree with me?

A. You're later in the life of the flood, so you'd expect it not to be as steep.

Q. How does that square with your testimony that you're seeing excessive decline currently, in the present?

A. You're seeing it currently over that time

frame. You got to look to more -- you know, you just come down to a shorter time frame. And '19 and '20 were kind of messy times, into '21, because of all the COVID stuff that was happening. And then they shut-down the pipeline. And then so you got the rest of the production to work with.

We could have went back to October of '21 to present say, if you wanted to calculate that.

Q. Now, this is the only data you present in your testimony about any impacts to production; is that correct?

MS. HARDY: Objection. Misstates testimony.

MR. RANKIN: I'm asking --

HEARING OFFICER HARWOOD: Overruled.

BY MR. RANKIN:

Q. Mr. West, is there any other testimony you presented or exhibits or data, information in your testimony that reflects any decrease or decline in the production of the EMSU?

A. Not that I remember.

Q. Okay. I'm going to move on to your discussion of your economic models. In your direct testimony, starting at Page 13, under the Subheading F, called, "CO2 Flood of San Andres ROZ Interval," first section I've highlighted here

discusses how much CO2 Empire anticipates having to inject across each 40-acre pattern that you anticipate developing, and also states what you anticipate would be the recovery of oil over -- is that oil or CO2 recovery there?

A. Which part are you talking about?

Q. So this sentence I've highlighted here. It states that you'll recover approximately 500,000 barrels of oil there over a 20-year period.

So in this sentence that I've highlighted here, this refers to the economic models that you have attached as your Exhibits I-26 and I-27; is that right?

A. So it refers to -- I think the first one is talking about the Grayburg and the San Andres, but then it says given the more acres that 250 40-acres, it's 125 million out of San Andres alone.

Q. Okay. But that is referring to the economic model that you calculated that are attached at Exhibits I-26 --

A. Correct.

Q. -- and I-27; is that right?

A. Yes.

Q. And one is an economic model based on a 72-pattern CO2 flood, correct?

A. That is correct.

Q. And the other is based on a 250-pattern CO2 flood?

A. That is correct.

Q. And each pattern is based on a 40-acre spacing, correct?

A. That is correct.

Q. And as I understand it, the 250-pattern model includes the EMSU, EMSU-B and AGU, correct?

A. Correct. It includes about 10,000 acres. It could be applied just to the EMSU, which is about 14,000 acres. So it could squeeze all into there, but, you know, but we kind of look at this project in a whole across all three.

Q. So when I'm reviewing your Exhibit I and I'm trying to understand the economic model and how you did your calculations, I don't see an explanation for how this economic model works or any basis for any of its underlying assumptions about costs, about recovery, about how you're going to get -- how you calculated and whether you even calculate any recovery factors.

Can you point me to anyplace in this testimony where you explain how you determine what the recovery factor is going to be, for example, for

hydrocarbons in the San Andres ROZ?

A. So it was in the economic model spreadsheet itself. What we used, this model was going from -- it was built by Kinder Morgan to, you know, have some other engineers on staff that have experience with CO2, actually, three of them, CO2 and ROZ. And this was one that this economic model was built to assess different properties to whether or not it would be a good CO2 project or not.

It uses about an 18 percent recovery factor in it. And it times out your CO2 going in, pushing out your water, oil and then your reinjection. And then you can put -- you can build the models, build the patterns out.

Q. So let me go -- I think the description or the exhibits relating to the model start at PDF 50 here, which I think is the first one, I-26, correct?

A. Yes, sir.

Q. And this shows different charts from oil production, water production, CO2 recycle volume, and CO2 injection rate, correct?

A. Correct.

Q. So these are outputs from your economic model, correct?

A. That is correct.

Q. And I think this is for the 72-pattern economic model, right?

A. Yeah. They're similar shape.

Q. The same inputs went into both models, right?

A. That is correct.

Q. Okay. Just one was multiplied out for 250 patterns or 72 patterns, correct?

A. That is correct.

Q. And so this is an output for oil production, water production, CO2 recycle volume, CO2 injection rate, right?

A. Yes, sir.

Q. And each of these models assumes continuous CO2 injection, right?

A. That is correct.

Q. And not water alternating gas, correct?

A. That is correct. Standing for WAG.

Q. Standing for WAG. Okay. So that's what this chart is.

And this next exhibit here, I-27, is the spreadsheet that generated those outputs, correct?

A. This is the economic summary that was part of the output, yes.

Q. So I don't see anywhere here where you

got -- I'm trying to understand how you came up with an 18 percent oil recovery factor based on this chart, resulting in this oil production. Is it somewhere in your testimony where you explain how arrived at that 18 percent recovery factor?

A. It's all -- you know, so we arrived -- no, didn't put it in the testimony, but it's in the spreadsheet sheet itself. And it's 18 percent and it's based on Kinder Morgan's economic model that they built. So they had a couple engineers on the staff that brought the model over, and it's a pretty good, you know, initial economic analysis of the CO2. Whenever you don't quite have a full compositional model and, you know, we don't quite have the fluid from the San Andres, a few things.

So this allows us to build that out and you put pressure in, and it's a pretty good little model.

Q. Now, is there anybody else who has testified for Empire that addresses how Empire arrives at an 18 percent oil recovery factor for this economic model?

A. Stephen Melzer gave you indication of different things that could be recovery factors that he's seen in ROZ and different projects.

Q. Has Mr. Melzer conducted any assessment or evaluation, based any on any of the geologic data or engineering data related to the EMSU?

A. You've just got to use analogous fields.

Q. Did Mr. Melzer testify that the EMSU was analogous to any of the fields from which his recovery factors were derived, to your knowledge?

A. I don't remember exactly. He talked about Seminole, he talked about Tall Cotton. He talked about lots of different fields.

Q. So, again, Mr. West, I'm looking at your testimony and I don't see any reference to a recovery factor. Is it in your testimony?

A. I should have put it in there. But it was in the backup data.

Q. Is there anywhere in your testimony where you describe or explain how you came up with an explanation for how you're arriving at a certain value of amount of oil?

A. You know, the simple -- it's a 30 percent oil saturation, it's using a 10 percent porosity in the model. It's all in the input to the model there. I should have just made a table to put in here to summarize that up.

Q. But there's no explanation, right? I was

looking for it, trying to understand it. And I don't see it. But you're telling me that you're using an 18 percent oil recovery factor and you're relying on Mr. Melzer's testimony and opinions for that?

A. His opinions and other literature, the different pieces and using the previous model that, you know, a company that does a lot of CO2 and ROZ projects, like Kinder Morgan, using that as a representative good start.

Q. Is 18 percent the number that Kinder Morgan was using for its projects; is that what you're telling me?

A. Yes, sir.

Q. That's not stated anywhere in your testimony, is it?

A. That is correct.

Q. And do you know -- what field was Kinder Morgan using the 18 percent oil recovery factor for?

A. It's from all their projects that they had across the Permian Basin and from company experience.

Q. And you're telling me that Kinder Morgan uses the same recovery factor for all of its fields, no matter what and where it is?

A. Whenever they get more data and want -- and this is for a screening process, so this is a first

pass. There are some fields that get better than that; some that may get worse than that.

