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STATE OF NEW MEXICO
ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:
CASE NO. 25875

HEARING - DAY 2

DATE: Tuesday, July 28, 2026
TIME: 9:00 a.m.
BEFORE: Felicia Orth, Hearing Officer
LOCATION: Wendell Chino Building
1220 South St. Francis Drive
Pecos Hall
Santa Fe, NM 87505
REPORTED BY: Ryan Auten
JOB NO.: 8347075

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A P P E A R A N C E S (Cont'd)

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A P P E A R A N C E S (Cont'd)

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1 ALSO PRESENT:

2 Dr. Gregory Schnarr, Principal Environmental
3 Scientist

4 Justin Wrinkle, Engineering Bureau Chief - OCD

5 Dr. Hassan Khaniani, Assistant Professor - New
6 Mexico Tech

7 Dr. Sai Wang, Assistant Professor - New Mexico
8 Tech

9 Matt Eales, CoolSky Energy Solutions

10 Jennifer Raney, Deputy Director of PRRC

11 Katherine Walton, WELC

12 Elvis Leunguen, EMNRD (by videoconference)

13 Caroline Wachtman, Attendee (by videoconference)

14 Allison Marks, Attendee (by videoconference)

15 Delilah Dougi, EMNRD (by videoconference)

16 John Garcia, EMNRD (by videoconference)

17 Peter Kondrat, EMNRD (by videoconference)

18 Robert Mathes, Attendee (by videoconference)

19 Tiffany Wallace, Attendee (by videoconference)

20 Phillip Goetze, EMNRD (by videoconference)

21 Heath Lovell, Attendee (by videoconference)

22 Gerasimos Razatos, EMNRD (by videoconference)

23 Erin Ramaker, Attendee (by videoconference)

24 Anthony Harris, EMNRD (by videoconference)

25 Le Teaisha Carter, Attendee (by videoconference)

A P P E A R A N C E S (Cont'd)

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Rosa Romero, EMNRD (by videoconference)

Serafina Seluja, Attendee (by videoconference)

Dr. Helm-Clark, Attendee (by videoconference)

Mike Eisenfeld, SICA (by videoconference)

Carl Chavez, EMNRD (by videoconference)

Charlie Palladino, Attendee (by videoconference)

Rocky Jaramillo, Attendee (by videoconference)

Liz Kuehn, Attendee (by videoconference)

Melissa Troutman, WildEarth Guardians (by
videoconference)

Eduardo Ugarte II, Attendee (by videoconference)

Brandon Powell, EMNRD (by videoconference)

Andrew Forkes-Gudmundson, Earthworks (by
videoconference)

Charles Harvey, Attendee (by videoconference)

Felicia Orth, Hearing Officer

Dr. William Ampomah, Commissioner

Paige Czoski, Commissioner

Sheila Apodaca, Commission Clerk

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I N D E X

WITNESS(ES):	DX	CX	RDX	RCS
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E X H I B I T S

NO.	DESCRIPTION	ID/EVD
	(None marked.)	

QUESTIONS INSTRUCTED NOT TO ANSWER

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1 P R O C E E D I N G S

2 THE HEARING OFFICER: I believe we're
3 ready to begin this morning. We're on day two of the
4 hearing in the matter OCC 25875. And we have reached
5 our second public comment opportunity. I believe
6 there's someone, Melissa Troutman, perhaps on the
7 platform.

8 MS. TROUTMAN: Yes. Good morning. Can
9 you hear me?

10 THE HEARING OFFICER: Yes. Thank you.
11 Would you spell your first and last name, please?

12 MS. TROUTMAN: Yes. It's Melissa
13 Troutman, M-E-L-I-S-S-A T-R-O-U-T-M-A-N.
14 WHEREUPON,

15 MELISSA TROUTMAN,
16 called as a witness and having been first duly sworn
17 to tell the truth, the whole truth, and nothing but
18 the truth, was examined and testified as follows:

19 THE HEARING OFFICER: Thank you.
20 Please go ahead.

21 MS. TROUTMAN: Yeah. Good morning. My
22 name is Melissa Troutman, and I'm the climate and
23 health advocate for WildEarth Guardians. I want to
24 highlight two serious concerns with OCD's proposed
25 regulatory scheme for Class VI CO2 injection wells.

