STATE OF NEW MEXICO

ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

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

Oil Conservation Division's
Application to revoke SPC Resources,
LLC's Application for Permit to Drill
Caveman 402H Well. Case No. 22102

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

THURSDAY, SEPTEMBER 9, 2021

SANTA FE, NEW MEXICO

This matter came on for hearing before the New Mexico Oil Conservation Division, William Brancard, Hearing Examiner, Kurt Simmons, Technical Examiner, on Thursday, September 9, 2021, via the Webex Teleconferencing platform hosted by the New Mexico Energy, Minerals and Natural Resources Department.

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IN ATTENDANCE:

FOR TAP ROCK: Adam G. Rankin, Esq.

FOR MEWBOURNE AND MATADOR: James Bruce, Esq.

FOR ALPHA ENERGY PARTNERS: Michael Rodriguez, Esq.

C O N T E N T S

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SPC EXHIBITS:

WITNESS HANSON YATES

(Time noted 1:15 p.m.)

EXAMINER BRANCARD: So here we are, September 9, 2021, 1:15 p.m. We are going to resume the Oil Conservation Division hearings for today.

As I mentioned at the end of this morning we're going to skip ahead a little bit to Item No. 52 on the docket today under the worksheet that's provided on our website. This is our last case.

The applicant is the New Mexico Oil Conservation Division. After this case hopefully we will get to finish up Cases 48, 49 and 50 from OXY USA, and then Case No. 51 from Logos Operating -- if we get to them today. But there's always tomorrow.

With that can we start with some introdution of counsel.

Oil Conservation Division.

MR. TREMAINE: This is Jesse Tremaine, attorney on behalf of the Oil Conservation Division.

EXAMINER BRANCARD: Okay. And I have here as a party, SPC Resources.

MR. RANKIN: Good afternoon, Mr. Examiner. Adam Rankin from the law firm of Holland and Hart appearing on behalf of SPC Resources, as well as Tap Rock Operating, LLC.

EXAMINER BRANCARD: Okay. I'm not quite sure

how you can represent two people in this matter, but we'll find out.

I also have an Entry of Appearance from Alpha Energy Partners.

MR. RODRIGUEZ: Good afternoon, Mr. Examiner. This is Michael Rodriguez with Hinkle Shanor on behalf of Alpha Energy Partners, LLC.

EXAMINER BRANCARD: All right. Some of the pleadings seem to assume that there were entries from maybe Mewbourne and Matador, although I did not see any in the case file.

MR. BRUCE: Mr. Examiner, Jim Bruce.

Yeah, I did file entries of appearance; I don't know why they are not in there, but I am representing Mewbourne Oil Company and also Matador Production Company and MRC Permian Oil Company.

MR. TREMAINE: Excuse me, Mr. Examiner. In reviewing the pleadings before the hearing, I believe that Mr. Bruce's filing transposed a portion of the case number.

MR. BRUCE: Ah. Okay. Thank you.

MR. EXAMINER: Ah-hah.

MR. BRUCE: (Inaudible) wasn't showing up. Okay.

EXAMINER BRANCARD: All right. So, Mr. Bruce,

you're representing Mewbourne and Matador; is that correct?

MR. BRUCE: Yeah, Matador plus their sister company MRC Permian Company.

EXAMINER BRANCARD: Okay. And Mewbourne.

MR. BRUCE: Correct.

EXAMINER BRANCARD: This is not our usual type of case where there's lots of parties entitled to Notice and therefore entitled to become a party upon an Entry of Appearance, so I guess I'm wondering a little bit about the status of these parties that have filed Entries of Appearance here.

Mr. Bruce, are you attempting to title yourself as a party in this proceeding?

MR. BRUCE: Mr. Examiner, Mewbourne and Matador, et al., own interests in the area. We are interested parties. We are not going to take part in the hearing. I mean, we are not going to actively participate in the hearing.

EXAMINER BRANCARD: Okay. That's helpful.

You could always file a Motion to Intervene if you need to.

MR. BRUCE: Correct.

EXAMINER BRANCARD: Sorry to give you something else to do.

MR. BRUCE: I will do so, but we are simply interested in this application.

EXAMINER BRANCARD: Thank you.

Mr. Rodriguez, Alpha Energy Partners.

MR. RODRIGUEZ: Similar to what Mr. Bruce was saying, Alpha Energy Partners is also an interested party and owns interests in the surrounding acreage. And Alpha does not intend to call any witnesses or present any evidence. It's strictly (inaudible) in this case.

EXAMINER BRANCARD: Okay. Mr. Rankin, in your other role as Tap Rock counsel?

MR. RANKIN: Same situation, Mr. Brancard. Tap Rock is intending to just observe from the sidelines at this point.

EXAMINER BRANCARD: All right. That's helpful. Thank you very much.

Mr. Tremaine, what is your -- as the Applicant here you would be going first. What is your plan for today? Would you like an opening statement and then tell us how many witnesses you have? You have prefiled Direct Testimony, so tell us what your plan is for today.

MR. TREMAINE: Absolutely, Mr. Examiner. I can provide a brief opening statement and give you an outline for witnesses and our expectation for timing today.

So as a brief background, the Oil Conservation Division filed this application to revoke Amended Order R-21096 and referenced APDs after the expiration of an Emergency Order issued previously by the Oil Conservation Division. That Order barred drilling and completion of SPC'S planned Caveman 402H well.

OCD has spent over a decade and tens of millions of dollars in attempts to stabilize a cavity in place of the former Carlsbad brine well. Due to conditions at the brine well, which our first witness Mr. Jim Griswold will testify about, the area represented has potential, previous potential for catastrophic failure, which would impact critical infrastructure and water resources in a developed area in and around Carlsbad, New Mexico.

The OCD's review of the area and current ongoing proposed oil and gas operations in the vicinity has evolved over time due to substantial changes in the understanding of the Carlsbad brine well project, particularly since late 2019.

You will note as we move through the exhibits and the testimony that we will demonstrate that more recent information related to the cavity's known void space, the settling of backfill material, and possible impacts of acute and cumulative seismicity events create a

current context in which the cavity may not be capable of tolerating impacts from the oil and gas activity, either currently pending or proposed, which I previously referenced.

So today the Oil Conservation Division seeks an Order revoking the Amended Order and APDs to allow -- the purpose of which is to allow sufficient time for completion of the brine well stabilization project.

The parties were or are unable to resolve this matter prior to hearing; however, I will note for the parties' benefit, and Mr. Hearing Examiner your benefit, that OCD does take note of SPCs Prefiled Testimony outlining an alternative of suspension rather than revocation, and amendment of existing conditions.

While we are not able to settle this case without hearing, OCD has taken that recommendation or that alternative proposal into consideration and may seek to propose a Final Order following this hearing. That remains to be seen after the hearing.

So lastly I just want to clarify that the Oil Conservation today seeks an Order which makes clear that both drilling and completion operations, whether regarding horizontal wells, vertical wells, regardless of the producing formation, are all prohibited until further Notice or approval by the Oil Conservation Division.

So today the Oil Conservation Division presents two witnesses. The first is Mr. Jim Griswold, a Special Projects Manager for OCD. We will attempt to complete his testimony in approximately half an hour. His direct, at any rate.

The second witness is Mr. Mike Rucker, who is a Senior Associate Engineer with Wood Environment Infrastructure Solutions. Wood is the contractor managing the remediation project for OCD at Carlsbad brine well.

Also we intend to complete his direct testimony in approximately half an hour. The goal will be to adopt and admit the Prefiled Written Testimony for both witnesses and then move through Direct as efficiently as possible, referencing and explaining the exhibits primarily, and again attempt to complete those witnesses combined in approximately an hour.

EXAMINER BRANCARD: Thank you. So will your witnesses be responding to SPC's alternative, or do you want to respond in some post-hearing fashion?

MR. TREMAINE: At this point, Mr. Hearing Examiner, we would prefer to respond in some form of Post-Hearing filing.

EXAMINER BRANCARD: All right. Thank you.

Mr. Rankin, what are we expecting from you today?

MR. RANKIN: Mr. Brancard, we have one witness who, has Prefiled Testimony and exhibits, and we intend to provide a short summary of his testimony, which I expect to take approximately 20 minutes, but no more than half an hour.

EXAMINER BRANCARD: Thank you. Would you like to summarize your position?

MR. RANKIN: Mr. Brancard, our position, I think, is adequately summarized in our Prehearing Statement, so rather than take up any time with that, I'll just stand on the statement that we submitted Thursday in our Prehearing Statement.

EXAMINER BRANCARD: All right. So can I get both parties to agree that you will not object to each other's Prefiled Testimony and then we can use those?

Tremaine EXAMINER BRANCARD: You will get the opportunity to ask questions, but I'm just saying the testimony itself.

MR. RANKIN: No objections to the Prefiled Testimony of OCD's first two witnesses.

MR. TREMAINE: And no objection to SPC's Prefiled Testimony.

EXAMINER BRANCARD: Okay. So noting that you have Prefiled Testimony, then you don't have to repeat everything in the Prefiled Testimony. That's why we ended

up going long this morning.

Please move ahead, Mr. Tremaine, with your witnesses. Can we swear both of them at first together?

MR. TREMAINE: Yes. And both are here.

Jim Griswold and Mike Rucker, please confirm that you are here and available.

MR. GRISWOLD: Can you hear me?

MR. TREMAINE: Yes.

EXAMINER BRANCARD: Mr. Rucker?

MR. RUCKER: I'm Mike Rucker.

EXAMINER BRANCARD: Good. Everybody sounded clear. Let's try raising our right hands here.

Do you both solemnly wear the testimony you're about to give is the truth and nothing but the truth?

Mr. Griswold?

MR. GRISWOLD: I do.

EXAMINER BRANCARD: Mr. Rucker?

MR. RUCKER: I do.

EXAMINER BRANCARD: Excellent. Please proceed, Mr. Tremaine.

MR. TREMAINE: Thank you.

JIM GRISWOLD,

duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. TREMAINE:

Q. Good morning, Jim. Could you please state and spell your name for the record.

A. My name is Jim Griswold, spelled J-i-m, last name G-r-i-s-w-o-l-d.

Q. And you are testifying on behalf of the OCD today?

A. Yes, sir.

Q. And you filed Prefiled Written Testimony in this case?

A. Yes, I did.

Q. And do you adopt that Prefiled Written Testimony today?

A. Yes, I do.

Q. Would you please provide a summary of your education and experience.

A. In terms of education, I attended both the University of New Mexico and New Mexico Tech. I graduated with a general studies degree, actually was studying physics, had gotten a job in the oil patch, and had enough hours so off I went.

In terms of experience, as I mentioned I started in the oil and gas sector, OH, within the early 1980s as a geophysical logger, first in Hobbs, New Mexico, and then over in Sonora, Texas. Did that for several

years.

A downturn in the industry led me back to New Mexico, where for about seven years I was a principal in an R&D company here in Albuquerque researching post power techniques.

Thereafter is when I, in essence, kind of began a career in environmental science. The first project I actually did was a groundwater model of the Jemez Basin out here in the northwest of Albuquerque, but then gained a lot of experience over several decades with the characterization and remediation of spills and such around storage tanks for corner gas stations.

In 2008 I came to work for the OCD, initially as a senior hydrologist. After probably about I guess six years or so with the Division, I became Environmental Bureau Chief, served in that role for five or so years, and since 2020, I have been a special projects manager for the Division.

And since 2009 I have been the principal for the Department and the Division on the Carlsbad Brine Well Project.

Q. Let's clarify to make sure I heard that correctly. Is that since 2004 you've been that principal for the Carlsbad Brine Well Project?

A. No, actually since 2009. I'm sorry. In terms

of the Carlsbad project.

Q. I didn't hear that. Thank you.

I draw your attention to what is labeled as Griswold Exhibit 1. Is that your Curriculum Vitae.

A. Yes, it is.

Q. And you created this exhibit?

A. Yes, I did.

Q. And how many total years do you have in terms of experience dealing with the Carlsbad brine well?

A. Twelve.

MR. TREMAINE: Okay. At this point, Mr. Hearing Examiner, I would move admission of Griswold Exhibit 1 and tender Mr. Griswold as an expert in the area of the Carlsbad brine well.

MR. RANKIN: No objection from SPC.

EXAMINER BRANCARD: Thank you, Mr. Rankin. The exhibit is admitted and Mr. Griswold is accepted as an expert.

MR. TREMAINE: Mr. Hearing Examiner, I intend to reference each of Mr. Griswold's remaining exhibits and then move their admission after explanation of all of them, to try to move through here.

Q. Mr. Griswold, I would draw your attention to what's been labeled Griswold Exhibit 2. Did you create or compile this exhibit?

A. Yes, I did.

Q. And what is it?

A. It's an application from SPC Resources for compulsory pooling.

Q. Okay. And is it fair to say that this exhibit serves the purpose of providing background information on the affected area and the affected acreage for the Caveman project?

A. Yes, it does.

Q. Moving on to Griswold Exhibit 3, same questions. Did you create or compile this exhibit?

A. I compiled it.

Q. What is it?

A. It looks like it's an amended -- excuse me. It is the Order following the Application that was Exhibit 2.

Q. Okay. What's labeled as Griswold Exhibit 4, did you also compile this exhibit?

A. Yes, I did.

Q. And is it accurate to say this is First Amended Order, Amended Order of the previous Order?

A. Yes, it is. And you can, tell that by the Order number, as in the letter A appended to it.

Q. Thank you. Same questions for Exhibit 5. Did you compile this exhibit?

A. Yes, sir, I did.

Q. And this is second Amended Order?

A. Yes, it is.

Q. And is it safe to say for Exhibits 3, 4 and 5 that the purpose of these exhibits is just to provide the background information related to the affected acreage?

A. Yes, it is, sir.

Q. Thank you. I will draw your attention to what is labeled Griswold Exhibit 6. Did you compile this exhibit?

A. Yes, I did.

Q. What is this exhibit?

A. This is an application for permission to drill for one of the wells associated with that compulsory unit that we discussed in the prior exhibit.