Q. How is 18 percent recovery factor comparing with what the recovery factor has been for the secondary recovery in the EMSU?

A. I don't recall off the top of my head what the recovery factor has been in the waterflood.

Q. Now, this portion of your testimony here, from F, from Subpart F, that's the sole -- that's the complete testimony that you provided that explains your economic evaluation for the CO2 recovery project in the EMSU, correct?

A. Correct.

Q. And you're providing this testimony and the exhibits that relate to it as evidence that a ROZ project can be economically implemented across all three unitized intervals -- rather, all three unitized areas in the AGU, EMSU and EMSU-B?

A. Yes.

Q. And this analysis applies only to continuous CO2 injection, correct?

A. Correct. We didn't take into -- you know, the benefits of what a WAG would be. It would reduce your CO2 purchase greatly.

Q. So you didn't provide us with an assessment

of what the potential economics would be for a WAG project, right?

A. No. But they would be better.

Q. So you mentioned one of the assumptions of your economic model is that there's an average oil saturation of 30 percent, correct?

A. That is correct.

Q. And I started talking with you about this the other day and I want to revisit it. But if you recall, Mr. West, you testified to me in your deposition that this economic model is based on a 400-foot interval with a continuous average oil saturation of 30 percent. Do you agree?

A. Never said continuous.

Q. I'm going to close out some of these documents, because my PDF is going to get fussy.

This is part of your 30(b)(6) deposition when you and I were discussing these economic models and I was trying to understand them. So I asked you -- at the time of your deposition, I asked you -- and this is Page 232 of your deposition, and this is again, your 30(b)(6) deposition, I asked you, "Where are we getting the 30 percent oil saturation from?"

And you told me that you're getting it from the log analysis and petrophysical data and it

could be a little bit conservative of it 30 percent. Do you recall that testimony?

A. Yes, sir.

Q. And then I asked you, "Is that oil saturation an average across the entire San Andres?"

And you said, "It's a good evaluation number for the San Andres."

And then I asked you: Because this model doesn't change the oil saturations by depth in the San Andres?

It doesn't change, right? Your model is using a consistent 30 percent oil saturation across the entire 400-foot interval, correct?

A. That is correct.

Q. It's the same oil saturation in the model for the entire 400 feet, correct?

A. The 400-foot. That would be out of a 1200-foot reservoir of the San Andres.

Q. That's right. And your model is assuming a consistent, continuous 30 percent oil saturation across that entire 400 feet, correct?

A. Yes, for it -- it is using 400 foot as the interval, the net interval.

Q. Okay. And do you recall my testimony -- were you present for Mr. McShane's testimony?

A. Yes.

Q. And did you hear Mr. McShane testify that he did not identify any section of any of the log intervals that contain average saturation of 30 percent that would extend 400 feet across the San Andres?

A. I'm trying to understand your question. Could you rephrase it.

Q. Do you recall Mr. McShane testifying that he did not identify any interval in the San Andres that had an average oil saturation of 30 percent that extended for 400 feet?

A. That was a -- I think you had said in that piece that it was a continuous one.

Q. Correct.

A. That is correct.

Q. Okay. And so none of NuTech's well log interpretations provide a continuous interval of 30 percent oil saturation that would justify that assumption in your economic model. Agree?

A. Rephrase it again, make sure I --

Q. None of NuTech's well log interpretations provide a continuous interval of 30 percent oil saturation that would justify your economic model assumption. Agree?

A. If you break it up, it's going to be relatively the same in the economic model.

Q. Your economic model is assuming an average 30 percent oil saturation for 400 feet across the top of San Andres. Agree?

MS. HARDY: Objection. Asked and answered. This has been established.

HEARING OFFICER HARWOOD: Overruled. He's laying foundation.

A. I have a net interval across the San Andres.

Q. Now, I just was asking you, because you just told me that the economic model doesn't have any net intervals, right? It's a continuous interval of 400 feet, is what you're assuming in your economic model.

A. I'm taking a 400-foot injection interval, a net interval.

Q. So I'm asking you, is there any of the well log interpretations or petrophysical log analyses that were presented by or sponsored by any of your experts that reflect a continuous 30 percent oil saturation of 400 feet, across a 400-foot interval, similar to what you're assuming in the economic model?

A. My economic model is using a net 400 foot. But no, there is not a log that has just a continuous 400 foot.

Q. Did you have one of your experts or petrophysics or log analyses experts sponsor an oil saturation analysis that you used in your economic model?

A. I used lots of different bits of, pieces of data. As you can tell, there's a lot of different varying opinions on an analysis. Right? Because when you take logs and you do log analysis, it's always an interpretation, and so some were high, some were low. And if you take the core and average, it seemed like, you know, that would be a good representative, would be 30 percent. Because you don't know until you start to take more core of the interval and a larger interval than your currently have.

Q. Is that oil saturation that you're using in the economic model, is it based on any of your experts' opinions or any of the expert work that Ops Geologic did? Or is it based on the oil saturations that were prepared by Ops Geologic, for example, number one?

A. It's taken into account for what they all said and saying that hey, a good representation would be 30 percent.

Q. But you're not using -- for example, you're not taking the evaluation or assessment that Ops

Geologic did and then using that for your economic model, correct?

A. Not using one individual one. I'm taking all the data points.

Q. And you didn't take NuTech's analysis of their oil saturations that they did or even that Empire instructed them to do. You're not using that for you economic model. Agree?

A. Looked at NuTech's, looked at Ops Geologic. Looked what, you know, Exxon had said before, looked at all of them and said, you know, let's -- you know, look at the cores and said that 30 percent would be a good representative to build a model off of.

Q. Then you took what they did and you made it a continuous 30 percent oil saturation across 400 feet, correct?

A. Right. I don't have a fancier model that I could break it out.

Q. You couldn't vary the oil saturations to match one of your expert's opinions?

A. Not in the model.

Q. It doesn't have a cell representative of each foot? You couldn't evaluate it based on what your experts are telling you the oil saturations are?

A. You know, the model is over 10,000 acres.

Picking one individual log would be incorrect.

Q. Okay. So rather than trying to match what your experts are saying or doing, you made your own decision about what the oil saturation should be across a 400-foot interval. Agree?

A. Yes.

Q. Okay.

HEARING OFFICER HARWOOD: Mr. Rankin, would this be a convenient time for a mid afternoon break?

MR. RANKIN: It would be a greet time, Mr. Hearing Officer.

HEARING OFFICER HARWOOD: Let's take 15 minutes.

(Recess held from 3:00 to 3:15 p.m.)

HEARING OFFICER HARWOOD: Let's proceed.

Mr. Rankin, do you have any idea, forecast, of how much more you might have?

MR. RANKIN: I'm afraid to get into the business of prediction, but I really do want to try to finish relatively soon. So I'm hoping that sometime within the next hour I'll be done.

There's basically two main topics left that I want to discuss, and I'm partway through one of them. So I'm hoping that within the next 30 to 40 minutes, I'll be done.

HEARING OFFICER HARWOOD: Okay. Well, it is all relative.

MR. RANKIN: It is all relative.