1 The first is the capacity issue related
2 to staffing and funding for the program. Particularly
3 as Guardian stressed in its opening remarks, the post-
4 permitting oversight and enforcement phase. Fast
5 tracking the permitting of Class VI injection wells
6 intended for permanent CO2 storage without a long-term
7 plan to ensure adequate staffing and funding for
8 comprehensive oversight is an unacceptable hope for
9 the best approach that puts the health, environment,
10 and lives of New Mexicans at risk for the sake of
11 OCD's desire for regulatory efficiency. For this
12 reason, the Commission should deny OCD's rulemaking
13 petition.

14 The Guardian's second cause for concern
15 with fast tracking the permitting of Class VI
16 injection wells stems from OCD's continuing struggle
17 to oversee New Mexico's existing oil and gas waste
18 system, including injection wells. A system
19 characterized by thousands of spills, recurring
20 pollutions, and limited enforcement.

21 The scale of OCD's failure to
22 effectively manage its existing regulatory programs is
23 staggering. Just two weeks ago, WildEarth Guardians
24 released its Q2 waste watch analysis documenting
25 17,373 reported oil and gas spills during the first

1 half of this year. That's an average of 96 spills
2 every day, or roughly one reported spill every 15
3 minutes.

4 Operators -- operators reported
5 spilling more than 4.5 million gallons of liquid oil
6 and gas waste in the first six months of this year,
7 with more than 1.5 million gallons of those lost into
8 New Mexico's surrounding soil and waterways.

9 The report also found that enforcement
10 remains limited despite tens of thousands of reported
11 spills each year, many of which are happening at
12 injection wells.

13 Before OCD rushes to take on
14 responsibility for permanently storing industrial
15 carbon waste underground through a new regulatory
16 program, it needs to first demonstrate to New Mexicans
17 and the Commission that it can effectively oversee the
18 oil and gas waste system it already regulates.

19 Unless and until OCD does this and
20 reverses its failing track record on oversight and
21 enforcement, the Commission cannot allow the Division
22 to take on yet another regulatory program that is
23 unable to fully oversee and enforce. Thank you.

24 THE HEARING OFFICER: Thank you,
25 Ms. Troutman.

1 Is there anyone else on the platform
2 who would like to offer public comment at this time?
3 The next opportunity will be at nine o'clock tomorrow
4 morning. I see Andrew Forkes-Gudmundson from
5 Earthworks. Let's see here.

6 I think you need to allow his
7 microphone, Sheila.

8 MR. FORKES-GUDMUNDSON: Hi. Can you
9 hear me?

10 THE HEARING OFFICER: Yes. Thank you.
11 Would you spell your first and last names, please?

12 MR. FORKES-GUDMUNDSON: Yes. Only if
13 it doesn't count against my three minutes.

14 THE HEARING OFFICER: No.

15 MR. FORKES-GUDMUNDSON: My -- my name
16 is Andrew Forkes-Gudmundson. It's A-N-D-R-E-W,
17 Forkes-Gudmundson. It's F-O-R-K-E-S, hyphen, G-U-D-M-
18 U-N-D-S-O-N.

19 WHEREUPON,

20 ANDREW FORKES-GUDMUNDSON,
21 called as a witness and having been first duly sworn
22 to tell the truth, the whole truth, and nothing but
23 the truth, was examined and testified as follows:

24 THE HEARING OFFICER: Please go ahead.

25 MR. FORKES-GUDMUNDSON: Thank you. My

1 name is Andrew Forkes-Gudmundson. I'm the senior
2 manager for state policy at Earthworks. In my role, I
3 work on a variety of issues across New Mexico,
4 Colorado, Pennsylvania, and Texas related to the oil
5 and gas industry and other associated projects. And I
6 wanted to speak to you today -- today about a specific
7 issue that many of those states are grappling with.
8 And that's bonding in the context of these Class VI
9 well proposals.

10 Bonding is important because whatever
11 you think of the idea of carbon sequestration, these
12 projects will eventually close and will eventually
13 need to be cleaned up and remediated. And that will
14 always cost money.

15 Bonding is the tool, or a tool, that
16 states use to ensure that taxpayers aren't left on the
17 hook paying for all of those cleanup costs. A bond at
18 its most basic is a promise to pay. But -- but most
19 importantly, it's a promise by someone else to pay.