Q. And this exhibit provides the information about the surface hole location and laterals?

A. Yes, it does.

Q. Thank you. I'll draw your attention to Griswold Exhibit 7. Did you compile this exhibit, as well?

A. Yes, I did.

Q. And what is it?

A. That's a Summary Notice from SPC changing the name of that well.

Q. The purpose of this exhibit is to provide clarification as to the wells in question?

A. Yes.

Q. Naming them. Thank you.

I will draw your attention to Griswold Exhibit 8. Did you create this exhibit?

A. Yes, sir, I did.

Q. And what is it?

A. It's an aerial image of a portion of the southern portion of Carlsbad it shows not only the location of the brine cavern that we're trying to fix but also generally speaking the approximate location of the laterals for the two wells. As we see there's plenty of drilling in the spacing unit.

MR. TREMAINE: And I guess I should have asked, Mr. Hearing Examiner, if it's all right to share certain of the exhibits, as I reference them.

EXAMINER BRANCARD: Okay. I didn't realize you had the authority, but sure.

MR. TREMAINE: I can proceed by question, but I thought for this one I might share it. It seems to have let me.

EXAMINER BRANCARD: Please proceed.

MR. TREMAINE: Thank you.

Q. Mr. Griswold, can you please describe on Griswold Exhibit 8 the location of the brine well relative to the location of both the surface hole location of the

two proposed wells and the laterals?

A. Okay.

EXAMINER BRANCARD: Mr. Tremaine, I think we are looking at Mr. Rucker's testimony right now.

MR. TREMAINE: Well, that doesn't work.

Q. Is it visible now?

A. Yes.

Q. Okay. Thank you. I'll keep these on this screen.

So back to my question, Mr Griswold. Can you please just orient us to the location of the brine cavern, the surface hole locations for the referenced wells, the laterals, and the relative distances between those points.

A. Certainly. The brine cavern project itself is in the lower-right-hand corner of the aerial image there, and it's labled "Brine Cavern". That's the south-lying Carlsbad, intersection of 62/180 and US 285.

The two red lines you see going laterally across the diagram are the approximate locations of the laterals associated with two proposed oil and gas wells. The upper one labeled Caveman 402H, the surface location would be on the east end, which would be the right-hand side, and then the final bottomhole location would be to the west on the left-hand side.

So basically what I just did was plotted those two points and connected the dots, so to speak, and that's why you see that red line, which would suggest where that lateral would be.

The same thing goes for the next red line below it, the Caveman 7 12 WCD3H. So its surface location is situated a little bit further east than the 402H but extends about the same distance westward.

The distance closest approach to the brine cavern for both those wells is approximately 1700 feet -- or excuse me, 17,000 feet.

Q. Thank you. While we are on this slide could you please, at a very high level, describe the development that you see on this map, on this exhibit, which overlies the brine cavern.

A. This is within the City limits of Carlsbad, so there's a mixed use across that area. There's residential, there's commercial, there's the highways I mentioned. You can kind of see it snake across the image from the upper left to the lower right. It is the Carlsbad Irrigation District main canal.

So it's basically like a developed portion of Carlsbad.

Q. All right. Thank you very much. Stop sharing.

And Mr. Griswold I would draw your

attention to, looks like Griswold Exhibit 9. Did you compile this exhibit?

A. Yes, I did.

Q. And what is it?

A. This is a letter from SPC to the Division stating their intention to drill, proceed with the Caveman 402H.

Q. And while we are here, without getting into too much detail, when did you -- on what date did you first become aware of oil and gas activity of any kind which you believed could pose a threat or an impact to the Carlsbad brine well?

A. April 14th of this year, 2021.

Q. And is it accurate to state that the letter which is Exhibit 9 represents the date on which you became aware of the SPC wells which we referenced?

A. Yes, it did.

Q. I'm sorry. What was that?

A. Yes, it would represent the day that I became aware. June 7th.

Q. Okay. I want to draw your attention to Griswold Exhibit 10. Did you compile this exhibit?

A. Yes, sir, I did.

Q. What is it?

A. That's an Emergency Order from the Director of

the Division to SPC to suspend drilling of the Caveman 402H.

Q. And I want to draw your attention to the last exhibit, Griswold Exhibit 11. Did you compile this exhibit?

A. Yes, sir, I did.

Q. What is it?

A. It's the application or permit to drill for the second well, the Caveman 7 12 WCD 3H.

Q. And the purpose of this exhibit is to provide background information about the surface hole location and lateral extent of the second proposed well?

A. Yes, it is.

MR. TREMAINE: Okay. Thank you.

Mr. Hearing Examiner, after moving through those, I would move to admit Griswold Exhibits 1 through 11.

EXAMINER BRANCARD: Mr. Rankin?

MR. RANKIN: No objections.

EXAMINER BRANCARD: All right. Those exhibits are admitted.

Q. Mr. Griswold I have a couple of general questions for you related to the brine well and the general history of it.

You had just referenced that you became

aware of oil and gas activity that you felt could threaten the integrity of the brine well remediation project in April of this year. What was that activity that you became aware of.

A. I received a phone call, if I remember correctly, from an inspector down in that part of the state telling me that a well had recently been drilled and completed in proximity to the brine cavern. It wasn't either of the SPC wells we are talking about here, it was another operator. And the surface location there was probably about a mile southeast of the brine well location.

Q. Did that notification trigger any follow-up or review of other current or proposed activity in the area?

A. Yes, it did.

Q. And you had indicated that the June letter was the first time in which you became aware of the particular SPC wells which we are here about today?

A. Yes.

Q. Okay. All right. In looking at these exhibits is it fair to say that you are generally familiar with the acreage affected by the Caveman project?

A. Generally, yes, I am.

Q. Is it also fair to say that based on your understanding of the brine well and within the affected

acreage, that you would have concerns for the stability of the cavity regardless of the orientation of those wells within the affected acreage?

A. Yes, I would have concerns.

Q. And same question: Would you still have concerns if SPC accessed a different producing formation?

A. Yes, I still would.

Q. So if they changed those from horizontal wells to vertical wells or they moved from Bone Spring to Wolfcamp or vice versa, some other producing formation, the same concerns as outlined in your Direct Testimony would remain?

A. Yes, they would, because the proximity of that activity would be the about the same as we see now.

Q. Could you please describe the -- briefly describe the current state of the remediation project.

A. We paused backfilling operations on the project in July, at the end of July of 2020, due to insufficient funding. We recently, in the last legislative session received additional funds to reinitiate backfilling operations. We are in the process now of finalizing an amendment to the contractor's contract, Wood. That amendment has to be agreed to by the Carlsbad Brine Cavern Mediation Authority. Our meeting is scheduled for the 21st of this month to do just that.

Anticipating their approval, we have begun remobilization to the site, hope to get started this month. If we can realize the sand injection rates going ahead that we had seen in the prior operations, it is our hope that we would be done backfilling probably in the spring of 2022.

Q. Just for clarity, I'm going to reference the direct, the Prefiled Written Testimony.

The reason -- uhm, the reason that Wood is currently undergoing a sand backfill is because in late 2019 you discovered a previously unknown void space; is that correct?

A. Yes, it is. If you would like me explain the situation, I can.

Q. Well, let me ask the question a different way.

When was that void space detected?

A. December of 2019.

Q. Okay. And that's at the north end of the brine cavity?

A. Yes, sir.

Q. And that's directly under, approximately under Highway 285?

A. Yes, it is.

Q. Okay. And that discovery precipitated a change in the backfill approach?

A. Yes, it did.

Q. Okay. Did you also -- in managing this project, did you also later discover an unexpected rate of settling of sand?

A. Yes, it did. It's going to require more sand to backfill that void in this northern portion than we had originally anticipated. That was the reason why we had run out of funding in July of 2020. Prior to that we were hoping to get it done, but we were wrong.

Q. So the previous change that you had mentioned, this restarting, that's the recalibrated plan, to go back and fill with additional sand, which required more funding?

A. Yes, it is.

Q. And remind me again when that's expected to start.

A. Hopefully here this month of September, 2021. If not September then October.

Q. Okay. And then you had indicated a projected completion date in the Spring of 2022. Did I hear that correctly?

A. Yes, that's a projection on my part.

Q. Okay. Are there any other next steps in this project that as the manager you believe are critical for the hearing examiner?

A. Yes. The next field step is to run what is known as a sonar log of that northern void. We ran a log right after we paused injection operations back in July of 2020, so we had a good idea of what the void looked like at that time. It's been better than almost a year and a half, year and a couple of months, so the first step will be to rerun a new log to see if mud -- if anything has changed in the intervening time.

Q. Okay. And in terms of the -- you know, the project completion, what does it look like to you when -- what does a completed remediation project look like?

A. I can't get any more sand into the cavern.

Q. And just to be clear, that point is the same point as your currently projected completion date?

A. Yes.

Q. Okay. Is it -- based on your Prefiled Written Testimony and our discussion of the -- and your knowledge of the brine cavern, is it fair to say that your opinion is that any proposed or potential drilling or completion activities within the affected acreage could jeopardize the integrity of the brine cavern?

A. Yes, that is my position. Or concern.

Q. And if and when -- I should say when the remediation project is completed and you can't fit any more sand into the cavity, do you believe that the

completion of that project, barring any other unforeseen events, would alleviate concerns you have related to drilling or completion activities in the area?

A. No promises, but that is the hope.

MR. TREMAINE: Okay. And I apologize, they are drilling, doing construction in the office here, so please let me know if that interferes.

Mr. Hearing Examiner, at this time no more questions for Mr. Griswold.

EXAMINER BRANCARD: Thank you. Let's proceed with Mr. Rankin.

MR. RANKIN: Thank you very much, Mr. Examiner.

Good afternoon, Jim. How are you today?

THE WITNESS: Just fine, Adam.

MR. RANKIN: Good. I just have a couple of questions.

BY MR. RANKIN:

Q. I appreciate your review of the timeline for the remediation work. It sounds like it hasn't yet started. Is that right?

A. No, it's not yet started.

Q. And it won't start until this sonar log is taken?

A. Well, nothing will really start in the field until I get an amended contract in place, but, like I

said, once that amendment is in place the next step will be to re-enter the well we used for injection of sand, and run a sonar log in the cavern. Hopefully things will be fairly much the same as we left them, and at that point we would start re-injection of sand.

Q. So still waiting on an amended contract with Wood to complete this phase of the project?

A. Yes. But it's -- I mean, it's on the verge of having that contract agreed to.

Q. The next step would be, then, to conduct that sonar study?

A. Yes.

Q. So that has not been scheduled yet, the sonar itself hasn't been scheduled yet?

A. No, sir, it has not.

Q. And my understanding is, just so I'm clear, that the Division, or your understanding of when remediation work will be completed is when no more sand can be feasibly injected into the void space. Is that correct?

A. Yes.

Q. Not that there's some process following that point. The remediation is complete when it will no longer accept sand, or when (inaudible) sand is injected.

A. Yeah. Given the way that the injection wells are configured now, that would be the case.

Q. Is there something that might change or would change that down the road in terms of when the remediation work is complete?

A. Not likely, Adam.

Q. Sitting here today, can you think of anything that might cause the remediation work to not be -- not be complete when it's no longer able to receive additional sand?

A. Well, assuming that the cavern is pretty much how we left it, that would be the case.

Q. Okay. Now, on the resumption of oil and gas activities, I think I understood your testimony that once that remediation work is completed, once the cavern is no longer able to feasibly receive additional sand, then the concerns about impacts to the cavern from oil and gas activity would be addressed. Is that right?

A. They would certainly be greatly diminished at that point.

Q. But sitting here today you will say that the Division at that point would be ready to approve the resumption of oil and gas activities within the Caveman Unit?

A. Well, that would be -- is kind of beyond my pay grade. It would be a Division decision, and I would have input into that decision.

Q. But sitting here today you can't say whether the Division would be able to confirm that oil and gas activities could resume at that point?

A. No, I can't. I can't guarantee it.

Q. And after having the sonar log results back, would you have a better idea of some of the factors that would -- might affect the Division's consideration of whether remediation would be completed at the time the cavity is filled with sand?

A. That would be reasonable to assume.

Q. In other words, is that a yes, then?

A. Yes. I'm sorry.

Q. That's all right. All right. Can you say, Jim, whether or not -- you know, the Division's analysis for when oil and gas activities can resume in the Caveman Unit, would it be the same factors, that same analysis that would apply to other oil and gas activities near the brine well.

A. Yes, it would.

Q. So, in other words there wouldn't be much of a difference in terms of how far away a well was within a certain area. I mean, it's going to be the same factors that are going to be considered by the Division whether any oil and gas activities should be permitted to proceed near the brine well?

A. Yeah. It's still that area of potential effect that we are looking at currently.

Q. Just so I'm clear, is there a specific area that the Division is evaluating as an area of concern?

A. Yes, there is, but I couldn't tell you the exact extent of it, Adam. My role as project manager is trying to get this brine cavern fixed. That discussion regarding the potential area of concern is being handled by others in the Division.

Q. Okay. So you're not aware of exactly what that is.

A. No, I'm not.

Q. Now, look at -- in your testimony you testified about this, and I just want to just understand a little bit.

But from April 14th -- well, let me step back.

Actually, in your testimony you talked about SPC filed its APD and was approved by the Division in November of 2020. Is that correct?

A. Looking back at the exhibit, I think you're correct.

Q. Okay.

A. That would be Exhibit 3, and the date of the Order is February 12th, 2020.

Q. Okay. And then you discovered through that phone call with an inspector that there was some horizontal wells in the vicinity of the brine well in April of 2021.

A. Yes.

Q. And then following that you became aware of SPC's proposed plans in June of 2021?

A. That's when I became aware of SPC's plan.

Q. Right. So what -- so something happened between November of 2020 and, say, June of 2021 that caused the Division, it appears, to take a different position or stance with respect to oil and gas activities around the brine well.

What happened? If you can explain, just give us an idea what happened during the interim that caused the Division to changes its position regarding oil and gas activity around the brine well.

A. Well, in terms of actual permitting and applications like compulsory pooling stuff, again that's not my ball of wax, in essence, within the Division. But as I was alluding to before, in the late winter of 2019 during the course of the backfilling project when we discovered the void, that was actually an indication that the cavern had previously failed catastrophically, it just hadn't propagated itself all the way to surface.