HEARING OFFICER HARWOOD: Thank you.

MR. RANKIN: I understand. Are we ready to go, Mr. Hearing Officer?

HEARING OFFICER HARWOOD: Sure. Please proceed.

BY MR. RANKIN:

Q. Mr. West, we were, prior to the break, discussing the economic model that you presented in your testimony. As I understand it, the economic model presents two cases, one for a 72-pattern CO2 injection case, and the other for a 250-pattern injection case, correct?

A. Yes, sir.

Q. And for each of those patterns, you only ran one output, right?

A. That is correct.

Q. So you didn't run any sensitivities on any of the variables or inputs that you used in economic calculations, did you?

A. Not at the time when we did that.

Q. And you didn't present the Commission with any sensitivities based on different input parameters

for most models, have you?

A. I have not presented any.

Q. So no ranges for costs of CO2, for example?

A. Correct.

Q. And no ranges for different oil saturations, correct?

A. Correct.

Q. And no ranges for prices of oil, correct?

A. Correct.

Q. And, in fact, you assume for your oil pricing starting out at $75 per barrel, correct?

A. That is correct.

Q. And you assume a 1 percent incremental increase, escalation every year, correct?

A. Yes, a pretty conservative one over the 43 years of the project, I believe.

Q. Okay. And among the assumptions, as you state in your testimony, you're assuming that 75 percent of the wells for the San Andres ROZ projects are going to have to be new drills, correct?

A. I'd have to sit down and think on that project. I mean, we've got, like, 105 existing wellbores that we could deepen to reduce some of those costs. But I think in the project, yeah, I think we did assume, yes. That's what we assumed in the

project. Kind of little bit heavy on it.

Q. No problem. I guess my question is, why wouldn't you need to drill 100 percent new wells?

A. Because you've got 105 -- roughly 105 wellbores within the EMSU that have at least 7-inch casing down to the bottom. So you could use full-size conventional tools to deepen that well.

Q. Are those wellbores in a condition suitable for injection of CO2?

A. Whenever you drill the bottom part of it, that would be an extra image you would run, and so yes, it would be.

Q. And the cement would be in a condition that's approvable for CO2 injection by the Division?

A. You would be, you know, drilling down into the new intervals, so you would do cement to match that.

Q. Okay. So have you evaluated whether or not those wells, those 25 percent of the wells what you'd be able to reenter, would qualify under the Divisions's rules and regulations for injection of CO2?

A. You would be drilling a new hole into it because they're not presently deep enough. And so you would put, you know, what's the spec of the cement

that would match the regulations of the Commission.

Q. My question is, did you do an assessment to determine whether or not the condition of those -- the 25 percent of wells that you would need to drill new, have you made an assessment to determine if those wells would qualify under the Division's requirement for injection of CO2?

A. I guess I would need to see the requirements. But you're drilling a new hole where you're going to inject. You're putting whatever spec cement in the well.

Q. I think you've answered my question, because you haven't reviewed the Division's requirements for CO2 injection?

A. No.

Q. Okay. On your economic modeling which way would the economics go if you decreased the ROZ interval?

A. If you decrease the ROZ interval, the CO2 would pass through the reservoir quicker, so you would move the production forward and you would use less CO2. And so your rate of return would go up and it would be a little bit higher.

Q. You think the economics would go up if you decreased the CO2 interval -- I'm sorry. You think the

economics go up if you decreased the oil saturation interval?

A. The net thickness? Which --

Q. Your economic model uses an oil saturation of 30 percent over 400 feet, correct?

A. That's correct.

Q. And if you reduce that ROZ interval to 300 feet, what would that do to the economics of your project?

A. So you shorten the thickness of the interval, the CO2 would be able to impact the rock quicker and you would produce oil back faster, would move through the reservoir quicker. So that would bring forward your oil curves and it would also bring forward your CO2 recycling.

Q. Have you done that analysis in your economic model?

A. Since then we've played with the model.

Q. Have you done an analysis to evaluate what happens when you decrease the ROZ thickness?

A. Yes.

Q. And what does that do to your economics?

A. Like I said, it will bring your net present value -- it will increase that. Overall, you know, since there's less reserve, the overall, you know,

cash would go down a little bit. Your rate of return would go up because you're getting product back faster.

Q. And overall, what does it do to the economics?

A. I just -- which piece of the economics are you talking about? There are a lot of --

Q. Bottom line.

A. Which -- there's lots of -- I mean, people look at lots of different pieces of economics. Which -- do you know, you know, which category?

Q. So what I'm trying to figure out, when I look at your PowerPoint, for example, and you're telling the Commission that there's going to be a cumulative cash flow of $5.5 billion, what does the decrease in the ROZ interval, say, from 400 feet to 300 feet do to your cash flow?

A. It will reduce it.

Q. What happens when you reduce the oil saturation in your model?

A. It'll reduce the cum cash a little bit.

Q. You talked about just now that there -- about the potential for reducing the cost by recycling CO2. Do you recall you just mentioning about there would be a -- if you decrease the interval of the ROZ

that it would increase the rate that you gave your CO2 back, correct?

A. It will come back earlier.

Q. Have you done any analyses to determine at what rate CO would come back?

A. Can you clarify your question?

Q. You're telling me that if you decrease the ROZ interval, that you're going to get CO2 back more quickly, right?

A. That is correct.

Q. So I'm asking you, have you done any analyses to determine at what rate you're going to get CO2 returns in your CO2 project?

A. It'll come back earlier. I mean, it would have to be a particular run and run a sensitivity on it. It's going to come in faster.

Q. I guess my question is, you're just telling me that right now. Is that off the top of your head or is that based on your experience? Or did you actually conduct an analysis to determine what the rate of return of CO2 would be for the San Andres?

A. It's just a mass balance. So if you're putting in the same amount of CO2 and there's less reservoir, it's going to come out the other end quicker, so you would have it back into place to put

back in.

Q. So that's just based on your rationale or logic, that response?

A. Just two particles can't be in the same space at the same time.

Q. My question is simply, like, did you do some sort of engineering analysis to determine what your CO2 return would be?

A. The model will do it.

Q. In your testimony, where does it do it in the model?

A. I mean, you can see there where it's, you know, the CO2 recycle volumes, or whatnot. It would calculate and make that curve.

Q. Do you address that anywhere in your testimony?

A. I did not run those sensitivities and put them in my testimony.

Q. Did you describe how you made that determination in your testimony, how the model makes that determination, in your testimony?

A. Which part of it?

Q. The CO2 return, the CO2 recycle volume, how it calculates that.

A. We provided you with the data sheet that has

all the inputs and the spreadsheet. It's not in my testimony, but you were provided the data, the whole model.

Q. Okay. But it's not in your testimony, it's not in your exhibits. Agree?

A. Agree.

Q. So the Commission hasn't seen that and it wasn't provided to the Commission. Agree?

A. Agree.

Q. Okay. So when I go back to your PowerPoint presentation, I think you're discussing the larger project here, the 250-pattern project in Slide 7 of your presentation, correct?