20 In the oil and gas world, or any of the
21 similar spaces, bonds are used to make sure that if an
22 operator goes bankrupt or is, for some other reason,
23 unable to pay for the cleanup costs at the end of a
24 site's life, the bonding company will pay instead.

25 Self-bonding, or self-insuring,

1 completely defeats the purpose of bonding. It takes
2 the idea of the bond and turns it literally into just
3 a promise to pay, but without the vitally important
4 third-party guarantee.

5 Self-bonding never works. These
6 projects are far too expensive and far too complex to
7 clean up to the point where they were -- they will
8 require decades of ongoing monitoring and maintenance
9 to rely on what is functionally a pinky promise.

10 We watched self-bonding fail before.
11 In the coal industry, three of the largest operators
12 went bankrupt in 2015, 2016 after self-bonding
13 hundreds of millions of dollars of remediation
14 obligations, leaving taxpayers holding the bag.

15 We also just wrapped up a year's long
16 process to fix the broken bonding system at the Oil
17 Conservation Division for oil and gas companies that
18 allowed them to avoid responsibility for cleaning up
19 the wells at their end of their lifespan.

20 Let's make sure we learn from these
21 lessons from the past and put our best foot forward as
22 the state grapples with these Class VI well proposals.
23 I strongly urge you to remove self-bonding as an -- as
24 an option for these projects and require instead real
25 bonding with real independent financial instruments

1 and make sure that these projects are managed well
2 through the end of their lifespan.

3 Thank you very much for your
4 consideration and for your work on these important
5 rules.

6 THE HEARING OFFICER: Thank you very
7 much.

8 Is there anyone else on the platform
9 who would like to offer non-technical public comment
10 at this time? The next opportunity is 9 a.m.
11 tomorrow.

12 Anyone else on the platform, Sheila?
13 No.

14 THE CLERK: No, I don't see anybody
15 else.

16 THE HEARING OFFICER: All right. Is
17 there anyone in the room that would like to offer
18 public comment? No.

19 All right. We're going to move back to
20 the technical case now. When we broke yesterday
21 afternoon, we had heard from all of the Division's
22 witnesses, and the Division chose to create two panels
23 for the purposes of cross-examination.

24 Is there anything before I invite
25 cross-examination?

1 MR. TREMAINE: Not at this time, Madam
2 Hearing Officer.

3 THE HEARING OFFICER: All righty. So
4 we have Dr. Khaniani and Dr. Wang. Let's see.
5 Mr. Tucker, if you would.

6 MR. TUCKER: Thank you. Oxy actually
7 does not have any questions for this panel. Thank you
8 very much.

9 THE HEARING OFFICER: All right. Thank
10 you. NMOGA. Ms. Gutierrez, are you on the platform?

11 MS. GUTIERREZ: I am. Good morning.
12 No cross-exam from us either. Thank you.

13 THE HEARING OFFICER: All right. Thank
14 you.

15 Ms. O'Grady?

16 MS. O'GRADY: Good morning, Madam
17 Hearing Officer. Let me have just one moment, please,
18 to pull up my notes.

19 THE HEARING OFFICER: Okay.

20 MS. O'GRADY: Apologies.

21 THE HEARING OFFICER: And then you have
22 an hour.

23 MS. O'GRADY: Thank you.

24 //

25 //

1 CROSS-EXAMINATION

2 BY MS. O'GRADY:

3 MS. O'GRADY: Good morning. My name is
4 Morgan O'Grady, and I represent the conservation
5 groups. How are you guys today?

6 DR. WANG: Good morning. I'm doing
7 okay. Thank you.

8 DR. KHANIANI: Yeah, I'm doing okay
9 too.

10 MS. O'GRADY: Good. Thank you so much.

11 Dr. Khaniani, you specified on your
12 demonstrative slide 6 that Class VI applicants must
13 characterize known or suspected faults or fractures;
14 correct?

15 DR. KHANIANI: Correct.

16 MS. O'GRADY: And you specified in your
17 direct testimony on page 3 that faults are heavily
18 scrutinized based on 3D seismic data because they can
19 act as a natural pipeline to allow movement of fluids
20 and potentially underground sources of drinking water
21 contamination. Yes?