So we knew at that point we had, in essence, a more dangerous situation and more immediate situation on our hands.

Q. Okay. And that was the winter of 2019. Then since that time was there more information that the Division learned that caused increasing concern to cause it to change its position with respect to oil and gas activities around the brine well?

A. Not increasing, Adam, no.

Q. So from the winter of 2019, so when you learned of the horizontal wells within the vicinity, there's nothing that really changed in the world, fact-based or information-based, that caused the Division to change its position?

A. No.

Q. Okay.

A. At least not from my point -- not that I'm aware of.

Q. Is it just you became aware that the wells, more wells were being drilled in close proximity to the brine well?

A. It's not the SPC wells, but actually two of the planned wells in this area, the laterals went right underneath the cavern.

Q. And what was the Division's response at that

point?

A. I guess I'm not sure what the question is.

When we discovered that there was planned drilling and completion activities in the proximity of the well?

Q. Yeah. Yeah.

A. My understanding of it is that -- because within the Division they began talking to those operators.

Q. Now we will move on to -- Mr. Griswold, have you had a chance to review SPC's testimony that was submitted in the case?

A. No, I have not.

Q. Are you familiar with the -- so you're not familiar with any of the testimony that was offered by SPC?

A. No, I am not.

Q. Okay. In the Division's Application -- do you have that in front of you by any chance?

A. Yeah. The Application for this hearing?

Q. Yes. And I'll just (inaudible) the Amended Application I'm referring to.

A. No, I don't have it, but if you have got it I guess you could put it up on the screen.

Q. Okay. If I can get that real quick.

Let me know when you can see my screen.

A. I can see it now, Adam.

Q. Great. So there are a couple of places in the Amended Application where, you know -- originally the Division had proposed temporary suspension of SPC's proposed drilling and completion activities. In, particular, in paragraph 26, the Division does say that it has requested and SPC refused voluntarily to temporarily to suspend its drilling and completion activities.

Then in paragraph 28, again the Division requested and SPC refused to temporarily suspend its proposed grilling activities.

Then also in paragraph 33, with respect to the second proposed well, the Division asked again whether SPC would agree to temporarily suspend its plans to drill and complete.

Do you see that in the Application, the Amended Application?

A. Yes, I do.

Q. So from the Division's perspective, or from your perspective, I would say, would a temporary suspension of SPC's Pooling Order and its associated APDs -- it was originally the Division's plan or proposal to temporarily suspend those Orders and APDs. Wouldn't such a suspension achieve the Division's goals at this point?

A. Yes, if that suspension was until we felt that

the cavern had been stabilized.

Q. So an order that would effectively suspend for a period of time until the Division approves -- confirms that the remediation work is complete and oil and gas activities can resume would achieve the Division's goals in this case?

A. It would be acceptable to me. As I said, I can't speak for the Division as a whole on what other factors may go into such a decision, but that's what's driving me.

Q. But there is nothing, sitting here today, you can think of that you would be able to distinguish between a temporary suspension that prevents any drilling and completion activities until the Division approves, such as a revocation? Is there any distinguishing difference between the two, at least in terms of the Division's goals of preventing drilling and completions within the affected area?

A. Not with the data set in front of me now, no.

MR. RANKIN: Okay. I think that's it, Mr. Examiner. I have no further questions and appreciate Mr. Griswold's time and willingness to sit here.

EXAMINER BRANCARD: Thank you. Mr. Simmons, any questions?

EXAMINER SIMMONS: No, none at this time. Thank

you.

EXAMINER BRANCARD: Let me just ask one or two questions.

CROSS EXAMINATION

BY EXAMINER BRANCARD:

Q. Mr. Griswold, knowing the status of your proposed contract amendments in the proposal there, starting on the beginning of operations where Wood would be injecting fill into the void, how long is the estimate that it would take to complete?

A. The intent right now, or the objective in front of us, is to inject just over 76,000 cubic yards of sand.

We have achieved in the past a sustainable injection rate of about 800 cubic feet a day. So if I divide 76,000 by 800 -- I think it's 90, but let's make sure. (Note: Pause.) It's 95 pumping days.

Q. Are they going five days a week or seven days a week?

A. Presently we are built around a five-day a week schedule due to Covid restrictions and some of our crews travel from out of state and cause some problems.

But if we can effectively and efficiently go back to a 24/7 schedule where we really originally started, we will.

Q. Okay. So if I do my math correctly here, we're

talking about 19 weeks on a five-day.

A. Yes.

Q. Okay. And your testimony about becoming aware of a failure in the cavern in late 2019, is that the reference in your Written Testimony to sonar logging that showed a cavern failure perhaps as much as 20 years ago?

A. Well, the sonar log actually confirmed it. When we first became concerned is in the drilling program, uhm, when we actually lost what we refer to as weight on bit. We ran into an open void that we didn't expect. It was pressurized with gases and water -- or brine, I should say. And we drilled several holes, saw the same result, decided to pull the sonar log and take a look, and that's when we confirmed the extent and size of the void.

Q. Okay. In other words, the drilling found a hole where it wasn't supposed to find a hole.

A. Correct. The assumption going in previously was that cavern was kind of almost dominated by undissolved materials that were unconsolidated. So there would be insoluble materials and lot of it still being salt.

So initially what we were intending to do was inject grout into those spaces to consolidate that material and therein provide structural stability.

We started south to north in that project. We began in September of 2019, and in those southern

portions it worked. We encountered material that we expected, and the grouting procedure worked as anticipated. We were progressing on, so we actually think that the areas in the southern part of the site are stabilized such that the irrigation canal, a trailer park that exists beyond it, and a church property off and to the immediate east are probably out of danger. However, these areas further north, not the case.

EXAMINER BRANCARD: Thank you. Mr. Tremaine, any redirect?

MR. TREMAINE: Yes, briefly.

REDIRECT EXAMINATION

BY MR. TREMAINE:

Q. Mr. Griswold, I want to clarify your answer to a question of Mr. Rankin's about kind of how the Area of Review, how that's changed.

Are you generally aware that your supervisors in OCD leadership are reaching out and communicating with operators in the area?

A. Yep.

Q. But you are not personally taking part in those communications?

A. No, I'm not.

Q. So you don't have firsthand knowledge of the content of those communications, but you're generally

aware?

A. I do not have any firsthand knowledge.

Q. Are you generally aware that those discussions involve a current three-mile radius of concern?

A. I can't say a three-mile is exactly what they are talking about, but it seems reasonable. In the very earliest portions of this I think we initially just said: Okay. Tell me every well, planned or existing, within five miles of the brine cavern.

Q. Okay. So that when you -- as you were first working on the response to the realization there was ongoing activity in the area, you first looked at or started to look at an area of five miles?

A. Yes.

Q. Okay. I also want to clarify your response to anything that's changed since December, 2019.

The two sonar logs that have taken place, am I correct that they both occurred in 2020?

A. Yes. Actually, there were three in 2020.

Q. Could you describe the dates that those sonar logs occurred?

A. The first one, if I'm remembering correctly, Jesse, was in January of 2020, and that was the one confirming that we had a void, and where it was and how big it was.

I want to say a second set of logs was run in March of that year as a check. We had already started backfilling the sand. It was a progress check on the cavern, and that's when we became aware that we were losing a fair bit of the sand that we were injecting into -- it was infiltrating into a rubble pile at the bottom of it.

Then the third sonar log -- actually it wasn't March, it was May.

The third and final sonar log was in July after we stopped injection operations to get a photograph of what the status of the brine cavern was when we were pausing operations.

Q. So based on your response it sounds like there actually was additional information related to the progress of the backfill project relative to what you had anticipated. Is that correct?

A. Yes.

Q. The sand was settling much faster and to a greater extent than you had anticipated?

A. Yeah, a significant percentage of the sand we were introducing.

Q. Do you recall the percentage of sand lost to settling?

A. I want to say it was in the order of about 60

percent. But that will decrease over time, and our hope is that we kind of may have met that criteria at the time we stopped pumping in July. So things will hopefully go a lot quicker and we will see more progress, hopefully.

Q. So is it then fair to say there was also substantial and significant new information that related to the remediation project's progress that you acquired throughout 2020?

A. From early 2020 to July when we paused operations, yes.

MR. TREMAINE: Okay. Thank you. No further questions.

EXAMINER BRANCARD: Thank you. I think we can move then -- do you have another witness, Mr. Tremaine?

MR. TREMAINE: Yes, sir. The second witness is Mr. Mike Rucker.

MICHAEL RUCKER, PE,

duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. TREMAINE:

Q. Good afternoon. Switched to afternoon. Could you please state your name and spell your name for the record.

A. My name is Michael Rucker, M-i-c-h-a-e-l, Rucker, R-u-c-k-e-r, and I go by Mike.

Q. Are you testifying on behalf of the Oil Conservation Division today?

A. Yes.

Q. Did you submit Prefiled Written Testimony for this matter?

A. Yes, I did.

Q. And do you adopt your Written Testimony today as your sworn testimony?

A. Yes.

Q. Could you please provide a summary of your education and experience.

A. My education -- well, my Bachelor's degree in civil engineering from MIT, Massachusetts Institute of Technology. I got my Bachelor's degree in '76 and then I went back and got my Master's degree from MIT in 1980.

Upon completion of my Master's I started work with Searching (phonetic), Hoskins and Beckwith Engineering, which have been acquired by other companies, until I am now -- I now work for Wood, even though the last time I filled out a job application was Christmas break of 1979.

So I've been a practicing geotechnical engineer with what is now Wood for 41 years.

My focus as a civil engineer has included a lot of engineering geophysics, and in my early days

actually I did a lot of vibration monitoring work, also. Now decades later I'm suddenly finding that experience to be useful.

Q. Great. Thank you.

Could I direct your attention to what's labeled as Rucker Exhibit 1.

A. Yes.

Q. Is this your Curriculum Vitae?

A. Yes, it is.

Q. Or I guess you may have labeled it -- okay.

And so just overall you have a total of 41 years of experience in geotechnical engineering, correct?

A. In geotechnical engineering. And that's once I had my Master's. I had a couple of years of experience in between including a mercifully short time with Schlumberger in Monahans in 1976, a little time in the subway tunnels of Washington DC when that was under construction.

And then as a student intern with the Arizona Department of Transportation when I was an undergraduate.

Q. Okay. Thank you.

Remind me what is your current position title with Wood, and please describe how it relates to the Carlsbad brine well.

A. I'm a Senior Associate Geotechnical Engineer, and currently for the Carlsbad brine well probably I'm the instrumentation manager, although I've been associated with this project -- I believe I had my first phone conversation with Jim Griswold in 2009 on this, and 2010 working for the New Mexico DOT we did surface seismic around the perimeter of the site, checking to make sure that there was not incipient ground cracking which could be a precursor to collapse, which would have impacted Highway 285.

When what was then AMEK (phonetic) were awarded the work for -- we were retained to do the feasibility study in 2012 for the remediation of the facility, and I was central to the interpretation and analysis and synthesis of the geophysics, primarily the surface geophysics that had been done to try to characterize the site, and then upon completion of that feasibility study continued on participating in the instrumentation monitoring, microseismic -- an initial microseismic system had been installed and operational by 2014. I've been involved with that since the beginning.

As we came into being retained to do the remediation, I've been intimately involved with that work. I've seen every foot of core that's come out of the core holes to the enhanced microseismic system.

I personally oversaw the geophysical logging that was done for those wells to increase our knowledge, in that every hole drilled, it may have been an instrumentation hole, it may been a production hole, but it still was an exploration hole. And that goes for the whole GW 4 that hit the 84-foot of open void that early morning. I think it was the early morning of December 4th of 2019. I got the first call from the site at 2:30 in the morning on that. And then I have done the detailed analysis.

We had an initial -- the initial sonar survey was done in early January, and we had two holes drilled. We had additional holes drilled in early February, so we could get a better view, and that was the first big, really complete sonar survey.

Then the end of May we had a sonar survey and then the final conditions the last week of July.

I've been the one who's synthesizing on all of those.

Q. Can I ask -- so it sounds like by my quick math that you've been involved in the Carlsbad brine well project for approximately 12 years.

A. Yes.

Q. Okay. And just to clarify: Is the Carlsbad brine well mediation project, over time is it a

substantial portion of your work portfolio at Wood?

A. Yes, it is. When we were in the active, that really active phase of the feasibility study between 2012/2014, it was probably half of my time, and then over the course of the remediation it's about half of my time, also.

Other projects I'm deeply involved in, subsidence, land-subsidence work, and then other engineering geophysics.

But yes, when this project calls, I'm always there.

MR. TREMAINE: Thank you. Mr. Hearing Examiner, at this time I would move for admission of Exhibit 1 and tender Mr. Rucker as an expert in the areas of geotechnical engineering in the Carlsbad brine well.

MR. RANKIN: Mr. Examiner, no objection to the admission of Exhibit 1 nor to Mr. Rucker's status as an expert.

EXAMINER BRANCARD: Thank you. The exhibit will be admitted, and Mr. Rucker customer is qualified as an expert.

MR. TREMAINE: All right. Mr. Hearing Examiner, we intend to move through Mr. Rucker's remaining exhibits as I did with Mr. Griswold, and describe them. These will be in somewhat more detail than many of the prior

exhibits. And then I intend to move admission at the end of that process, if that works.

We will look to share these slides as we move through, if that is acceptable.

EXAMINER BRANCARD: That sounds good.

MR. TREMAINE: Thank you.

Q. All right. Mr. Rucker, let me see if this works on this screen this time.

Do you see on your screen what is labeled Rucker Exhibit 2?

A. Yes, I do.

Q. Thank you. Did you create this slide?

A. Yes, I did.

Q. And at a very high level please describe the information relayed in this slide in just a little more detail.

A. Without going into great detail, to the right is a plane view of the site. This includes our original, the outline of our original geophysically interpreted affected area, and then also as we have gathered more information on actual known voids, on that map are also locations of microseismic wells. Those are red dots.