A. Correct.

Q. And the capital costs here are calculated from your economic model for that pattern, correct -- for that project?

A. The 250-pattern project.

Q. And the total capital expenditure would be 1.2 billion over the entire life of the project, correct?

A. That is correct.

Q. We heard yesterday in testimony from Mr. Wheeler about the financial status of the company over the last two years. How will Empire finance this

project $1.2 billion?

A. We'll get funding for it. It won't be a problem.

Q. Who is going to fund it?

A. It'll be funded by investors.

Q. Okay. Have you prepared any statements for investors to consider how Empire is going to pursue this project?

A. I've got to stop this pollution first before we can ever go to raise money.

Q. So Empire has undertaken no steps at this point to put together a proposal for developing any investment for this project; is that correct?

A. There's been discussions. You know, upper management and things had discussions of this project in particular with people that would be able to well fund it. But we cannot move past initial discussions until you stop the pollution into the reservoir.

Q. Empire has had discussions with potential funders?

A. The investors, chairman and things, yes, he has.

Q. To your knowledge, Mr. Mulacek has had discussions with potential funders for a CO2 project in the EMSU?

A. Yes.

Q. Do you know who those potential funders would be?

A. No, I do not.

Q. Have you obtained any bids or estimates for any of the wells facilities or other costs that would be required to undertake a CO2 project of any kind November EMSU?

A. At this point in the process, we have estimates, as you don't really go out to bid until you're ready to buy equipment.

Q. So you do have estimates for costs for a potential project? Yes?

A. They're in the model.

Q. They're in the model. Okay. What are those assumptions based on?

A. They're based on the rough price of what the equipment would be that you would plan to acquire for the pipelines, the facility, the wells.

Q. Did you provide any basis or substantiation for the assumptions made on those prices in your testimony.

A. I think you're early in the project and all of it, so, you know, you make the assumptions. You don't go out for bids.

Q. And briefly, we discussed your starting price of oil at $75 a barrel, correct?

A. Correct.

Q. I just happened to look at the oil price last night, and it's down to $58 a barrel, or something. And have you run any -- I think you know the answer to this question, but just to be clear, you haven't run any other models of variation of range of prices. Agree?

A. There wouldn't be a need to at this point in time.

Q. Why not?

A. Because 75 is a good starting point whenever the model was ran at the beginning of the year. And you're not starting the project right now until we get this cleared up. And if you, you know, look in the history of the oil, that's a very reasonable starting point for where we're at.

Q. But you didn't run a flat price scenario, did you?

A. No one would really do a flat price scenario for a 42-year project.

Q. Mr. Marek ran a flat price analysis for the EMSU waterflood, didn't he?

A. Why don't we pull up that analysis of

Mr. Marek's, that Cobb Report, because it has a 5 percent escalation point in there, too.

Q. It does, it has an escalation. It has a range. He did a range. He did 5 percent and he did flat price. So he had a range of analyses that he did, correct?

A. That's correct.

Q. And you only ran one analysis, correct?

A. At 1 percent, pretty conservative. If you go back the last 42 years, that's about a 1.82 percent increase, annual percent increase. So one is pretty fair.

Now, he ran a pretty aggressive 5 percent case in that economic analysis. We're not anywhere near a 5 percent.

Q. Okay. And is past performance an indication of future performance, Mr. West, in your experience?

A. You got to use the past to help to build a model to predict the future. So, you know, past indications of oil, where you have a long history, that's a pretty good .

Q. Generally, isn't a flat price required for and SEC report?

A. For SEC, but that's just looking, like, in the short term, and that's been like a year.

Actually, that's not looking for something that somebody would invest in a 42-year project.

Q. In other words -- I'm sorry, I didn't mean to interrupt you.

A. If we took Mr. Marek's project, right, where I think it was $18 a barrel of oil, and if you just took that as a point and ran a flat case and a 5 percent and if you took that, escalated it to the beginning of this year, that was about a 3.88 increase annually. So, you know, kind of undershot on the one, maybe overshot, I mean, add them, you know, flattened out after a while.

Q. I guess my point simply is, though, Mr. West, that he provided a range of potential outcomes, not just a single scenario. Correct?

A. Correct.

Q. Now, another assumption in your model is that you used a $1 price per MCF for CO2, correct?

A. That is correct.

Q. And you state that the project would allow for 471 cubic feet of CO2 to be sequestered as a result of the injection, correct?

A. Yes. It could be.

Q. Have you done any studies to confirm that volume of CO2 could actually be sequestered in the

San Andres?

A. There would be some that would be left behind, just by the nature of the flood. And it's, you know, a reasonable number.

Q. My question is, did you do any studies to determine whether that volume could be sequestered?

A. Any extra studies, no.

Q. So that was just a reasonable number that you chose as a potential amount that could be sequestered?

A. Yes. So talking with, you know, other people, staff and things and putting together, yes.

Q. Okay. And you, among other experts, on behalf of Empire testified that there are natural fractures all through the San Andres and Grayburg, correct?

A. That is correct.

Q. Causing the formations to be in fluid communication, correct?

A. That is correct.

Q. How would this project ever qualify for a 45Q tax credit just based on Empire's testimony and the exhibits that it has presented in this case?

A. So the top of the reservoir, there's an established -- used to be a gas cap up there. And so

you've got an established gas cap up there.

Also, you've got a really pretty good perm barrier around Zone 3 or 4 in the Grayburg. And that part that's a baffle, you could -- one of the ways you could go about it, you could flood Zones 1 and 2 with a lot of water, add another water cap, which is very common in a CO2 project. So there's a lot of different ways to add extra barriers in.

Q. Beyond just conceptual discussion, have you done any actual engineering or geologic determinations to confirm whether that would meet the requirements of a 45Q tax credit?

A. We'd have to, you know -- we have sister companies and things that do a lot of that business, and it seems reasonable that we would be able to go through all that, but there's a lot of expense and a lot of things that go into that. And we can't really move forward with an investment while there's ongoing damage to that ROZ.

Q. My question is, though, have you done any determination -- I mean, you're making a big assumption that it would qualify and would have big impact on your economics, correct? If you can qualify, it has a big impact on the economics of this project. Agree?

A. It's not necessarily solely on the sequestration.

Q. So part of the assumption is that you or the seller of the CO2 would be able to qualify for a 45Q tax credit. Agree?

A. Agree. That can -- you know, that's a lot of things that can affect that CO2 price.

Q. I'm just talking about the model. You made an assumption that based on qualification for the 45Q tax credit, you would be able to buy CO2 at a $1 per MCF, correct?

A. No. Made an assumption that we'd be able to buy CO2 at $1 an MCF.

Q. Okay. And that was based on the 45Q tax credits. Agree?

A. That could affect the price of the CO2.

Q. When I deposed you, Mr. West, you told me that that basis for the 50 cent discount was based on the 45Q tax credit, correct?

A. That's definitely something that can give you the discount.

Q. So if you aren't able to acquire a 45Q tax credit, then what's the basis for the $1 per MCF price?

A. That's a negotiation. You could, you

know -- it's, you know, "Hey, I've got this project. I want to buy this much CO2," and you negotiate different terms.

Q. And just to be clear, who would benefit from the 45Q tax credit? Would it be Empire or would it be the seller of the CO2?