22 DR. KHANIANI: Yes.

23 MS. O'GRADY: Is it possible that there
24 could be unknown faults in the area?

25 DR. KHANIANI: It is definitely

1 possible that there will. Because the data that we
2 have, 3D seismic data, we have uncertainty in the
3 event. It -- it is also the possibility because there
4 is an uncertainty, always some sort of uncertainty,
5 finding all of the faults.

6 MS. O'GRADY: That makes sense. Thank
7 you. But just to clarify, OCD witnesses do oppose
8 Conservation Group's proposal that would require 3D
9 seismic characterization of the full AoR?

10 DR. KHANIANI: Can you repeat that
11 again?

12 MS. O'GRADY: Of course. OCD witnesses
13 oppose Conservation Group's proposal that would
14 require 3D seismic characterization of the full area
15 of review.

16 DR. KHANIANI: What is that based on?

17 MS. O'GRADY: I can pull up testimony.
18 Give me just a moment. Thank you.

19 Dr. Schnarr's testimony on page --
20 rebuttal testimony on page 17 states that mandatory 3D
21 seismic characterization may be necessary and
22 appropriate in some cases. And in others, may be
23 infeasible or provide little additional value while
24 significantly increasing project costs and permitting
25 timelines.

1 Are you familiar with this testimony of
2 his?

3 MR. TREMAINE: Madam Hearing Officer,
4 Dr. Cunningham did not prepare Dr. Schnarr's rebuttal
5 testimony. So if he -- he's prepared to answer
6 questions about the 3D seismic and modeling, et
7 cetera.

8 So soft objection. If it -- I believe
9 it may be outside the scope of his testimony.

10 THE HEARING OFFICER: Yeah. Thank you,
11 Ms. O'Grady.

12 MS. O'GRADY: That's fair. Thank you.

13 BY MS. O'GRADY:

14 MS. O'GRADY: So I guess as a follow-up
15 question, Dr. Khaniani, since there is uncertainty in
16 the modeling and there may be unknown faults in the
17 area of review, or potential area of review, would you
18 support full modeling through -- or 3D seismic
19 modeling of the full area to ensure that there are no
20 unknown faults?

21 DR. KHANIANI: Definitely I support use
22 of the full characterization and use all of the
23 available resources we have.

24 I also want to have a comment about
25 some area, the -- they may have less uncertainty

1 regarding the existing the fault because they may have
2 less technical -- tectonical tension and the --
3 present the fault may be less than in some other
4 areas. So maybe that helps.

5 But -- and definitely, we should have a
6 full characterization of the -- I mean, a study there
7 with all of the possible data that we can get and
8 analyze the subsurface to ensure the safety.

9 MS. O'GRADY: Okay. Thank you.
10 Another question for you, Dr. Khaniani. You define
11 the pressure front on your demonstrative slide 4 as
12 being how injection pressure spreads beyond the plume.

13 DR. KHANIANI: Correct.

14 MS. O'GRADY: Does the pressure front
15 have an obvious edge or end?

16 DR. KHANIANI: No. It's always has a
17 transition. It's -- it's based on the diffusion
18 equation. It's not like a straight line. Yeah.

19 MS. O'GRADY: Thank you. So could two
20 operators potentially define that pressure front and
21 where it stops causing endangerment to underground
22 sources of drinking water? Could two operators define
23 that differently?

24 DR. KHANIANI: At most they -- they
25 will have some certainty in the boundary, but that

1 will be very close.

2 MS. O'GRADY: Another question for you.
3 Plumes migrate once they're underground and modeling
4 carries some uncertainty.

5 DR. KHANIANI: Sure.

6 MS. O'GRADY: And there's fault
7 modeling before a permit is issued.

8 DR. KHANIANI: Yes.

9 MS. O'GRADY: Could a permit be
10 approved in an area with a known fault?

11 DR. KHANIANI: With an unknown fault,
12 you say?

13 MS. O'GRADY: With a known fault.

14 DR. KHANIANI: Okay. So it has a
15 different process. The first one is identifying of
16 the fault. And the next step is to perform numerical
17 modeling. And in the numerical modeling, we usually
18 simulate the plume extension during several years. It
19 depends on the length of the project.

20 And you anticipate -- based on the
21 risk, you anticipate if the fault -- if your plume
22 reaches to the fault. And then if reaches to the
23 fault, does it migrate? And those are not, like, a
24 straight answer I can give.