Borehole tilt meters, ETMs. These are ultrasensitive devices that measure ground tilt. A tremendous amount of information obtained from these

devices.

The left is the results from the microgravity survey that was done by Sandia Labs. It has always been a very complex and provocative part of the geophysical characterization of this site. And it -- it indicates, without being able to answer, that we are dealing potentially with a very complicated geology. Well, especially for the Delaware Basin.

There are aspects of the gravity results that indicate that there has been variable dissolution of the salt formation, possibility of faulting. Just a lot of unknowns on this site.

I probably should leave it at that.

Q. Okay. And is my understanding correct that the gravity anomaly referenced is overlayed on the half of the slide on the right?

A. Yes. Yes. Yes.

Q. And that corresponds roughly with the unexpected void space discovered in December of 2019?

A. Yes. What -- yes. What happened was basically there were three data sets that gave us really credible information. There was a two-dimensional, set of two-dimensional seismic reflection profiles; there was -- there were high-resolution magnetotelluric surveys; and then there was the microgravity survey.

That shape of the -- the original shape that we were working from was basically a compendium of the seismic reflection and the magnetotelluric results. The gravity result was inconsistent with those. The gravity is in the peak on the right, and it always also pointed to the north.

When we began to get -- once the original microseismic network was operational, there was more seismic or microseismic activity to the north.

So we were suspicious that something was happening in that area. We thought it was down in the salt but we had no way of knowing until we actually got holes in the ground.

Q. Okay. And just to connect some dots and clarify here.

So the gravity anomaly referenced in the void space, these overlap, those are on the north end of the cavity.

A. Yes. Yes. Yes.

Q. Is it also correct to state that the north end of the cavity is the primary focus of the backfill operation currently?

A. Absolutely. Yes, absolutely. Even the gravity -- the gravity we surveyed did not put anomaly underneath the highway, so when we first got a sonar

survey that said we had void under the highway, that was a very unpleasant surprise.

Q. And so --

A. We didn't know that until January of 2020.

Q. Thank you. I didn't mean to cut you off. Did you have anything else to add?

A. No. No, no. That's it.

Q. And so if I'm understanding you correctly, the primary focus of filling the unexpected more recently discovered void space discovered probably a year and a half ago, overlaps significantly with this area where you have indications of an unknown but very complex geology. Is that correct?

A. Yes. It does. It does.

Q. And before we move on -- I think we will touch on this in more detail later but I just want to clarify. What is the primary concern related to any failure or issues with further degradation of the northern void space?

A. Okay. Our initial concern on the project, of course, was catastrophic collapse. Uhm, a sink hole, a large sink hole developing on the surface.

With the work we've completed so far it looks like we've gotten beyond that being a problem; however, we still have a situation where this void, being

in a condition of partial collapse and on small scale continuing to collapse, we are concerned still that the roof may basically work itself up into the fresh water aquifer which overlies -- which overlies the cavity in the site.

That could be a very significant problem. The brine is under pressure, and we could have a very significant ground water contamination problem, even if we had no issues in the ground surface.

Q. Thank you. Is it fair to say that while contamination of ground water is the primary concern, there is also the possible concern of surface subsidence?

A. Oh, yes. Yes. I mean, we're -- we -- we are in a situation now where it would be -- if we had a problem with the surface subsidence, you know it may be on the order of inches as opposed to the initial concern where it may have been tens of feet. But that could still cause issues with varied utility -- that could still be a pretty catastrophic set of problems.

Our strategy and the reason that we need to fill this thing up with sand as much as we can is because as the roof continues to collapse, the material bulks. When the rock falls out of the roof and lands on the rock, the rock rubble pile, which is the floor of this thing, the volume that it occupies is larger. And so our goal

here is to put enough sand in so that as the roof finally -- continues to collapse and bulk, is that it bulks and naturally fills the rest of the void and becomes stable before we hit that ground water table.

That is your goal. When Jim was talking about losing a lot of sand, we were losing -- that was because we were putting the sand on a pile of rock rubble, and a lot of that sand was going into the spaces between the rock particles. That's where we lost so much sand.

It was -- my recollection is we put 100,000 yards of sand in and had seen 30,000 yards of volume reduction. So about 70 percent of the sand we put in so far has gone into these spaces, but what we have accomplished is we filled those spaces up. So the more sand going in will be on top of already filled space, and that's why we're anticipating the next operation to be more effective.

Q. Okay. Thank you.

Before I move on to another slide, is there any other geologic significance to this slide that we need to cover?

A. I think this is -- this is the primary aspect of it geologically. As you can see, the southern end of this, as Jim had said, it was as we had anticipated, and that has been pretty well remediated so we are not

concerned with the loss at the canal.

Q. Okay. Thank you. I'm going to move on to what is Rucker Exhibit 3.

Did you create this exhibit?

A. Yes, I did.

Q. And again to start us out, before we get into any greater detail can you just give us a very big-picture explanation of what this exhibit contains?

A. What I'm trying to show with this exhibit is that the microseismicity network we've installed onsite is -- it is designed to locate and characterize microseismic events, if you think about magnitude -2 to magnitude 0, maybe upwards to magnitude Doppler 1.

It's designed for very small events inside the array of the core hole wells. It is not designed to be able to accurately characterize seismicity that occurs far removed from this site.

And so what I have done here is I've found -- well, there is a whole network of seismographs which are designed for regular seismicity. And its Texnet is one part of the consortium. So I went to one of the nearby seismographs that I could download brine history data for a seismic event and could actually analyze it, to be able to demonstrate what we can and cannot see with your system.

And specifically there was the magnitude 5 earthquake that occurred 75 kilometers south of Carlsbad on March 26th of 2020. Seismicity is a rapidly increasing phenomenon in the area. The fracking and disposing of the waste fluids is -- has increased the seismicity massively.

So what I wanted to show in this slide is basically the blue traces are the seismic traces from a nearby seismograph that has the proper frequency range to capture standard seismicity, Magnitude 1.5 up to, I don't know, Magnitude 7 or 8 or so.

That's these blue traces, and we're looking at the blue traces at different times here.

The orange traces that I have superimposed on that are what our microseismicity system can see, and that's just a high-frequency target of this much larger signal.

And on the lower-right corner where I -- I point out that the microsystem cannot see the most significant ground motion. This is to visually show that the largest ground motion that would have been seen on the site, which is a ground motion particle velocity of .023 inches per second, was essentially blind to our local, to our microseismic system.

What our system could see, and this is the upper-left corner, is unlocated triggers. And a trigger

basically is looking at a one-second slice of time, and on March 26th that's the largest of the black -- of the black traces going up. For 117 seconds the system was triggering but it couldn't make sense of it.

That's what our system can see, and that's the essence or what this slide is about.

Q. Okay. So when you say that your system is intended to pick up these smaller magnitude events within the network, I just wanted to clarify that.

Are you looking for -- specifically in terms of this design, what type of events within the cavity are you looking for when you use this system?

A. Ah. Thank you.

We're looking for rock fracturing. As stresses and strains occur, local rock failures happen. What we're looking for is analogous to -- go back to old movies in the underground mine with the timber supports. The miners are in there, and when the timbers start groaning and creaking and cracking, that's telling them it's time to get out of the mine. It's the rock version of that groaning and creaking and cracking that the system is designed to pick up and monitor.

Q. Okay. And one more clarifying question here.

So these events that, uh -- larger magnitude events and events occurring outside of the

network, so not within the brine well cavity, as I understand your explanation here, and correct me if I'm wrong, you can see those to some extent but you can't accurately measure where they are or the full extent of those events.

A. That's correct. What we see are -- we see an excess number of triggers. We know something has happened. So what we then do, is we go to the U.S. Geologic Survey website, Earthquakes Today, and we look and we see what has happened.

Also our bore hole tilt meters are so sensitive that they pick up the ground tilt that results from these earthquakes, and so when we do our morning bore hole tilt meter check, we look in: Oh, okay. We had some seismic event. And then that also tells us to go and look at the standard roof of the cavity.

Q. Thank you. Is there any other information on this slide that you believe is important to point out to the hearing examiners and to SPC?

A. I think I've covered the essence of it.

Q. Thank you. I'm going to move on to what's labeled as Rucker Exhibit 4. You created this slide?

A. Yes. Yes, I did.

Q. Okay. And same question: Please describe in high-level detail what the information indicates on this

slide.

A. Yes. Basically on the left is the initial monitoring, microseismic monitoring system that was installed and operational in 2014. It's the four push pins, the IWMS 1, 2, 3 and 4, and those are the stations that were used for monitoring microseismic (inaudible).

(Note: Reporter interruption.)

EXAMINER BRANCARD: Mr. Rucker, you're audio is really breaking up.

THE WITNESS: Let me turn my video off. Thank you.

(Note: The record was read.)

A. (Continued) Stations 1, 2, 3 and 4 were the original microseismic network that was operational in 2014. Wells -- the sensors in Wells 1, 2 and 3, those wells are as deep as 400 feet, and we had a set of sensors in those wells. Well 4 was 700 feet deep, and so we had a deeper sensor array in Well 4. That's what we used for the initial work.

And then in 2019 we installed the enhanced microseismic system that's on the right, and that's the core holes which are the dark, the dark circles, and that's 6, 7, 8, 9 and 10. And those were installed close to our brine cavity footprint, and so they are able to respond -- they are much more sensitive to microseismic

events immediately around the cavity. They can locate these events to a much higher degree of accuracy, and they can get down below magnitude -2 in their work.

That's really all I wanted to show in this slide.

Q. Okay. Thank you. While you're stopped, I just wanted to address...

Mr. Hearing Examiner, I'm fine with moving forward without Mr. Rucker's video. I just wanted to make sure that's okay for the proceeding.

EXAMINER BRANCARD: That's fine. Thank you.

MR. TREMAINE: Thank you.

Q. All right. I will move on to Rucker Exhibit 5.

Mr. Rucker, did you create this slide?

A. Yes, I did.

Q. Okay. The same question: Please describe the information contained in the slide.

A. Yes. What I've -- this slide was to visualize changes in the geometry of the brine cavity between the early February sonar survey and the late May sonar survey. It's -- on the right is a change in the floor, in the floor of the cavity.

I have other slides that I did not include in this, which included the roof.

But the essence of what I wanted to show is

there were changes to the geometry of the cavity floor between February and May. The areas in red -- and on the left you can see a north/south profile of this space. The areas in red are areas where sand -- where sand had been deposited and we could tell that it had been deposited.

The B areas, which are in white, are areas where the floor of the cavity was essentially unchanged.

The D areas in purple are areas where the floor of the cavity had measurably collapsed.

And if you look at the profile, on the north end of the profile, right part of the profile, some of that ground had dropped as much as -- the floor of that cavity had dropped as much as 20 feet, and the most likely sourced reason for this was that Magnitude 5 earth that happened on March 26th. That's the largest event that we have seen. And it's entirely possible that more, perhaps much more of the void floor had collapsed but was later covered over by sand. So we don't know if that was the case.

But this is -- this is -- this is clear evidence of likely effect of seismic activity, and that's the essence of what I wanted this slide to say.

Q. Okay. And just to clarify. Your thinking and your describing this in this manner is based on the occurrence in time of the two sonar surveys and the

Magnitude 5 earthquake which happened in between?

A. Yes.

Q. And am I understanding correctly that you do not have information to suggest any other cause?

A. Uhm, that would be the most likely. That would be -- that would be the most likely cause. That was a significant amount of energy.

Uhm, at this -- you know, the fact I'm unable to see or inspect really limits what we can understand, but a Magnitude 5 earthquake was certainly a likely cause.

Q. Okay. Thank you.

And the clarification on your previous statement about the amount of floor movement and the sand, am I understanding correctly that after whatever the combined floor movement was and the sand, that's -- and the sand bringing up the floor, that is how you got to the estimates that you have for the floor movement. Correct?

A. Yes. Yes.

Q. So absent -- what I'm getting at is: Absent the sand, the floor moved at least as much as you have measured here.

A. Yeah. Yes. There are areas where the floor may have moved, but we could not see it because it's been covered over.

Q. Okay. Thank you.

Anything else of geologic significance here before I move on?

A. I could mention quickly the purple D at the bottom. That was a portion of floor that subsided between January 8th -- the January 8th survey and the early February survey, and that likely was due to initially we were using GW-7, which is a well nearby, as a brine source for our operations, and it's possible that pulling brine out of that well could cause some of the floor material to be sucked and moved. So that caused us to change where we pulled our brine from for our slurry operations to avoid that kind of problem.

But that does indicate that the floor -- that the floor could be very sensitive.

Q. Okay. Thank you. I will move on to what has been labeled Rucker Exhibit 6.

Did you create this slide?

A. Yes, I did.

Q. Okay. And please describe generally the information contained in the exhibit.

A. What I'm trying to do is I'm trying to put together events at the brine cavity with regional seismicity. And so the regional seismic- -- and this is from 1989 to 2013. There's another exhibit, Exhibit 10,

which covers 2014 to the present.

There were five seismic events of Magnitude 4 or larger to the northwest of Carlsbad between 1999 and 2013, and there were a few other seismic events in the Magnitude 3 range, but not very many. So in the end of 1999 Eugenie 2 was discovered to be leaking. Then it was abandoned. Operators restarted single-well operations.

We've had -- we had at least two fairly substantial Magnitude 4-plus earthquakes before the I&W well was shut in and abandoned in 2008.

Then in 2009 we started monitoring, monitoring again with tilt meters in 2010. After the 2010 survey we had pressure monitoring. So by 2010 we had at least some degree of monitoring on the system. And then our surface surveys occurred in that time range.

This basically lays out a timeline of different events that sort of gives us a window of when the major partial collapse may have occurred. We don't know when it occurred.

Q. Could I just stop you to clarify?

A. Yes.

Q. Could I just interject to clarify what would you currently identify as that window for the first major collapse.

A. Somewhere between 2000 and 2010.

Q. Okay. And just to clarify the timeline somewhat, Woods and your involvement in this project began in 2009?

A. Well, we first were talking about it in 2009 but my first participation was in 2010.

Q. Okay. Thank you.

A. By 2010 we had pressure monitoring, and a major collapse should have -- should result in a large signature of pressure change. We haven't had one, so that is the basis for thinking that the major collapse occurred, or partial failure really happened before 2010.