A. I'm not sure. Depends on which deal was negotiated.

Q. When I deposed you, you told me that the seller of CO2 would be the beneficiary of the tax credit, correct?

A. Probably. It could be either way, but yeah, I mean.

Q. That's what you testified to in your deposition, correct, that the seller of the CO2 would be the direct beneficiary of the tax credit?

A. I'll believe what you say. That's one scenario for sure. We have not negotiated a contract, so it's hard to say.

Q. Okay. Well, I'm not going to spend the time impeaching you, Mr. West.

So the question I have, then, is, have you had any discussions, then, with any CO2 suppliers?

A. People within the company have.

Q. And under the 45Q tax credit, in order to

qualify, would it have to be anthropogenic CO2?

A. That's one method.

Q. Are you aware of any other methods to qualifying for the 45Q tax credit that are not anthropogenic?

A. I think you can get some if there ends up being some that stays in the reservoir and it's stored in the reservoir.

Q. Okay. So you're assuming that some is going to be stored in the reservoir, but you haven't done any analyses or studies to confirm what volumes would actually be stored, correct?

A. No studies where volume is concerned. But, you know, you put it down in there, not all of it is going to come back.

Q. And you haven't done the study to evaluate how much of that CO2 would likely stay in the reservoir. Agree?

A. Agree. We would need to go ahead and gather more core and we would need to do more analysis.

Q. You haven't yet done that analysis. Agree?

A. That's correct.

(Pause in the proceedings.)

HEARING OFFICER HARWOOD: All right. We're back on the record.

Mr. Rankin, you better speak fast.

MR. RANKIN: Mr. Hearing Officer, thank you very much.

BY MR. RANKIN:

Q. Mr. West, in terms of the proposed CO2 injection, has anyone from Empire, to your knowledge, met with OCD to discuss Empire's proposed CO2 injection plans to see if CO2 would even be approvable by the Division in this formation?

A. No need to do that until we get this cleared up first. But then yes, the intention will be to.

Q. I guess if it's not approvable by OCD, then maybe it's not an issue. Agree?

A. Say that again.

Q. If the CO2 injection is not approvable by OCD, given the conditions in the formation, then maybe it's not even an issue. Agree?

A. Well, it would take a lot of work to make that determination and probably gathering core and different pieces of data that we do not have at present time.

Q. Well, I'm asking about the CO2 containment. You haven't discussed anything with any agency about whether or not there's sufficient containment by the formation to determine if CO2 injection is approvable

in this zone, correct?

A. There's a long process and there's a lot of data that you better bring to the table, and some of that we do not have now. So we do not have all the data to make that proposal to them yet.

Q. So the answer is you haven't met with OCD to discuss whether it would be approvable, correct?

A. That is correct.

Q. Now, are you aware that there's a history of fluid communication between the Grayburg and the overlying Penrose and Queen Formation?

MS. HARDY: Objection. States facts not in evidence.

HEARING OFFICER HARWOOD: You might have to lay more foundation for that.

MR. RANKIN: Sure, Mr. Examiner. I'll bring up what I'm going to mark as Goodnight Cross Exhibit Number 24. As soon as I get my screen-sharing, I'll pull that up so everybody can see it.

Mr. Hearing Officer, this is a prehearing statement in Case Number 12320 before the Oil Conservation -- I believe it's before the Division. And this is regarding an application by Chevron for the approval of additional waterflood injection wells in the EMSU. I'm going to move this

prehearing statement and its attachment as Goodnight Cross Exhibit Number 24. And I'll share it with Ms. Hardy.

MS. HARDY: I object. I think a prehearing statement is an argument filed by a party. It is not any sort of evidence submitted in a case.

HEARING OFFICER HARWOOD: I'm not hearing what it's being offered to prove, I mean, so --

MR. MOANDER: Mr. Hearing Officer, I'd like to point out that pleadings are generally admissible in most proceedings because they've been filed as a matter of record.

MS. HARDY: Well, I'm not sure this is Mr. Moander's exhibit. I don't believe it is. So I think that the Commission can take administrative notice of pleadings, but it's certainly not evidence. And it wasn't evidence in the case in which it was filed either.

HEARING OFFICER HARWOOD: What's the purpose for offering this?

MR. RANKIN: Mr. Hearing Officer, I appreciate the question. I'm happy to pull up the evidence from the record. I thought this was a shortcut, but I can actually -- I'm happy to present the evidence what Mr. Doyle Hartman presented showing

that there was communication up in the Penrose from waterflood injection in the EMSU. And I'm happy to bring that up.

My simple point here I wanted to make was that an overlying operator of wells made the claim at the time that there was fluid communication from the EMSU into the shallower gas producing wells as a result of the waterflood injection.

And I'm happy to do it, I can do into the OCD records and pull up the data that shows where wells that previously had not been producing water that are gas producing wells started producing water following the waterflood injection.

HEARING OFFICER HARWOOD: I'm going to take that statement as an offer of proof as to this potential exhibit. But my understanding is you had a pending question with this witness about the communication between the Grayburg and the Penrose, I believe, above it.

MR. RANKIN: My question was whether he was aware that there was a history of fluid communication issues between the Grayburg and Penrose.

HEARING OFFICER HARWOOD: So my understanding is you're going to try to use this document to establish the foundation for that and see

if the witness has a better answer.

MR. RANKIN: That's my intent, Mr. Hearing Officer.

HEARING OFFICER HARWOOD: I'll let you make that effort.

BY MR. RANKIN:

Q. So, Mr. West, this is a prehearing statement that was filed in this case by Mr. Doyle Hartman. He's an operator of oil and gas wells and shallower formation at the time and made a complaint and objected to Chevron's application for additional waterflood injection wells.

And according to his prehearing statement, Mr. Hartman states that he's experiencing significant produced water in his Eumont gas wells within the boundaries of Chevron's waterflood.

As a senior VP of operations in the EMSU, have you been aware of any issues about fluid communication between the shallower formations in the EMSU?

A. I've never seen this document before.

Q. That's not my question. My question is, have you been aware, as a senior vice president of operations of Empire for the EMSU, of fluid communications between the Penrose and Queen and the

Grayburg in the EMSU?

A. I know that the Penrose, a lot was the, if I believe right, the gas cap piece of the reservoir. And that's kind of always been in that unit documentation.

Q. So I don't think that answered my question. Are you aware of a history of fluid communication between the Queen and Penrose and the Grayburg in the EMSU?

A. I mean, you know, if it's the gas, gas is a fluid, so that would be -- you know, that's part of the gas cap. Then that's...

Q. Are you aware that there's fluid communication between the Penrose and the Grayburg? Yes or no.

MS. HARDY: Objection. I think there's not been sufficient evidence to establish that there's migration between --

MR. RANKIN: I'm asking if he's aware of it, and he can say yes or no, "I am aware" or "not aware."

HEARING OFFICER HARWOOD: All right. I'm going to construe that has a hypothetical, because I don't see this statement, Hartman's statement of the case on the screen as establishing a foundation for

that.

MR. RANKIN: Okay.

HEARING OFFICER HARWOOD: So we'll treat your question as a hypothetical. There hasn't been a straight answer to it, so it is a yes or no question.