25 MS. O'GRADY: No, that's helpful.

1 Thank you. So the likelihood of the plume to reach a
2 fault and activate that fault is based on the
3 modeling?

4 DR. KHANIANI: Yes. Based on the
5 modeling in different aspect, one is reservoir
6 engineering, like fluid flow through the porous
7 medium, how -- how much it reaches. The second one
8 is, okay, what pressure you are activating to the
9 surface of the fault.

10 And you also need to understand the
11 fault system itself. And if the pressure activation
12 is sufficient to activate the fault. And if -- if it
13 is sufficient to activate the fault, then what is the
14 slippage potential? And yes, that is the process.

15 MS. O'GRADY: Given the uncertainty in
16 modeling, is it possible the plume could migrate in an
17 unexpected direction or manner and encounter a fault
18 and activate it unexpectedly?

19 DR. KHANIANI: It is if the data says
20 that we have -- because this is like a what, Class VI.
21 If the data said that we have -- has uncertainty and
22 the uncertainty is updated during the time, and then
23 you can predict if your information is wrong or is
24 false, then you can predict the plume in a --
25 obviously in a wrong position that it should be.

1 So it depends on the data set that you
2 have. You predict the data based on -- you predict
3 the result based on the data that you have. I would
4 say it depends on the quality of your data and the
5 structure of subsurface as well.

6 MS. O'GRADY: Is it possible that the
7 data could be -- you could be gathering data, but you
8 might not hit that first two-year mark where you have
9 to review your area of review? And so you may have
10 new data that would inform your modeling, but you
11 haven't shifted your area of review and your planning
12 yet?

13 DR. KHANIANI: Can you specify about
14 this?

15 MS. O'GRADY: Yeah. Sorry. I didn't
16 ask that very clearly. You say that the -- you
17 predict that the result based on the data that you
18 have. And so whether the certainty of your modeling
19 depends on the quality of your data and the structure
20 of your modeling.

21 DR. KHANIANI: Yes.

22 MS. O'GRADY: However, my -- is it
23 correct that an area of review is not first
24 reevaluated until after two years under the Division's
25 proposals?

1 DR. KHANIANI: This is in general.
2 I -- I have no comment on that because everything can
3 be possible. But it depends how we gather the data
4 initially.

5 MS. O'GRADY: Okay. Thank you.
6 Dr. Khaniani, you state that third-party verification
7 is not necessary because both the Division and the
8 public have the opportunity to review the permit
9 application and the technical details.

10 DR. KHANIANI: Correct.

11 MS. O'GRADY: Are you aware that permit
12 applications are redacted prior to circulation to the
13 public during the public comment period?

14 DR. KHANIANI: Can you explain more
15 about that?

16 MS. O'GRADY: Yeah. So would it
17 surprise you that some information in a permit may be
18 claimed by that permit applicant as confidential
19 information that they do not want to have released to
20 the public, so that information would be blacked out
21 or removed from the application before it is
22 circulated?

23 DR. KHANIANI: I'm -- I'm not sure
24 about the -- that one.

25 MS. O'GRADY: If some information were

1 removed from the permit application or redacted from
2 the permit application before circulation to the
3 public, could a member of the public evaluate the
4 technical merits of the modeling?

5 DR. KHANIANI: So based on the permit
6 application, usually they -- they place a lot of
7 information. I believe that is necessary to evaluate
8 the -- the process that has been done by -- by the
9 permit. That -- that's what I -- I can say.

10 MS. O'GRADY: Thank you.

11 DR. KHANIANI: Yeah.

12 MS. O'GRADY: Okay. That's all that I
13 have for you guys today. Thank you so much. Really
14 appreciate both of your time.

15 DR. WANG: Thank you.

16 THE HEARING OFFICER: Thank you,
17 Ms. O'Grady.

18 Mr. Pavlik, do you have questions? Are
19 you on the platform?

20 MR. PAVLIK: Yes. Good morning. I do.

21 CROSS-EXAMINATION

22 BY MR. PAVLIK:

23 MR. PAVLIK: Good morning, Dr. Khaniani
24 and Dr. Wang. My name is Zach Pavlik. I represent
25 the Center for Biological Diversity. I really

1 appreciate your time this morning.