Q. Is there any significance to the cementing operation referenced in the exhibits?

A. The Eugenie 2 cementing operations, the records of those operations indicated that cementing occurred at depths that are currently void, so the void probably wasn't there when Eugenie 2 was cemented in. So that's sort of in the starting to time to brand when -- well, the starting time for the collapse.

Q. Okay.

A. That was the major -- that's the major.

Operations at Eugenie 1, which is where the focus of operations were because you could get to Eugenie 1, really had nothing to do with the void. We

weren't looking into -- that was not in the void area.

Q. Okay. Thank you. I just want to, you know, clarify the intent of this slide. Am I correct in stating that this is meant for informational purposes but is not -- it's not a statement that you can attribute any particular causality to that major partial collapse?

A. That is correct. That is correct. It also gives us an indication of how sparse seismic activity was at that time. When we look at the recent seismic you see how things have really changed in the region.

Q. Okay. Thank you.

I'm going to move to Rucker Exhibit 7.

Did you create this slide?

A. Yes, I did.

Q. Please describe the information contained in the slide.

A. The primary information that I wanted to show in this slide was again to tie seismographs, seismograph results that are designed to measure regional seismicity down, because again we can't get that kind of information from the site.

This exhibit actually ties in with Exhibit 11, but we had -- there were two earthquakes that day. Earlier in the morning there was a Magnitude 3.8 event. The measured ground motion that that seismograph

NM03's location, you can see that relative to Carlsbad and to the seismic event. You know a Magnitude 3.8 event ended up with .0035 inches per second of ground motion velocity, and the Magnitude 5 event .023 inches per second, more than a factor of 10 higher, and you can also see the ground motion shaking lasted for a much longer period of time.

Q. Okay. Is the purpose of this exhibit primarily to demonstrate the difference in ground movement between the relative magnitude of these two events?

A. Yes.

Q. Okay. In terms of the ground motion, ground displacement, can you provide any more insider detail into the degree of ground motion or ground displacement that in your opinion poses a threat to the stability of the cavity?

A. Well, the ground -- ground motion velocity relates to the ground strain, and strain is -- strain and stress are related. The ground motion velocity does relate to strain, so the higher the ground motion velocity the higher the ground strain is occurring, and obviously the more strain the ground encounters the more likely you are to have a problem.

I anticipate with the brine cavity what we're looking at here is an accumulation of strains on the

rock mass supporting this cavity, and eventually you can end up with the straw that breaks the camel's back. It doesn't have to be the largest event, it just has to be the event that happens at a critical time that -- well, that something may be ready to fail.

Q. Thank you. Any other significance to this slide before you move on?

A. I think these are the primary, these are the primary issues. You'll see at the end where this data fits in with the predict -- with the predictive formulas for particle velocity as a function of magnitude and distance.

Q. Thank you. I'm going to move on to Rucker Exhibit 8. Did you create this slide?

A. Yes, I did.

Q. And please describe what you did to create this slide and what you're depicting in the slide.

A. Okay. This slide -- these are part of our daily reports from our daily instrumentation, daily instrumentation monitoring reports. Those are borehole tilt meter traces. Borehole tilt meters, they're installed about 20 feet below the ground and they measure ground tilt. These are ultrasensitive instruments. The full scale, the full vertical scale on these plots is what we would call 10 microradians where a microradian is the

equivalent of going a distance of 1,000 feet, and then dropping vertically 1,000th of a foot or .012 inches. These instruments are phenomenally sensitive.

But they do show the response of the instruments to different earthquakes. As it happens between March 24 and March 28, 2020, there was a Magnitude 7.5 earthquake in the Kuril Islands, that's north of Japan and Russia, and the Magnitude 7.5 earthquake was clearly picked up by these borehole tilt meters.

Then on the 26th of March you can see the Magnitude 3.8 earthquake, and then also the Magnitude 5.0.

Now, the 3.8 earthquake did not go off scale for those tilt meters. The Magnitude 5 event, uhm where full scale on this plot is 10 microradian, full scale with -- or the magnitude of that Magnitude 5 event was as much as 191 microradian that the ground tilted. It really shook the ground.

Also, these tilt meters show very small permanent ground displacements. Those are circles, and some of them may be delayed responses to earthquake shaking. Because it doesn't have to happen at the same time. You can have the shaking first. That builds up the stress and strain in the ground, and then have that strain relieved later, maybe a few hours later. But I've got some of those shown here.

And this is to show that these seismic events do cause measurable tilt if you have a sensitive-enough instrument. The ground does respond to it both dynamically, and then at times you can have permanent displacement.

Q. I apologize if I just missed this in the beginning of your response, but I want to ask you if there's anything you need to explain -- basically what is the difference between blue and green?

A. Oh, I'm sorry.

The blue trace is the tilt in the east/west direction; the green trace is tilt in the north/south direction. That's what that is. So these are measuring -- these are measuring basically two axes of tilt. This blue is for the east/west, green to the north/south.

Also the daily oscillation, the variation that you see in some of these instruments, uhm, that's most likely due to loading effects of the daily earth and atmospheric tides on the ground, on the ground loading.

These instruments are sensitive enough to see earth and atmospheric tides.

Q. Okay. And is there any significance related to elastic movement, as opposed to permanent displacement?

A. Yes. The elastic movement, and you can see

that, that's basically after the earthquake vibration comes back to its original position. The dynamic -- well, you may end up with some energy built up in the system that can cause a permanent displacement later, but the permanent displacements are maybe -- that's where the ground has moved. In these cases it has moved on a microscopic scale, but as you continue, as those very small movements continue to build, eventually you get to a macro condition and a failure, a rock failure.

Q. Is there any association between, uh -- related to when you see elastic versus -- you know, elastic movement versus permanent displacement?

A. Well, you would see -- if the permanent displacement is related to elastic movement, elastic loading, the elastic loading has to happen first. And so if we look on the leftmost of these traces, we have -- we have on the blue trace, I have a circle they "likely related." Shortly after, shortly after the Magnitude 5 event we had a fair amount of permanent displacement. On the green trace below we had a little bit of permanent displacement occurred during that earthquake, and then a little more delayed by maybe a couple of hours. Where I have circled "less likely related," either that's a permanent ground motion due to something else, or a more delayed response from that Kuril Islands earthquake.

You can see similarly in the middle traces, you can see a permanent displacement that happened a few hours after the magnitude 3.8 event, and then in the rightmost trace you can see another displacement in the green trace that happened well after the Magnitude 5 event.

But again it may be accumulated strain that's now been released.

Q. Is there any kind of relationship between what type of movement you would expect, and as opposed to the magnitude of the event, rather associated with the proximity of the event?

A. Well, that gets to scaling. In --

Q. Is that something that --

A. Yeah, that Exhibit 11. You can see that the Magnitude 7.5 halfway around the world does show up, and it may be comparable in size to a Magnitude 3.8 75 kilometers away.

Q. Thank you. In that case I'll move on to keep us on track here.

A. Yeah.

Q. So Exhibit No. 9, did you create this exhibit?

A. Yes, I did.

Q. All right. Please give us a brief outline of the information contained in this exhibit.

A. Okay. Well, let's start on the right side, because this is closure on the relation of seismicity and permanent displacement. Just I wanted to show an example -- this is in July of this year -- where we did have a permanent displacement that was -- that did correlate in time with the Magnitude 3.4 event. Again, this is 75 kilometers south of Carlsbad, and 65 kilometers south of White City.

There is an example or where we do have a have a direct correlation.

And then also it is very useful to say: Oh, and we had a Magnitude 6 earthquake, and that was in California, and that's also a similar magnitudes to the Magnitude 3.4 that's obviously much closer.

That's closure on the borehole tilt meter.

On the left I have plotted the pressure history of the annulus pressure sensor at Eugenie 1. This has been our primary brine pressure monitoring point for wells since 2010, and so it's very important to keep a an eye on this.

And I just wanted to show different aspects of variations in brine pressure, because brine pressure, brine being part of the mechanism that's holding this cavity open. Changes in the brine pressure also induces changes in stresses and strains on the cavity.

And, as it happened, we had a change in trend of what was happening with the pressure between the 26th of March of this year and the end of April. Apparently there was drilling in the vicinity of the well during that time, and during that time we had a pressure drop of almost .7 psi, as measured at the Eugenie well, and after that drilling activity ceased we had some recovery.

Q. And did --

A. This is related to --

Q. Can I interject with a question here?

So, first of all, do I adequately understand your testimony that in addition to seismicity, pressure changes in the brine well could pose threats to the stability of the cavity?

A. Oh, yes. Absolutely. Yes.

Q. Okay. And that --

A. It's changing the stress and strain. It's changing the stress reading.

Q. Thank you. And in this particular case you noted drilling in the vicinity. Do you know which wells were being drilled?

A. I do not. I was -- I was asked by Jim to check and see what our pressures -- what happened to the Eugenie pressure between March 26th and the end of April, and so I

first looked at that time period, and: Well okay, pressure dropped some. Then I looked at a larger time interval, and it's like: Okay. Pressure sort of came back up after that.

Q. So I just want to clarify --

A. I don't want to --

Q. Sorry. I just wanted to clarify that in my understanding that your -- your understanding that there was drilling taking place was based on information that you received in your request from Mr. Griswold?

A. Yes.

Q. Okay. And you didn't actually look into, personally look into which particular wells were being drilled or their proximity?

A. No.

Q. Okay.

A. No, I did not.

Q. I just wanted to clarify that.

Okay. I think we've covered this slide. Anything you need to add?

A. Uh, well, let me add: When you go further left there are other reasons that pressure can change, and I'm showing that some of that -- some of those reasons. There's certainly many possible causes.

(Note: Reporter inquiry.)

MR. TREMAINE: Thank you. Understood.

I'm going over with the second witness. I apologize. I'm trying to move this along efficiently here. I underestimated the time a little bit for this one. I'm agreeable to a break, but we have two more exhibits, and then about five general questions, which I think will go faster.

EXAMINER BRANCARD: Why don't we take a 10-minute break here. 3:30. Thank you.

(Note: In recess from 3:20 p.m. to 3:30 p.m.)

EXAMINER BRANCARD: Mr. Tremaine, are you ready? We seem to have two more exhibits. I hope we're coming to some of conclusion here.

MR. TREMAINE: Yes, we can move on pretty quickly here.

Thank you for everyone's attention. The second half did go longer.

All right. You should be seeing what is labeled as Rucker's Exhibit 10.

Q. Mr. Rucker, did you create this exhibit?

A. Yes, I did.

Q. All right. And please briefly describe the information contained in the exhibit.

A. This exhibit shows the microseismic history that we've recorded at the site. Those are the small blue dots

starting in 2014, continuing to the present. It also shows the regional seismicity, which are the larger yellow dots. And essentially we have a massive increase in regional seismicity that really didn't get started until 2020. This plot actually goes through May 22nd. It has four events that were Magnitude 4 or higher.

I just checked today on the USGS site. Since May 22nd we've had five more seismic events of Magnitude 4 or greater that have happened.

So the seismicity is increasing rapidly in this region.

Q. Is the --

A. At the -- sorry. Go ahead.

Q. That's quite all right.

Is the increase in seismicity a concern for the brine well because of potential cumulative impacts of different seismic events?

A. Oh, yes. Oh, yes.

Q. Is there an issue -- can you articulate an issue related to accumulation of these regional seismic events in combination with more-local, smaller seismic events, such as would be created by fracking, or completing, or for that matter, drilling an oil and gas well?

A. Well, as we -- as these events continue and as the cavity continues to -- the rock mass continues to

creep and develop, at some point more roof failures can be anticipated, could be expected. And the more that that roof condition in its very delicate state gets shaken and stressed and strained before we get this void filled, the more likely we are to have more roof failures and we lose -- we lose roof that we really want up there to protect the ground water.

Q. Thank you. And have you documented or noted any shifting or creep in the roof structure over the void space?

Yes. Yes. We've had, when I compared the sonar surveys, somewhere around 1,000 cubic yards of material in a period of six months is my estimate of how much material has fallen, which if you extrapolate that forward, about 2000 cubic yards a year that --

Q. In addition to -- Sorry.

A. No, go ahead.

Q. Let me ask a follow-up question.

In addition to rockfall, have you observed any creeping or buckling of the roof?

A. What we've observed is in our access wells that apparently -- and this is at a depth of about 315 feet, a clay (inaudible) horizon -- our access wells, our GW wells need to be reamed out. Actually, before we can do -- before we can do this survey, this next sonar survey,

these holes will probably have to be reamed out first, because basically there's a horizontal, apparently a horizontal movement occurring across -- probably at that depth. We've observed this between the May and the July surveys.

Q. Okay.

A. That's another indication. And also the borehole tilt meters are showing a gradual tilt in the whole regional rock.

Q. Thank you. Back more specifically to this slide, is it fair to say this slide represents, one, the rapid, significant increase in regional seismic events?

A. Yes.

Q. And that increase in regional seismic events correlates in time to observed changes in the roof structure or the floor structure and rockfall events?

A. It does correlate to them, but we don't have any -- we have no sonar surveys to compare with before this seismic activity really got started. We don't have a pre-seismic increase in seismic activity based on it.

Q. Thank you. I'm going to move on to Rucker Exhibit 11. Did you create this slide?

A. Yes, I did.

Q. And before we get started you will note down here under the measured PGV there's a reference to

Exhibit C. Does that represent a clerical error in the slide?

A. That represents an error. That should be Exhibit 7.

Q. Okay. Thank you. Could you give us a very high-level description of the information presented on this slide.

A. Yes. What I'm demonstrating is the relative equivalent of peak particle velocity or peak ground velocity as a function of moment magnitude, magnitude of an earthquake or a seismic event and it's distance. And that's essentially what we are doing. If you look in the lower-left corner you can see that at a distance of 75 kilometers, which is the distance to the field where we have so much activity occurring, Magnitude 5, 4 and 3, we have estimated the particle velocity based on -- based on that. And if you go to a much closer, which is our fracking-type distance, 3.3 kilometers, Magnitude 3, 2, 1, we are really in the same ballpark. A Magnitude 3 event at 3.3 kilometers is more than half of the ground motion of a Magnitude 5 event at 75 kilometers.