A. Can you repeat the question?

Q. Sure. Are you aware of a history of fluid communication between the Penrose and Queen formations and the Grayburg in the EMSU?

A. You know, gas is a fluid and it's being considered as part of the gas cap. Am I aware of what the pieces of this case of -- this case, I've never seen that part before, no.

Q. So are you telling me that because gas is a fluid and you have gas in both the Penrose and Grayburg, that there is communication between those formations?

A. Yes. I mean, you know, gas is a fluid.

MR. RANKIN: No need to move to admit that exhibit, Mr. Hearing Officer.

HEARING OFFICER HARWOOD: I'm sorry, what was that?

MR. RANKIN: No need to move to admit that exhibit, Mr. Hearing Officer. Thank you.

HEARING OFFICER HARWOOD: All right. It's

withdrawn, then.

MR. RANKIN: Thank you.

BY MR. RANKIN:

Q. Mr. West, are you also aware of the issue presented at the EMSU unitization hearing regarding 122 wells that were drilled in the '30s and '40s with open hole completion that had commingled production between both the Penrose and the Grayburg within the EMSU?

A. I can't say I reviewed all those wells from -- restate your question.

Q. Sure. I'll start over okay. This is Goodnight's Exhibit B-49 from Mr. McGuire's testimony. And it shows a map of the EMSU and identifies 122 wells that are commingled between the Penrose and Grayburg. And it was presented at the unitization hearing. Are you familiar with this map?

A. I'm not familiar with it, but it looks like the unit and what was in it.

Q. Are you familiar with the fact that there are these wells that had commingled production between the Penrose and Grayburg?

A. If I remember correctly, on the unit agreement, isn't it -- doesn't it extend 100 feet above the Grayburg to address a lot of these issues?

Q. Partially. But some of these wells are completed in the Eumont gas pool.

A. I don't see documentation that says that it is or not on this. I don't...

Q. So you're not aware about the issues that these wells were completed in the Eumont gas pool and they were also completed down into the Grayburg? You're not aware of that?

MS. HARDY: Objection. I don't see that this exhibit necessarily shows that. I mean, it --

MR. RANKIN: It does. It's says -- the title says, "Completions Overlapping Eumont and Eunice - Monument Oil Pools." So there's two different pools and these wells are commingled in both those pools.

HEARING OFFICER HARWOOD: Does that resolve your objection, or not?

MS. HARDY: Well, I can't tell if the wells are commingled. I understand the map is showing two overlapping fields, but I'm not sure that's the same thing.

MR. RANKIN: Mr. Hearing Officer, if I may respond.

HEARING OFFICER HARWOOD: Go ahead. I frankly don't have the technical expertise to

evaluate the merits of the objection.

MR. RANKIN: Sure. What this map is showing, it says that there are completions. Okay? Which means that the wells are completed and that perforations in the casing allow them to communicate with the formation. And what it's saying here, is that there are completions in two different pools; one in the Eumont gas pool and the other in the Eunice pool. So there are two different pools.

And the point of this exhibit, which was discussed extensively in the unitization hearing, is that these wells are commingled between not just wells intended to be unitized, but also shallow -- a shallow gas pool.

HEARING OFFICER HARWOOD: Okay. I'll overrule the objection.

BY MR. RANKIN:

Q. My question, Mr. West, is simply whether you're aware of this issue. Number one, are you aware of it?

A. This was -- I'm still unclear of the way this is, that I don't necessarily say that it says that it's commingled into it. And I don't know what they did from the 1930s to the unitization to each one of those wellbores to -- you know, to form the unit,

if they put plugs in them or not.

Q. I understand. That's my question, just whether you're aware of it, whether you have knowledge about these wells, whether they have been addressed or not. And you're telling me that you're not aware, correct?

A. This is an old document. If I'm aware of your document that you put in front of me now, that's about it.

Q. And so you don't know whether these wells have been remediated to correct -- assuming they are completed in two different pools, you don't know, as you sit here today, whether those wells have been remediated so that they're no longer commingled in those different zones, correct?

A. I would assume that in the formation, the unit has agreements that they worked on the wells to be the different -- you know, so one's in the unit, one's in the bowls to remedy that. I would assume that they remedied that.

Q. That's just an assumption, correct?

A. Correct.

Q. Mr. West, this is Exhibit B-6.1 from Goodnight's direct testimony, Mr. McGuire's direct testimony. And it's also from the unitization

documents. Have you ever seen this exhibit before?

A. Yes.

Q. Do you agree with me this is basically a cartoon characterization of the generalized cross-section of the EMSU? Correct?

A. A generalized tract section, right.

Q. What you're describing to me is that the unitized interval is defined as minus 100 feet subsea, which in some areas captures the Grayburg and some areas goes above the Grayburg, correct?

A. And this is what this diagram shows?

Q. Is that not the case in reality? Does the minus 100 feet not go above the Grayburg in some portions of the unit?

A. I'd have to look at -- you know, this, I'd have to look at the maps to determine that. I don't know that off the top of my head. You're going to have to show me.

Q. Very well.

A. Like you said, this is a cartoon.

Q. So, Mr. West, this is Goodnight Exhibit F-26. And do you recognize this document, which is the basis for your 250-foot subsea formation pressure? Correct?

A. Could you scroll up to the stop so I can

see?

Q. Well, it's an excerpt from that document, correct?

A. I don't know. I guess I don't know which document you pulled it out of.

Q. This is from Mr. McGuire's Exhibit F-6. And these are the cross-sections that were presented at the EMSU unit hearing. This is Figure 98. Do you see that?

A. Figure 98, on the bottom left?

Q. When I scroll through, there's a series of these cross-sections in each one of the different figures from the EMSU unitization hearing. Okay? And it shows that you have the top of the Queen is the black, the top of the Penrose is the green, and the top of the Grayburg is the red. Do you see that?

A. Okay. Yeah, I see that's what the diagram is depicting.

Q. So Figure 100 from the EMSU unit hearing, it shows that minus 100 subsea in some places is below the Grayburg, in some places it is above the Grayburg, especially when you get off the structure to the west and southwest. Do you see that?

A. Yes. Just looking at the directions. Okay? Looks like it's an east/west line.

Q. So as you go to the west, you get off structure, the minus 100 subsea goes -- or rather, above the Grayburg. Do you see that?

A. Yes, I see that.

Q. So, as you explained to me, the reason they did that was in order to ensure that they could capture production from the Penrose, correct?

MS. HARDY: Mr. Examiner, I'm going to object to this entire line of questioning. I don't think it's relevant to the issues that are before the Commission. We're not here on a unitization application filed by Empire. This is taking us far, far afield, and we've already taken a very long time.

HEARING OFFICER HARWOOD: Where are you going with this?

MR. RANKIN: Mr. Hearing Officer, Mr. West testified that there's communication, gas communication, fluid communication, between the Penrose and the Grayburg.

And I'm establishing here that within the EMSU and the boundaries, there's no barrier between the Grayburg and the Penrose.

MS. HARDY: I don't think he did testify to that. I think Mr. Rankin has attempted to establish that. It's not at issue anyway.