2 I think these questions will probably
3 be best directed at Dr. Khaniani, but yeah, we'll
4 start there and see -- we might have a few that will
5 be relevant to you as well, Dr. Wang.

6 So in your direct testimony, you --
7 actually, I'm going to start with Dr. Wang, just based
8 on your direct testimony.

9 In your direct testimony, you outline
10 what an injection zone is in the Class VI context.
11 And I'm curious, can a historic oil and gas field or
12 reservoir serve as a confining zone for permanent
13 storage of CO₂?

14 And sorry, if that comes from --

15 MR. CHANG: Could we --

16 MR. PAVLIK: Sorry. Go ahead.

17 MR. CHANG: Could we ask the Counsel to
18 repeat the question? Because I'm -- it didn't come
19 through very clearly for us.

20 THE HEARING OFFICER: It was a little
21 choppy, Mr. Pavlik.

22 MR. PAVLIK: Oh, sure. Let me see if I
23 can adjust my sound here.

24 BY MR. PAVLIK:

25 MR. PAVLIK: Okay. Yes. Dr. Wang, in

1 your direct testimony, you outline what an injection
2 zone is in the Class VI context. Can a historic oil
3 and gas field or reservoir serve as a confining zone
4 for permanent storage of CO₂?

5 DR. WANG: So what I'm hearing is that
6 the oil and gas production zone can be served as the
7 injection zone. Is that correct?

8 MR. PAVLIK: Yes. In this case, I'm
9 curious about the former oil and gas production zone.

10 DR. WANG: That's the depleted oil and
11 gas production zone; right? If my understanding is --

12 MR. PAVLIK: Correct. Correct.

13 DR. WANG: Technically, yes.

14 MR. PAVLIK: Okay. And in your
15 opinion, is this depleted oil or gas production zone a
16 strong location to site the Class VI injection well?

17 DR. WANG: Could you please repeat your
18 question? Sorry.

19 MR. PAVLIK: Sure. Is it -- are you
20 able -- is the audio any better? I can try taking my
21 headphones out if it's an audio problem.

22 THE HEARING OFFICER: That might
23 improve things.

24 MR. PAVLIK: Okay. Thank you. Okay.
25 Is that any better?

1 THE HEARING OFFICER: It is less
2 scratchy. Just increase the volume.

3 MR. PAVLIK: I'm sorry. I'm sorry
4 about this.

5 THE HEARING OFFICER: Yeah.

6 MR. PAVLIK: I'll have to get this
7 sorted.

8 BY MR. PAVLIK:

9 MR. PAVLIK: Yeah, so Dr. Wang, I am
10 curious that -- in your opinion, is this depleted oil
11 and gas reservoir, is that a strong location for a
12 site -- a Class VI injection well?

13 DR. WANG: It depends. You know, based
14 on my knowledge, it doesn't matter if you have a
15 depleted oil and gas production zone or deeper saline
16 aquifer, whatever you have, you must have a detailed
17 site characterization to prove this formation is good
18 enough for the CO2 storage.

19 So I don't have a strong opinion on
20 whether those one can be a good -- a better candidate
21 or best candidate than others, but it could be a
22 candidate. Yeah.

23 MR. PAVLIK: Sure.

24 DR. WANG: Depends on your site
25 characterization.

1 MR. PAVLIK: Okay. Thank you.

2 DR. WANG: Yeah.

3 MR. PAVLIK: Thank you. Yeah, that
4 makes sense. And also, you note in your summary of
5 your direct testimony that comprehensive site
6 characterization can reduce uncertainty.

7 I'm curious, in terms of Class VI
8 permanent CO2 injection in historic depleted oil or
9 gas fields, or geologically connected locations, do
10 those pose unique considerations for site
11 characterization?

12 DR. WANG: My answer will be yes. You
13 also need a detailed site characterization. Yes. To
14 reduce uncertainty because you already produced the
15 oil and gas for years, and the reservoir probably
16 already changed during the production period. And
17 your initial reservoir conditions, parameters, already
18 altered for this production period.

19 So technically, I will suggest to
20 perform the detailed site characterization again on
21 this depleted oil and gas reservoir. That's my
22 opinion.