Q. So can I clarify that this slide stands for the proposition that smaller events closer in proximity to the brine well could have a same or similar effect to more significant events such as the regional seismic events of

larger magnitude farther away?

A. Yes, that's possible.

Q. Is it true that the red representation in the upper right represents your kind of ground truthing of the model?

A. Yes. I was ground truthing that model against a 2020 paper, which this whole thing, this whole thing of induced seismicity is very new, and so there is relatively little technical, scientific and published information on it, and I wanted to make sure that we were in the ballpark and consistent with what the literature that's out there is saying.

Q. Thank you. Is it also true that the literature related to seismic events caused by drilling and completion activities is relatively new?

A. Oh, yes.

Q. Does the technical literature indicate that fracking events can cause as much as a 3.0 magnitude event?

A. That seems to be an upper limit. The Alberta, one set of regulations actually, which -- ah, okay. Okay. Yeah, Alberta Energy Regulator Subsurface Order No. 7 basically says if you have induces a seismic event that is greater than -- half or greater than 3.0 local magnitude, you've got to shut down.

Q. Okay.

A. They have set that as a red line.

Q. So in your professional opinion they may not rise to the level of 3s but you could see possible events up to about that range. Is that fair to say?

A. Yes. What you expect is you expect many more events at lower magnitude and relatively fewer events at higher magnitude. That gets back to the old Richter earthquake.

A. Understood. Thank you.

I want to ask you some follow-up questions away from the slides.

Actually, strike that.

Mr. Hearing Examiner, I move to admit Rucker Exhibits 2 through 11.

EXAMINER BRANCARD: Thank you.

Mr. Rankin, any objection?

MR. RANKIN: No objections.

EXAMINER BRANCARD: The exhibits are so admitted. MR. TREMAINE: Thank you.

Q. Mr. Rucker, I just want to ask a couple of clarifying questions.

As we've talked through this in detail now, it is possible, in your opinion, that impacts through pressure changes in the cavity could impact the stability

of the cavern, correct?

A. Yes.

Q. And it is reasonably possible, in your opinion, that drilling and completion events for oil and gas activities in proximity to the cavern could cause changes in the pressure within the cavern.

A. From the data that I have seen, that is a possibility, yes.

Q. Okay. I have the same questions about seismic activity.

Is it your testimony that in your professional opinion seismic events related to oil and gas drilling could potentially impact the integrity/stability of the brine cavern?

A. Yes.

Q. Is it also true that the cumulative impacts of oil-and-gas-activity-caused induced seismicity, along with regional seismic activity could impact the stability of the cavern?

A. It's possible.

Q. Okay. And from the discussions today and your review of the materials, are you generally familiar with the affected acreage of the Caveman project and its proximity to the cavern?

A. I am now familiar with its proximity, yes.

Q. Is it fair to say that based on your understanding of the brine well, induced seismicity, and pressure concerns, that any drilling or completion activities within the affected acreage could cause issues for the stability of the brine cavern?

A. I have a specific concern. The location of those wells, at least as shown in Jim's exhibit, appears to be very, very close to the edge of the Capitan Aquifer, and that is a region which may have complex geology, possibility of weak horizons, of faulting, dissolution zones, which may --

Q. Can I ask a --

A. -- result in a possibly unusual event.

Q. Okay. Thank you. I didn't mean to interrupt. I want to clarify.

I understand your testimony to indicate that the affected acreage possibly has even further-complicated geology.

A. Yes. Yes.

Q. Okay. And I guess my question is: It sounds like your testimony is essentially that the distance or proximity to the brine cavern is one of the controlling variables when we're talking about pressure changes or induced seismicity. Is that correct?

A. Yes.

Q. So it's then fair to say that regardless of the orientation of the wells, based on their proximity and the location of that affected acreage it doesn't matter if they drill a horizontal well or a vertical well. Correct?

A. The vertical well would be more of a pressure issue.

Q. Okay. But it still represents a concern.

A. Yeah. Yeah.

Q. Okay. And same for -- uh, strike that.

Actually, the same would be true if they moved from one producing formation to another nonproducing formation; is that correct?

A. Yes. Yeah, again that's a minimal change in distance.

Q. Okay. You heard the testimony earlier from Mr. Griswold about the next STEPS in the project. Do you agree with Mr. Griswold's characterizations of where the project is at and the projected completion date?

A. Yes.

Q. Okay. And just overall -- uhm, so I want to highlight that there have been since late 2019 a number of significant changes in the information related to the brine well cavity, so I want to confirm my understanding with you.

There's been significant changes in your

understanding of the void space, correct.

A. Oh, yes.

Q. And the same is true with the process of the backfill operation, mainly the settling of the sand?

A. Yes.

Q. Okay. And the last concerns would be that increase in the potential cumulative extra seismicity related to increase in regional seismicity, and whether induced or otherwise.

A. Yes.

MR. TREMAINE: Thank you, everyone. That is all the questions I have for Mr. Rucker.

EXAMINER BRANCARD: Thank you.

Mr. Rankin, do you have any questions?

MR. RANKIN: Thanks, Mr. Examiner. Just a couple of questions real quick.

Thank you, Mr. Rucker.

CROSS-EXAMINATION

BY MR. RANKIN:

Q. Looking at your Exhibit 10, you identified some of the regional seismic events in the area and identified that some of those occurred at approximately 75 kilometers from the brine well cavity.

A. Yes.

Q. And what is the approximate range in distance

from the brine well cavity of those regional seismic events? Can you give me a range, like the closest events to the farthest events?

A. The closest events seem to be around 40 kilometers. Uhm, the farther events -- once you're out 150 kilometers the induced seismicity really doesn't -- does not have much effect.

The unlocated triggers from the microseismic system are a good indicator of these events that are typically at 75 kilometers. Most of this activity is from a region, uhm, sort of west of Mentone, and south of White City.

Q. Okay.

A. So -- sorry. Go on.

Q. I was going to say, so in terms of proximity approximately 40 kilometers would be the closest events.

A. Yeah. I think we've had a Magnitude 4 event, a 4-plus event down east of the Mag-da-la -- Magdala? I'm not local.

Q. No problem it's easy I to get tripped up on.

In your Exhibit 11 you have identified some literature that you referred to, but was there -- I might have missed it. Was there other literature that you referenced during your testimony when you were discussing Exhibit 11 besides the one that's shown on the exhibit?

A. I mentioned the Alberta Energy Regulatory Subsurface Order No. 7, December 9, 2009.

Q. Okay. Then I understood you to say that you did hear Mr. Griswold's testimony about the status, his understanding of what the next steps are with respect to the project in remediation.

A. Yes.

Q. Did you also hear him talk about how the contract with Wood hasn't been finalized yet, the amended contract?

A. Yes.

Q. Are you familiar with the status of that at this point?

A. Uhm, that's above my pay grade.

Q. So you don't know how close it is to being finalized or executed at this point?

A. No. No.

Q. And you don't know what the delay is in getting that amended contract finalized?

A. No.

Q. No? Okay.

A. No.

Q. But as soon as that's signed and ready, the work is ready to commence?

A. Yes. Yes. I mean, I'm continuing monitoring

the work now.

MR. RANKIN: Okay. No further questions from me, Mr. Examiner. I appreciate Mr. Rucker's time.

EXAMINER BRANCARD: Thank you.

Mr. Simmons, any questions?

EXAMINER SIMMONS: No. In the interests of saving time, I'll pass. Thank you.

EXAMINER BRANCARD: Okay. I just had a few clarifying questions, Mr. Rucker.

CROSS EXAMINATION

BY EXAMINER BRANCARD:

Q. In your Exhibit, I think No. 11, you refer to peak ground velocity.

A. Yes.

Q. But then in your Written Testimony you refer to something called ground motion particle velocity.

Are these the same things?

A. They are very -- they are the same things. They are -- it's inexact terminology, and I -- as a geotechnical engineer, vibrations lasting, uhm, I think in terms of controlling blasting by peak parcel velocity. But the earthquake people, which this information is coming from, they have their own vocabulary.

Q. Thank you.

A. Essentially we are talking about the ground

velocity.

Q. Thank you. On Exhibit 11 some of the numbers refer to 3.3 kilometers. I assume that's not an arbitrary number. Is that the distance from the brine well cavity to the proposed Caveman well?

A. It's -- uhm, I didn't know -- I did not know that, but if we're looking at a mile, 5,000 feet, and we're going down 8,000 feet -- I'd have to run the calculator.

Q. Okay. So you didn't pick the 3.3 kilometers? Somebody gave you that number?

A. I'm trying to think where that came from. I may have actually done -- I may have picked that, but I wanted to -- I wanted to account by my calcul... (Note: Pause.)

Q. Don't worry. That's okay.

A. 10,000 feet. We're talking hypocentral distance, so you have to take into account both the horizontal ground distance and the depth.

Q. Okay. Okay. That's good to know. Thank you.

Just quickly -- it's okay, Mr. Rucker. We can figure this out.

In your testimony you refer -- Mr. Rankin already asked some of my questions about the regional seismicity. You do say in your testimony that these are largely caused by waste fluid injection, correct?

A. Yes. Yes, at those distances. The technical literature has been focused on that because that's easier to -- it's easier to pull out of the seismic records. In reading some of the papers, they are actually -- the researchers are actually talking about using machine learning to try to pull out the much smaller fracking data. The issue here is, is that we're talking about the waste-induced events at a 75-kilometer range and then the fracking at a much closer range, so that the actual -- getting a handle on the actual range of magnitudes due to actual fracking operations is still a work in progress in scientific literature.

Q. Okay. Well, that leads to my final question which is: You have a statement in your Written Testimony that says, "Recent technical literature indicates that fracking activity may cause induced seismicity events up to approximately Magnitude 3.0," but then there is no citation for that, and so I was wondering if there was any support that you could provide, any articles or anything backs that up, other than just that assertion.

A. Well, I have the reference on Exhibit 11, Subsurface Order No. 7.

I could organize -- I mean, I could -- I could organize that information.

EXAMINER BRANCARD: Okay. Thank you. That's

all the questions I have.

Mr. Tremaine, is that -- are you done with your witnesses?

MR. TREMAINE: I'm sorry. I was muted. Yes, we are completed.

EXAMINER BRANCARD: Thank you. All right. Mr. Rankin, what do you have for us?

MR. RANKIN: I'd like to introduce our first and only witness of the day, Mr. Hanson Yates, and ask that he be sworn in and give a brief summary of his testimony.

HANSON YATES,

having been duly sworn testified as follows:

EXAMINER BRANCARD: Thank you. All right. I guess, Mr. Rankin, you're up.

MR. RANKIN: Thank you, Mr. Examiner.

DIRECT EXAMINATION

BY MR. RANKIN:

Q. Mr. Yates, will you state your name for the record.

A. Yes. It's Hanson Yates. H-a-n-s-o-n, Y-a-t-e-s.

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

A. I'm employed by Santo Petroleum, and I serve as president.

Q. Can you explain for the record what the

relationship is between Santo and SPC, the company that is the subject of the application today.

A. Yes. They are both wholly owned subsidiaries of a common parent company.

Q. And in what capacity do you serve under SPC?

A. I also serve as president for SPC.

Q. Have you previously testified before the Division?

A. No, it's my first time.

Q. Are you testifying today as a fact witness?

A. Yes, I am.

Q. And are you also familiar with the amended application that was filed by the Division?

A. Very much so, yes.

Q. Did you prepare a Written Self-Affirmed Statement that was filed last week in this case marked as Exhibit A?

A. Yes, I did.

Q. Do you adopt that written statement as your testimony today in this case?

A. Yes.

Q. Did you also prepare exhibits in support of your statement that are marked as Exhibits A-1 through A-8?

A. Yes.

Q. And were those exhibits prepared by you or

compiled under your direction or supervision, or do they constitute company business records or the records of the OCD?

A. Yes.

MR. RANKIN: Mr. Examiner, at this time I would move the admission of SPC Exhibits A, and A-1 through A-8.

EXAMINER BRANCARD: Thank you. Any objection, Mr. Tremaine?

MR. TREMAINE: No objections.

EXAMINER BRANCARD: So admitted.

MR. RANKIN: Ms. Salvidrez, At this point I would request that I have the authority to share my screen.

Thank you. Oops. Sharing the wrong screen. All right.

Q. Mr. Yates, are you able to see my screen now?

A. Yes, I am.

Q. Does this, marked as Exhibit A-1, does it identify the areas that make up the Caveman project area and the Caveman unit area, and wells that are the subject of the hearing?

A. Yes, it does.

Q. Does it also identify the relative location of the brine well cavity that has also been the subject of the Division's testimony today?

A. Yes.

Q. Does it also identify other wells that have either been approved or drilled or -- and the status of wells in the surrounding areas?

A. Yes, it does.

Q. And on the next page it identifies the specific well names, the dates of approval, dates the casing was set, and dates of first production where there has been production?

A. Yes.

Q. Now, with reference to this exhibit, if you would just explain briefly to the examiners what is the relative importance to the company of the Caveman project, which is highlighted here in yellow, and the proposed Caveman unit, spacing unit, which is highlighted here in red for the company.

A. Yeah. You know, the importance to the company really cannot be understated.

We are a small company. We've extended the vast majority of new capital investment and our human resources on this project over the last four years, and so the importance to the company is tantamount; it's really sort of one and the same with the company. So the Division's decision in this case and its determination on what it allows with respect to oil and gas activity around

the brine well facility could very well make or break the success or failure of our company. So it's very important to us.

Q. And relative to that importance, explain, if you would, the importance of a clear, fair Order.

A. Well, it needs to be equitable and one that certainly is not punitive of SPC, given all of our efforts to date. You know, that would cause unjust damage to SPC if it were to set us back from all the work that we've done so far.

Q. Okay. We will touch on that shortly in the rest of the summary.

Does SPC have approximately 4,600 leases that are still in their primary term in the Caveman project area and about 300 leases in their primary term in the Caveman unit?