HEARING OFFICER HARWOOD: Okay. What is the relevance, even if he --

MR. RANKIN: Well, my point --

HEARING OFFICER HARWOOD: I think what he said is that if you consider gas as a fluid, then there's going to be an occasion between the two --

MR. RANKIN: Right.

HEARING OFFICER HARWOOD: -- in answer to your question. Assuming that's true, what is the relevancy?

MR. RANKIN: The relevance here, Mr. Hearing Examiner, is that when Empire seeks to inject CO2 into the EMSU, there's no containment within the EMSU to hold that CO2 in place. And it's an issue that cannot be resolved by engineering or any type of operational approach.

And my point here is to establish on the record that there's no basis for them to inject into the EMSU because there's no way that they're going to be able to contain that CO2.

HEARING OFFICER HARWOOD: Response.

MS. HARDY: Yes. We are not here on a unitization application. And I can pull up the orders from the Commission on the original unitization application, which did refer to tertiary

recovery. So it has been contemplated and it has been discussed.

And regardless, I think it's not relevant. I think Goodnight is trying to turn this into a case about unitization by Empire on tertiary recovery, and that's not why we're here.

MR. RANKIN: One response, Mr. Hearing Examiner, and I want to make this point very clear, that Empire has said throughout this hearing that the only way to move the ROZ oil in the San Andres is to use CO2, that's the only way to recover that oil. So it's absolutely at the heart of this case.

If it's impossible for them to get approval for CO2 injection because there's no way to contain the CO2, which is a gas, in the EMSU, then it's very critical to this case.

HEARING OFFICER HARWOOD: All right. Well, I'm going to rule in favor of Empire on this issue. You still have your entire case to put on, Mr. Rankin. You can establish that with your witnesses.

MR. RANKIN: Mr. Examiner, because this is Empire's last witness, and a critical one, I might ask just for three minutes to confer with my clients to make sure I have no further questions.

HEARING OFFICER HARWOOD: Totally.

MR. RANKIN: Thank you.

HEARING OFFICER HARWOOD: We'll come back at 4:15.

MR. RANKIN: Thank you.

(Recess held from 4:10 to 4:15 p.m.)

HEARING OFFICER HARWOOD: Go ahead.

MR. RANKIN: Thank you, Mr. Hearing Officer. After having a chance to confer, I have no further questions at this time for Mr. West.

I appreciate the testimony, Mr. West.

And thank you, Mr. Hearing Officer.

THE COURT: Thank you, Mr. Rankin.

All right. Mr. Moander.

MR. MOANDER: Yes. I have a relatively short cross-examination, recognizing that's coming from a lawyer. But I'll go ahead and get started here.

CROSS-EXAMINATION

BY MR. MOANDER:

Q. So just to confirm, you're senior vice president of operations at Empire; is that right?

A. That's correct.

Q. And you were presented here today, if my notes are correct, as a petroleum engineer with, we'll

call it, maybe specialization in production and operations, right?

A. Yes, sir.

Q. Your attorneys in this case filed your direct testimony in this case. And I'll represent that was about August 26th, 2024. Does that sound about right?

A. That sounds about the right time frame.

Q. And then after that, you were called to a deposition on December 3rd and 4th of 2024, correct?

A. Yes, sir.

Q. And I asked you some questions that day, right?

A. Yes, sir.

Q. We're going to walk through this a little bit, because I just want to firm up what was discussed. So at that deposition you were sworn under oath to tell the truth, correct?

A. Yes, sir.

Q. During that deposition, I asked you some questions about Empire's anticipated plans for development of the ROZ that forms the core of this case, correct?

A. Yes, sir.

Q. And one of the questions I asked about that

anticipated development plan for the ROZ was whether or not Empire had factored in Safe Drinking Water Act; is that right?

A. Yes, sir.

Q. And when I made inquiry of you about that, what you testified to was that Empire would handle that issue through surface casing depths and surface casing settings and proper isolation through concrete. Does that sound right to you?

A. Correct for wells, yes.

Q. And that's what we're focusing on here, is the wells. Would you agree with that, as well?

A. Yes, sir.

Q. All right. And then we had a discussion, as well. I asked you about whether or not Empire's anticipated ROZ development plans addressed migration from the San Andres to the Hobbs Channel to the Capitan Reef, right?

A. Correct.

Q. And when I inquired about that, you referred me to Empire's expert, Robert Lindsay?

A. Correct.

Q. But prior to that, I asked you whether the anticipated ROZ development plan referenced the Hobbs Channel in and of itself; do you recall that?

A. I lost you in the question. Can you repeat it, please?

Q. I can repeat that. Verbosity is a problem with these things.

At the time that you were deposed, did the anticipated ROZ development plan incorporate or factor in the Hobbs Channel?

A. Since that time, I believe we had the discussion that we would be working on the full plan of the ROZ. We did not have the full development plan put together yet.

Q. And so at that time, you did not, in fact, address the Hobbs Channel in the anticipated ROZ development plan, right?

A. Correct. But we would anticipate -- take all factors in.

Q. One last question, though, about the San Andres to Hobbs Channel to Capitan Reef. Aside from referring me to Dr. Lindsay, I inquired whether or not the plan at the time had incorporated that concern. And do you recall your testimony in response to that?

A. I can't say I remember it word for word.

Q. Fair. I'll read this back to you. You said: Into this plan right now in its current state,

no, we don't have that.

Do you have a reason to dispute that?

A. It's because we just hadn't developed the plan.

Q. Subsequent to your deposition rebuttal testimony was filed on your behalf and all other witnesses on or about February 10th of 2025. Do you have a reason to dispute that?

A. No. Sounds about right.

Q. Have you had a chance to review that rebuttal testimony in anticipation of today?

A. I've reviewed a bunch of testimony, so yeah.

Q. Is that a yes?

A. Yes. It was part of it that I reviewed, but there's been a lot.

Q. Would you agree with me there was approximately a two-month gap between your deposition and filing of that rebuttal testimony?

A. Yeah. It was what, December? So yes.

Q. Approximately?

A. Yeah, right. Dates blend together in my brain.

Q. It's okay to use your fingers.

Would you agree with me, then, that your rebuttal testimony does not address the Safe Drinking

Water Act?

A. We didn't put anything else in there to address that.

Q. Would you agree with me that your rebuttal testimony didn't address the topic of just the Hobbs Channel?

A. That is correct.

Q. And would also agree with me that your rebuttal testimony didn't address migration from the San Andres to the Hobbs Channel to the Capitan Reef?

A. That is correct.

MR. MOANDER: I'll pass the witness, Mr. Hearing Officer.

HEARING OFFICER HARWOOD: Rice?

MR. BECK: No question.

HEARING OFFICER HARWOOD: Mr. Suazo, for Pilot?

MR. SUAZO: No questions.

HEARING OFFICER HARWOOD: Okay. So this would normally be the point when we would turn this over to the Commission. Mr. Rozatos, let me bring you into the discussion on that.

It's 4:22 p.m. To me, that seems a little early to quit, on one hand. On the other hand, I want the Commission to be fresh and ready for

its questioning. What are your thoughts and what is the Commission's preference?

CHAIR ROZATOS: Ironically, Dr. Ampomah is smiling, so, to me, it is a little early, but I do want the commissioners to be able to have their questions answered. I don't think Dr. Ampomah is going to -- no offense, Dr. Ampomah, but I know you probably have a lot of questions. Mr. Lamkin probably has a lot of questions, as well. It may behoove us to you call it here and start fresh with questions in the morning.

Commissioners, how do you feel?

COMMISSIONER LAMKIN: I'm fine either way. It's up to whether or not Dr. Ampomah wants to get into it.

CHAIR ROZATOS: Dr. Ampomah?

COMMISSIONER AMPOMAH: Do you have any questions?

COMMISSIONER LAMKIN: I have a few.

COMMISSIONER AMPOMAH: Yeah, so he barely do have a few. Probably he can go through it and then I can start mine tomorrow morning.

CHAIR ROZATOS: Okay. So let's start with Commissioner Lamkin right at the moment, and then we can call it. And then Dr. Ampomah can start us in

the morning with his set of questions.

HEARING OFFICER HARWOOD: Sounds like a great compromise.

EXAMINATION

BY COMMISSIONER LAMKIN:

Q. Good morning, Mr. West. Thank you for testimony. I just have a few clarifying questions.

The east unit that you guys referenced in your testimony for the depths into the San Andres, do you know where that is on trend with the fairways previously mentioned by Dr. Lindsay?

A. Can you clarify?

Q. The flow paths of the meteoric water that were discussed.

A. Oh, that big --

Q. I think the Artesia Fairway was the fairway underlying the EMSU. I don't know if you know the other units that you referenced, that takes you along the same fairway or not.

A. Yes, it would have been on the fairway as you went up and across. I mean, because the whole fairway would extend all the way in the Guadalupe Mountains, all the way up on top of the Central Basin Platform to the other side.

Q. Right. But there were several different

flow paths, different fairways in those channels. I think maybe the San Simon system or something is the overarching name of the channel system, but there were several different fairways in the channel system?

A. I do vaguely remember the slide. Your memory is better than mine, I'd have to say. We could maybe be able to find it and bring it up.

Q. Well, I mean, if -- yeah, your answer would just be interpolating it off the slide, then?

A. That's correct. He's way more of a master of geology than myself.

Q. The next question I had was with regard to the precipitates that have been discussed, the sulfides in the San Andres water. Can that issue be mitigated by pretreating the chelating agents?

A. You can, you know, try to prevent the barium scale and different things by different chemicals, different chemistry. Most of the time you still end up with a little bit of it. Whenever it wants to form and bound, it's tough to totally get away from it.

We have treated in the field -- I can't remember the exact chemical makeup to help to try to prevent the barium sulfate. But it's a tough one, right? I'd much rather deal with calcium carbonate or something like that, where you can, you know, dissolve

easily.

Q. Thank you for that. On the slide that you guys showed, the radius of influence from the injection volumes from the Goodnight SWDs, do you know how you determined what those radii were?

A. So we took the perfs in there, and that's your, you know, net interval. And then we took the porosity, and that one is referenced. And then, you know, you would take out your 30 percent for your oil saturation, and then just did a, you know, 50 percent net to gross.

And then, you know, every barrel you put in, push another barrel. Right? So really, the outer circle is the influence right, because you pushed other fluid to there and so it's where it is. So, you know, this barrel pushes that barrel, so that's the structure of the way that it was built.

Q. So it was more mass balanced than anything empirically derived?

A. Yes.

Q. Okay.

A. And it's just a simple circle, right, to make the math easier.

Q. Some of those higher vertical permeability zones that have been discussed between the San Andres

and the Grayburg Formation, do you see those as being potential impediment to establishing a successful tertiary recovery project?

A. I think in the tertiary here, you're going to have vertical migration be part of it. And Mr. Melzer had one possible thing that we haven't looked to and would improve the economics, too, is the idea of a horizontal injector. So you could lay underneath a bunch and that would save a lot of cost, right? So you drill that, you lay it underneath the reservoir. You let it extend out and let it migrate up.

And I don't think in this field you can get away from the vertical fractures. It's a part of it. It's shown up on the core. Mr. Lindsey looked back at the RR Bell, too. It's got fractures all the way and down it, vertical fractures.

And so, you know, you're just going to have to engineer it into the factor, right? And I think one of the great ideas Melzer has, and some people are doing it, too, you just put it in, let it soak, it'll go out radially. But then you'll come up and catch it.

And in this reservoir, you've got around Zone 3 or 4, there's a real reference of a pretty good

high perm streak in the Grayburg, and that could be the top of everything. You could flood Zones 1 and 2 with water, and you could have that as the barrier, so you migrate things up to that catch. And since those have been the least swept, those would be where you would gather a good recovery of oil.

Q. So then the potential EOR project would utilize more of a huff and puff, rather than constant CO2 injection?

A. Not a huff and -- it would be a constant CO2 or a WAG.

Q. Well, then how would you create the soaking period if you were constantly pushing CO2?

A. Whenever you push, it's going to soak into it. So the idea behind the huff and puff is that you would pump it out into the formation, it would go into the oil, work on the viscosity or different things. And that's kind of your -- a little bit of soaking period, and you're letting it just -- you know, that pressure, you know, radial pressure, work its way out to the reservoir, right?

And then what you do is you turn it around after that distributes. Because its got to push through the rock. And you don't want to, like, blow back the pressure real quick. So that's kind of

the soaking. And then you would allow it to come back in, and hopefully it moves. You know, the idea behind it, it'll move that oil, it'll reduce the viscosity and would have pushed the oil out of the tighter pore throats into the bigger ones and allow it to come back into the wellbore.

Q. Okay. Let me see if that was -- oh, one other question I had. On the study that you did for the abnormally high water production volumes in the EMSU, was that data -- or I guess were those data points determined from publicly available data or was that from internal data supplied from XTO?

A. That was -- publicly and historically, there's a time frame in there where, I can't remember, where OC records go back to. There's part of it historically that brings you forward in a lot of documentation. I can't remember exactly, so it would be publicly -- data, you know, if you pieced together all the records, you could piece it together. I can't remember exactly. It's been so much data that I've worked through. But it's, you know, representative of that time.

Q. Okay. I think that's the last question that I have. Thank you.

A. Good questions. Thank you, sir.

HEARING OFFICER HARWOOD: Okay, folks. We'll give everybody a chance to rest their brains and their voices. Until tomorrow morning we'll be off the record, then, and reconvene promptly at 9 o'clock.

(Proceedings adjourned 4:32 p.m.)

AFFIRMATION OF COMPLETION OF TRANSCRIPT

I, Kelli Gallegos, DO HEREBY AFFIRM that on April 10, 2025, a hearing of the New Mexico Oil Conservation Commission was taken before me via video conference.

I FURTHER AFFIRM that I did report in stenographic shorthand the proceedings as set forth herein, and the foregoing is a true and correct transcript of the proceedings to the best of my ability.

I FURTHER AFFIRM that I am neither employed by nor related to any of the parties in this matter and that I have no interest in the final disposition of this matter.

April 28, 2025

Kelli Gallegos
VERITEXT LEGAL SOLUTIONS
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