A. Yes, it does.

Q. In order to hold those leases, to perpetuate them, is it true that SPC must drill wells capable of producing before the primary terms expire?

A. Yes, that is true.

Q. And the proposed wells in the spacing unit at issue here, the Caveman Unit, that are the subject of the OCD's Amended Application would have held some of SPC'S leases that are currently in their primary term to join in

production?

A. Yes, it would have held some of our largest and most significant leases. One of the largest leases we had expires on November 1st of 2021, and then hundreds of additional leases that would have been held by production from that unit begin to expire in the spring of 2022.

Q. The majority of SPC leases that we're talking about here, they have primary terms that are either three, four, or five years; is that right?

A. That's correct, yes.

Q. And what is your understanding now, based on the Division's testimony and your discussions with the Division, what the Division's goals are by filing its Amended Application?

A. Well, taking a step back, I do recognize, we recognize in discussions with the OCD, in fact we know that their primary goal is to maintain the health and safety of the people, the environment around the area of our operations. So we have also shared, and I know that they understand this, that that is our primary goal.

So it's something we are very much on the same page with the OCD.

My further understanding about their immediate goals with this hearing is that they really want to, and I think both Jim and Mr. Rucker explain and agree

with this, is that the intent is to temporarily delay any drilling within a certain radius. I'm still unsure what that might be, but temporarily delay any drilling within a certain radius from the brine well facility until they have successfully completed the remediation project.

Q. And your understanding is not that the Division is proposing or seeking a permanent prohibition of drilling of any kind, right?

A. That is my understanding, and most definitely also certainly my hope.

Q. And just to be clear, your understanding is that the Division is seeking a temporary prohibition of drilling and completion -- I think this came through very clear in their testimony -- of any well, whether it's vertical or horizontal in any formation within that Caveman Unit acreage until the Division confirms that the brine well facility has been remediated.

A. That was my understanding before today, and both witnesses certainly confirmed that.

Q. Now, having discussed your understanding of the Division's goals, what are SPC's goals in terms of immediate goals and then long-term goals?

A. Well, I think I'll start with one of the longer-term or near-term goals, that we really want to be able to maintain an ongoing dialogue with the Division.

We want to work with them on a basis that shares technical information, shares technical analyses, very forthcoming in helping us both arrive at a common solution and understanding of a data-driven, decision-making process that can help us determine what can and cannot be done around the brine well.

We want to take analysis out of the theoretical and move it into more of trying to quantify the potential risk and potential impact.

We certainly hope that the OCD would be open to considering lessening either the radius or the duration of any delay that it may impose on drilling in the area.

Then with respect to the immediate goals we have that you mentioned, you know, first we came here today to listen, and not necessarily debate but listen to the technical explanation of the OCD for this very sudden shift in policy that we had not foreseen, and so we wanted to get a better understanding of where they were coming from a technical basis. But then more urgently what we really need is regulatory clarity. We have been really sort of groping in the dark here for a while, as I know we will continue to talk through some of the timeline. We've been -- you know, great uncertainly for us, and as we talked about in the very beginning of my testimony this

decision is very important not only for this project but for our company.

So we need a defined radius, we need a defined duration, we need to understand what we can and cannot do. And be applied in a manner that's equitable, and certainly not one that would be punitive to an operator that's otherwise been in very good standing with the OCD.

Q. And at the time SPC was formed as a company in 2017 and started acquiring leases around the Carlsbad area, was SPC aware of the existence of the Carlsbad brine well and the cavity?

A. Yes, we were very aware of it.

Q. Going into SPC's acquisition of its leases within this highlighted Caveman project area, what was the basis of the company's understanding of the Division policy regarding oil and gas development around that facility in the cavity?

A. The basis of our understanding is a 2009 internal policy that was publicly published that was a brine well Area of Review. That is on the map. You can see it with the green circle. It's essentially a 1/2 mile radius that was established around the brine well facility.

And essentially our understanding of the

AOR is that -- not that it would necessarily prevent drilling anywhere within it but that it would just -- if you had a surface hole location in that AOR it would come under extra scrutiny from the Division.

Q. And how does that policy guide the Company's decisions and planning in terms of acquisition of leases and proposing to develop wells?

A. We very much took it into account. We defined our project boundaries in part based on that.

You can see on the map the green circle goes into four sections. The brine cavity is located -- I know these sections by heart, because we've been doing the project for so long. The brine cavity is in Section 17 of 22 South, 27 East, but that circle extends into the neighboring three sections of 18, 19 and 20, and given all the tracts of land in Southeast New Mexico, luckily for landmen, are all rectangles, and our intent was to form units, as we have done, that are inclusive of an entire section of land, we decided we would just stay out of those entire four sections, because we wanted to not run the risk of having the OCD say, "Hey, you know what? We don't want to include any of the lands that are covered by the AOR in this unit." And so we just decided, You know what? We are not going to lease anything in those sections with the intent of developing it.

So we defined the southern border of our project based off of that AOR, which again is the only known public policy that we've ever seen with respect to operations around the brine well facility.

Q. And then based on SPC's plans, did it present the Caveman Unit specifically, and its proposed wells associated, through this pooling application and APDs to the Division on five different occasions between September 2019 and May 2021?

A. Yes, we did.

Before we go into that, Adam, I would add that we stayed out of those four sections of land that the AOR covered in spite of a very positive assessment of the geology of both the Wolfcamp and the Bone Spring, which were the formations we were pursuing with this project.

But to answer your question, yes, we presented as early as September 19th of 2019, and that was the first of five applications with respect to this unit that weren't before the OCD.

Q. And at the time during any of those presentations or any of the time that the plans were raised with the Division, did the Division raise any concerns about the location of proximity to the cavity with SPC?

A. No, not once. We actually brought up the brine

well in research we have conducted on it in our September 19, 2019 testimony from our internal technical expert, technical witness, and still there was no mention from the OCD of the brine well or the remediation methods.

Q. Approximately how far away is the company's first planned well from the brine well cavity?

A. Well, I think this will answer Mr. Brancard's question as to the 3.3 kilometers.

The first well that we proposed, that we were contracting a rig and were moving it in before all this occurred in early July, is the Caveman 402 well, which is on the map. It's the northernmost of the two green horizontal wells that's shown on the map. It's in the Wolfcamp Formation, almost 9,000 feet TBD.

The well surface hole location is 1.4 miles north of the brine well facility, which would put it .9 miles outside of the AOR.

And then if you look at the depth of the lateral, the closest point from a subsurface standpoint is shown on Exhibit A-4. That is 2.2 miles away, which I believe is 3.3 kilometers. So, Mr. Brancard, that might be the answer as to -- we had shared that number with the OCD in my June 17th letter, so that's probably why Mr. Rucker had that hydrocenter distance.

And then our furthest point away from the

brine well cavity is three miles at the toe of our well to the west.

Q. Did SPC learn at some point from another company operating in the area that the Division had concerns about drilling and completing wells in the vicinity of the brine well cavity?

A. Yes. That wasn't until May 4th. I had coffee with somebody who asked me was I aware that he had been asked to delay the completion of four wells in the vicinity. I was not aware of that. I confirmed that verbally with Mewbourne the following week on May 13th.

Q. Was it a surprise at that point for SPC to learn that the Division might have concerns about wells more than half a mile away from the brine well cavity?

A. That would be an understatement. Yes, it was a big surprise to us. The first we had heard of that.

Q. And tell me, if you would just briefly, why? Why was it a surprise at that point, given the background that had come before?

A. Sure. Well, like we had talked about, we had been in front of OCD September of 2019. In fact, we -- not only was there not a mention of that during the hearing, we actually had our work -- it's a very complex project, a number of tracts involved, and very, very complex. We got a compliment from one of the examiners on

the diligence we had taken, you know, to identify owners.

So, again, no mention from 2019. All the way up until May of this year we had had consistent approvals from OCD. In fact, our latest approval of the name change that Jim referenced, the Caveman 402 well, that was approved after we had heard this news through the grapevine that they would be asked to delay the completion of their wells.

That's one reason we were very surprised.

And then if you look at just, you know, following through the public record, if you look at APDs and allowed drilling and completion activity, there was no sign that the OCD had had any shift in policy.

Jim mentioned this. There were wells that were approved, the heavyweights' wells which I reference in my testimony, that were directly underneath the brine well facility and underneath the AOR, and those were actually re-approved, just almost rubber stamped in June of this year.

So even after all this had occurred, there was still no sign publicly of a shift in policy with respect to the OCD approvals.

Q. Did you prepare a map and timeline laying out the sequence of events on which you based your understanding that the policy had remained consistent?

A. Yes. And that's the -- sorry. Go ahead.

Q. I was going to say those are Exhibit A-1, which is the map that has some timeframes on the second page, and then A-3, which is your timeline showing a series of events going back to 2008?

A. Yes.

Q. During any of that time prior to the end of June, did the Division ever reach out to SPC?

A. No. We never heard from them once.

Q. Now, SPC had plans, when you heard from Mewbourne, to drill and complete its first Caveman Unit well, the 402H, in the June/July 2021 timeframe and then complete that well in the September/October, 2021 timeframe.

A. Yes. Again, the importance of this well -- the importance of our project has been stated. The importance of this well to that project is basically parallel. You know, it's the first well, we chose the best geologic location within the new project, and so many years in the making. So yes, we had had plans to drill and complete as you outlined.

Q. And did SPC then have concerns about proceeding to commit capital to undertake that drilling in light of what you learned from Mewbourne?

A. Most definitely. We did not want to get caught

in the same situation that we felt they were caught in.

We were left to guess, because we had not been contacted by the OCD as to whether or not perhaps they had established a different radius. There were a couple of the wells are a little bit closer from a subsurface perspective than is our well, and so -- a couple of the Mewbourne wells are closer than our well. And so we were wondering: Well, maybe they had established a radius and we're outside it. Who knows? But just to err on the side of caution, we decided to contact the OCD.

Q. And that's the letter that's marked as Exhibit A-7? I'm sorry.

A. I was just going to say investing 40 percent of our capital and then not being able to complete that well until the remediation project would be done -- which is the position Mewbourne is currently, is apparently potentially in -- it's not an enviable position.

Q. So because of those concerns, that's when you sent that letter to the Division on June 17th that's marked as Exhibit A-7?

A. Yes.

Q. And that letter notified the Division of your plans to drill and complete that 402H well?

A. Yes.

Q. And then in response the Division requested that SPC voluntarily delay drilling and completing its planned well for six months to one year?

A. Yes.

Q. At that point you informed the Division that SPC could not voluntarily agree to that delay?

A. Yes, that was our response. And the reason for that, Adam, is, you know, we talked about some of the contractual obligations with respect to the primary term of the leases that will be expiring in the event we do not drill and complete a well and have production and quantities. So our first lease we referenced earlier, November 1st is subject to expiration, and to the extent we don't establish production or begin operations and continue those across the expiration of that lease. And then we have hundreds of other leases, as I stated earlier, that would expire in the spring. So a 6-to-12-month delay threatens the existence of all of those leases, and not to mention we have a Joint Venture Agreement with a nonoperating working interest partner that's threatened with termination to the extent we don't start any well, begin drilling a well by the end of this year.

We also lost the negotiation of a second Joint Venture Agreement once this Emergency Order you're

about to reference, I'm sure, occurred. So many contractual obligations that just put us -- I believe the OCD understood this. We had a call on June 30th. I think the OCD understood the damages were just far too great to SPC that we were not in a position at all to be able to voluntarily delay our operations.

Q. So then as a result of that communication with the Division and inability to voluntarily agree, that's when the Division issued its Emergency Order that's marked as Exhibit A-8?

A. Yes.

Q. Then as a result of those discussions and the Emergency Order, you understood that the Division would act to prohibit SPC from drilling any well within any formation within the Caveman acreage?

A. Yes.

Q. Then following that Order, then the Division filed this Application and its Amended Application to revoke SPC's Pooling Order for that unit, and the APDs associated?

A. Yes.

Q. Without going into detail, does your Written Testimony outline the time, effort, expense, costs incurred by SPC to acquire all those leases and obtaining the regulatory approvals that were necessary to drill and

produce the Caveman Unit well?

A. Yes. Yes, it does. Those efforts were very extensive in terms of both time and money.

Q. In fact SPC has already expended in the order of tens of millions of dollars of investment capital to prepare its drilling program in the Caveman project in the specific unit?

A. Yes.

Q. And would those investments and effort that you've expended be lost and have to be redone if SPC's Pooling Order and APDs are revoked, in your opinion?

A. Yes, they absolutely would be. We would have to start from scratch, potentially from a legal perspective, and definitely from a regulatory perspective it would cost us, again, both time and money.

Q. And do you agree that revocation is appropriate and serves the goals of the Division as you understand them?

A. No. In fact, I would say I would wholeheartedly disagree that it is either equitable or serves the goals of the Division or SPC, or that it's at all applicable in this scenario.

Q. And your Written Testimony provides an explanation why you believe that to be the case?

A. Yes.

Q. Does it also suggest a potential alternative the Division may pursue?

A. Yes. And I'm happy to hear that the Division is taking that under consideration, and certainly hope that that will be the route it takes.

Essentially the alternative that we've outlined is using authorities the OCD already has to place conditions on existing Orders, rather than revoking the Order or revoking the APDs and undoing all that hard work that is extremely time-consuming. The OCD can essentially add a condition that SPC will be prohibited from developing the acreage and drilling the wells until such time as the OCD has deemed the remediation effort complete. This would put the control in the OCD's hands, considering they would be the ones that would be determining whether or not the condition has been met.

Q. And the time frame in terms of when that suspension should take effect, essentially is it your proposal that it would toll the remaining time on your Pooling Order and APDs from the effective date of the Emergency Order? Is that correct?

A. We think that's most equitable. Effectively we have not been able to move the rig in We were, by the way, hours away from taking possession of a rig on July 2nd, so we were very close to moving a rig in when the

Emergency Order was issued.

We obviously had not been capable of actually moving a rig in. If we were to do so, obviously the OCD would have the authority to issue another Emergency Order, and that's a game of chicken neither one of us were going to play.

And so it made a lot of sense -- well, it makes a lot of sense to me that should the OCD issue a condition now that it would be retroactive to that July 2nd date, because that's effectively when we have been unable to do anything, not only on the Caveman Unit but anything within our project. We've been somewhat paralyzed since July 2nd.

So we think that's the most fair.

Like you were saying, we think that the time remaining on our unit and our APDs should be tolled, so stop at July 2nd so whatever remaining time we have on it, once the OCD says, "Okay Green light. Go ahead and drill," that's when we should start to then go back into that primary term, so to speak, of our Order.

Q. And how would -- in your opinion, would a Suspension Order or Conditional Approval and the timing required, would that, in your view, achieve the goal of the Division to prevent having a company from completing its wells until remediation is deemed complete.

A. Absolutely. We could't go out and drill, and like Jim had mentioned, you know it would make sense. We wouldn't be able to drill during that time period. It would achieve the same objective but much more cleanly and gently.

Q. Without having to require you to, essentially, do all that regulatory work and lease work.

A. Yeah, work that has already been approved in every other aspect by the OCD as properly done.

Q. What about future APDs that SPC may plan to submit in areas that are a little farther away from the brine well cavity?

I'll refer back to Exhibit A-1 where you have got three existing compulsory pooled units just to the north here in green noted as B, C and D.

What about those units and the associated wells proposed for that area?

A. You know, I think any condition and any process that is established by an Order subsequent to this case that adds this conditional approval to it could and should be applied not only to existing units, so you have those three units that we've gone through the same process with the OCD, had approval -- again no mention of the brine well as a risk in that (inaudible). They are further north and further away from the MCD (phonetic). Or excuse

me. Further away from the MCD? They are actually closer to the MCD but they are further away from the brine cavity.

And to the extent the OCD -- if those fall outside an area of concern that the OCD hopefully clearly establishes on the heels of this, we would love the opportunity to be able to develop that acreage now. But if it is within an area of concern that they clearly define, then we think it would be most fair that this condition is applied to those, as well; therefore, the tolling process would begin ideally effective July 2nd. Again, that would be most fair, to me, but at least as of the date of Order that those can be applied.

In addition to that, we were in the process, are in the process still of beginning to apply for two additional units that cover acreage in that yellow. I don't know if the OCD -- again will it fall inside the radius that's yet to be defined? I don't know. If it does, I would like the OCD, rather than telling us, "No, you can't form that unit while this delay is going on," I would think it would most fair if the OCD receives those applications, and if they are fit to be approved, they approve them, and then again do they the same process: Place the condition on them, and say you can't drill those until the brine cavity is remediated, and then

only at that point would a timeline on those new Orders begin to run.

Again, I think that's most fair. It would put all the acreage in that same area under the same conditions. There are other operators in the exact same position. I know there are people trying to form units that we're seeing south, operators who have a (inaudible)

Some clearing from the OCD would be much appreciated there, and I think that would be -- at least with respect to us, I can't speak for other operators, but with respect to us we think that would be the most fair application of the OCD's authority that would help give us some clarity on what we can or can't do.

Q. So to summarize, what you're hoping comes out of all of this with the Division, what are SPC's requests with the Division going forward?

A. Well, like I said earlier, you know we have these near-term sort of post-hearing goals.

Maintaining a real dialogue with the OCD. And what I really beg of the OCD is that they are open to new technical analysis, and that to the extent -- you know, they use the word non-negligible but unquantifiable. To the extent we can begin to pull out of that, I'd say their nebulous definition into something more quantifiable that we can start to understand the real potential of risk

that operations pose, using hard data, and we have an open discussion, I would just like the OCD to be receptive to that. Because the implications are very large for us and other operators in the area to delay, curtail, forever prohibit drilling and completion in the area.

And so I would really like them to be open-minded in being able to receive technical analysis that could help lessen either the radius or the duration of time, and even be open to allowing drilling completion activity prior to completion of the remediation project should the technical evidence support it.

We are not here -- we don't have all the data in front of us to be able to analyze, and so we aren't here to present a technical case. We're here to hear a technical case. But what I would like is an open dialogue going forward, and I hope that they are willing to do that.

Q. So --

A. Sorry. Go ahead, Adam.

Q. No, no. Go ahead.

A. The biggest thing we need is just some clarity.

I think it's really obvious from our record, and it's obvious from testimony from the OCD today, there has been a lot of back and forth, a lot of confusion. And when you're trying to have a project

that's a very complex, commercial project to carry out -- we have tens of different variables, probably hundreds of different variables that we have in trying to plan a project of this magnitude. And we had worked off of all publicly available information with respect to OCD policy around this brine well. We thought we had understood that four years ago, and so the fact that's there was a sudden shift in policy, we would like it to be thoroughly explained, but we also -- we need clarity: What can and can we not do? Is the OCD willing to continue to communicate evenly, fairly, clearly about what its stance is, and then be open to, like I said on my first point, technical evidence that could help even shape its stance on that?

So I think regulatory clarity and ongoing open dialogue are the two things we need. That's it in a long-winded way. Sorry. I'm going to run to my soccer game.

Q. So on the topic about data information and discussions, is your request that the Division continue to share information and data that it has obtained and continues to receive regarding the brine well and the brine well cavity?

A. Yeah. We submitted an IPRA request that was lengthy, but that was submitted, I believe, almost two

months ago, if not to the day two months ago. And we appreciate the information that the OCD has shared to date. You, know it was not a short request. We wanted to be able to really get the raw data and analyze it ourselves. But still I would say the most important pieces of data we do not have yet.

And so I would hope the OCD continues to be willing to share information with us so that we can conduct our own independent analysis that would simply be for their consideration.

Q. In fact we just got some additional information last night, and we are continuing that process; is that correct?

A. Yes. And we appreciate that.

Q. Why is the information that you're asking for still so important for SPC?

A. Well, again, you know, I think Mr. Rucker had some rather lengthy and detailed explanations of a lot of good work that he has done in his exhibits. We would like to be able to take some of the raw data that's available from the monitoring stations, and make sure that we could go a step further. This is that important to us that we would like to be able to engage our own seismology experts to be able to try to help quantify the risks of our operation and not, then, risks of some operations from

neighboring operators, and put that before the OCD, again simply for their consideration, and to the extent we can make them comfortable with our proceeding earlier, or proceeding -- just to be able to ensure that we can proceed immediately upon the completion of remediation would be our potential benefit of having that data.

So that's why we want it. That's why we asked for it in the first place, and I think the OCD has always -- I hope always understood that, because that's how we communicated from the beginning.

MR. RANKIN: Thanks very much, Mr. Yates.

With that, Mr. Examiner, I have no further questions and pass the witness for examination by others.

EXAMINER BRANCARD: Thank you. Mr. Tremaine any questions?

MR. TREMAINE: No, I thank Mr. Yates for his time, and good luck with his game. No questions.

THE WITNESS: I'll let you know how it turns out.

EXAMINER BRANCARD: Just quickly, Mr. Yates, I assume what you're talking about, your proposal, is in paragraph 46 of your testimony?

THE WITNESS: Oh, boy. I'm going to have to ask Adam to confirm that, and if he says yes, I'll agree. I didn't memorize all the paragraphs, don't have it in front

of me. But let me see, somebody is pulling it up.

Are you talking with respect to the conditional approval process?

EXAMINER BRANCARD: Yes.

THE WITNESS: The answer I'm being old is yes, so I believe that yes.

EXAMINER BRANCARD: Thank you.

THE WITNESS: Thank you. For the record, ideally we would be allowed to work with the OCD to move forward in our operations, but in the immediate sense, just from a regulatory standpoint, to give us a proper pause, that is our preferred mechanism for doing so, that over the revocation.

EXAMINER BRANCARD: Mr. Rankin is that all you have for today?

MR. RANKIN: That's all I have for -- well, in this case. Yes.

EXAMINER BRANCARD: Mr. Simmons, any questions? Are you still there?

EXAMINER SIMMONS: I'm here. And, yeah, I did have a question or two.

CROSS-EXAMINATION

BY EXAMINER SIMMONS:

Q. Mr. Yates, is my understanding correct that you have leases that are going to expire beginning November

20th of this year, 2021, and then hundreds of leases that will expire spring of 2022 if you are not able to bring on one of these initial wells in the pink quantities?

A. Yes, sir.

Q. And then is there a force majeure that will prevent those leases from expiring if an Order is given that, uhm, like you proposed, a COA is attached? Will that then save those leases?

A. You know, I'm not a legal expert, but yes, in my opinion we do have force majeure provisions that I would argue this is the reason for a force majeure provision. And so, yes, sir, that would be our intention, is that we would trigger the force majeure provision to help extend and toll the term of those leases.

One thing I would add: The importance of having it retroactive to July 2nd, that's when we were going to get out to drill a well, November 1st being that first expiration, if we didn't receive an Order until, say, October 1st, and the Order says: Well, the Order is effective today that you can't drill, not July 2nd, when we come out on the other end that would only give us a month to find a rig, move it in, and start drilling. So that's why I asked for that retroactive date to July 2nd.

I hope that makes sense, sir. I'm getting a little nuanced on lease terminology here, but...

Q. That's fine. How would a COA differ in terms of the force majeure versus just flat-out revocation of the spacing units and the APDs? Will the force majeure come into play in either of them?

A. Could you define COA for me? I'm sorry.

Q. Condition of Approval. You proposed that OCD attach conditions to the spacing units and the APDs preventing you from drilling until the remediation is done. Will the force majeure be invoked in either case, the revocation or condition?

A. To us it was actually -- I think, for one, just to go back, my main argument against revocation is that I felt it was unnecessarily punitive of us, because once the Division determined it was safe to drill in the vicinity, then we would have to start all over again, and our lease term would be running again and we would be up against now new deadlines, and having to wait, you know, oftentimes 9 to 12 months from application to approval on the Order.

So it's mainly that punitive component that I felt was justification for a COA versus revocation.

However, there was some nuance on revocation where we felt if you revoke our ability to drill within a certain area, it doesn't necessarily -- it may not necessarily clearly prohibit our ability to reapply within other formations. So it becomes a little

bit of a regulatory "do" loop of do we have to go and be denied an application for an Order on every single horizon before we technically got into force majeure?

So it just -- to us it was much clearer, and more importantly much more fair application with a COA versus using revocation.

Q. Sure. But if OCD does attach conditions to existing Orders that you cannot drill until the remediation occurs, then the force majeure should allow you to hold your leases? That's your belief or argument at this time?

A. I would argue that it would. Yes, I think that would be the case.

EXAMINER SIMMONS: Okay. No more questions. Thank you.

EXAMINER BRANCARD: Thank you. We may be done with you, Mr. Yates.

THE WITNESS: Okay. Thank you very much for your time, everybody.

EXAMINER BRANCARD: Sure.

So where are we, folks? We're getting near the end of the day here. Time to go to soccer games.

So Mr. Tremaine.

MR. TREMAINE: Nothing further.

EXAMINER BRANCARD: Okay. I think what we need

is what you had sort of discussed at the beginning of the day, or the afternoon, which is a response from the Division to the proposal made by SPC. And I think it's helpful that that paragraph I pointed to is really specific about what they are willing to agree to.

I would assume that Mr. Rankin -- you know, I guess you're willing to work it out directly with the Division but do you prefer to have an Order after a hearing on this?

MR. RANKIN: Mr. Examiner, I think in light of the circumstances and the nature of the issues here an Order would be imperative. And so I appreciate your and the Division's willingness to take note of the equitable issues that we raised in testimony with their Proposal to Revoke.

I believe that there are potentially alternative Orders that could be issued that could refer to, incorporate by reference future Conditions of Approval that would substantiate the conditions.

So I think an Order would be of the most importance as a result of this hearing.

EXAMINER BRANCARD: Thank you.

So Mr. Tremaine, how much time do you need to respond to the proposal?

MR. TREMAINE: I would envision that the OCD

would submit for your review a Proposed Order, and in order to do that and incorporate the provisions and after internal deliberations, could we have two weeks?

MR. TREMAINE: I don't know. Mr. Rankin?

Do you want to work on this Order by yourself or do you want to work with SPC? From my perspective I just want to see your position on this issue. If it comes in the form of a Proposed Order, that's terrific, but that would really make our job here with the examiners really a little easier.

Yes?

MR. TREMAINE: Well, there are a number of moving pieces, so I don't want to, as I optimistically estimated our time for testimony today, I don't want to optimistically estimate our time for those internal deliberations. It is a new point in the discussions between the parties, and as alluded to there is a development policy related to the perimeter area of concern around the brine well.

So that's more complex than we need to get into here, but I worry about less than two weeks, if that is agreeable for Mr. Rankin.

MR. RANKIN: That would work for us. I think timewise that's a reasonable amount of time. So we appreciate the Division's willingness to try to get a

Proposed Order to the Division in a relatively quick turnaround.

EXAMINER BRANCARD: All right. So Mr. Tremaine has offered to draft a Proposed Order. I don't know feel the need to prepare your own proposal, Mr. Rankin.

MR. RANKIN: I guess I'll wait and see what the Division has to propose.

EXAMINER BRANCARD: I mean, I guess I think Mr. Yates' testimony is pretty clear about what you're offering here, so...

All right. Do we have any other matters on this? Are we understanding where we are going with this? I don't want leave things hanging in the air here.

Mr. Tremaine, two weeks from today can you come up with a Proposed Order?

MR. TREMAINE: Yes. Understood.

EXAMINER BRANCARD: All right.

So that is Case 22102 for those of you who have been listening, just tuned in.

(Time noted 5:02 p.m.)

STATE OF NEW MEXICO).
: ss
COUNTY OF TAOS)

REPORTER'S CERTIFICATE

I, MARY THERESE MACFARLANE, New Mexico Reporter CCR No. 122, DO HEREBY CERTIFY that on Thursday, September 9, 2021, the proceedings in the above-captioned matter were taken before me; that I did report in stenographic shorthand the proceedings set forth herein, and the foregoing pages are a true and correct transcription to the best of my ability and control.

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

/s/ Mary Macfarlane
_____

MARY THERESE MACFARLANE, CCR
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