23 MR. PAVLIK: Thank you.

24 DR. WANG: Thank you.

25 MR. PAVLIK: And as part of that site

1 characterization, are there additional considerations
2 or concerns that come into play with a depleted oil or
3 gas field?

4 DR. WANG: You mean for the regulation
5 portion or for the logging or testing or --

6 MR. PAVLIK: Of course. I think I'm
7 thinking more in terms of site characterization.

8 DR. WANG: I can't speak for the
9 logging core and the sampling, those portion. Doesn't
10 matter if -- if you have a depleted oil and gas
11 reservoir, you have to follow -- follow the order,
12 follow the rules from EPA, from the NDAC, the proposed
13 rules if you got approved this time and follow those
14 rules and do this kind of site characterization on the
15 logging core and the testing.

16 MR. PAVLIK: Okay.

17 DR. WANG: Doesn't matter if you have
18 previous data already. Things always change during
19 the production; right? That's my technical point of
20 view.

21 MR. PAVLIK: Thank you. Appreciate it.

22 DR. WANG: Yeah.

23 MR. PAVLIK: And in terms of
24 considerations involved in a depleted oil or gas
25 field, do those considerations when siting a Class VI

1 well in a depleted field, do they include an increased
2 chance of leakage or risk of leakage of injected CO₂?

3 DR. WANG: That is all of my knowledge.
4 I'm going to defer this one to probably my team
5 member, Matt, who is working on the testing and
6 monitoring plan for this proposal.

7 MR. PAVLIK: Okay. And Dr. Khaniani,
8 is that something that you would have the expertise to
9 speak to in terms of an injection zone or reservoir
10 and how perforations may affect that?

11 DR. KHANIANI: As I said earlier, all
12 the evaluation for any site need to be evaluated based
13 on geomechanical reservoir. And the possibility we
14 have to do modeling, use enough data to make the
15 conclusion.

16 So based on your question, if the
17 depleted reservoir affect the injection zone, we have
18 to evaluate based on the modeling step that we have.
19 So my answer will be we need to study any case by
20 case. So we cannot give a general answer.

21 DR. WANG: Excuse me. Could I add a
22 little bit else?

23 MR. PAVLIK: Sure.

24 DR. WANG: If -- for the depleted oil
25 or gas production area, this formation in this area,

1 if there any leakage or potential risk existing. So
2 under the site characterization there is a correction,
3 gradual action plan included for that portion. So for
4 more details, I would defer to Matt or to my team
5 members for the next technical session. Yeah. Thank
6 you.

7 MR. PAVLIK: Okay. Thank you for your
8 answer.

9 And I guess, Dr. Khaniani, I'll just
10 continue briefly with you. In terms of the site
11 characterization, and you mentioned the need to study
12 a zone regardless of the -- I guess the
13 characterization, what that might show. In your
14 opinion, would an injection zone that was a historic
15 oil or gas field pose additional risks of leakage?

16 DR. KHANIANI: As I said, we need to
17 study each case by case. It can -- it can and it
18 cannot. So I cannot say specifical. We need to study
19 that for any -- any reservoir.

20 MR. PAVLIK: And any -- is it true that
21 any perforation into a CO2 injection zone poses
22 additional risk potentially of effective containment
23 of stored CO2?

24 DR. KHANIANI: Again, it needs modeling
25 to evaluate. So perforation, you can inject the

1 material inside. It can affect the skin. It can
2 affect the environment. Maybe it improve or maybe it
3 has a different outcome. So we need to study for any
4 well if the -- if a perforation has adverse effect.

5 MR. PAVLIK: And so am I -- excuse me.
6 Am I understanding you correctly that if there were a
7 historic oil or gas field that had many different
8 wells that were perforating an injection zone, that
9 would require additional study for each of those
10 wells?

11 DR. KHANIANI: Do you want to answer?

12 DR. WANG: I will say yes.

13 MR. PAVLIK: Okay. Thank you. And
14 then in that case, with the additional study required
15 for those wells perforating that injection zone, would
16 that -- would each of those wells be a potential
17 leakage pathway that need to be studied?

18 DR. WANG: That's -- that is all the
19 evaluation and action atoms, and there is a
20 corrective action plan for the site characterization.
21 So if you need more information, probably query from
22 Greg from the next technical session could provide
23 more information on those. Yeah.

24 MR. PAVLIK: Okay. And just briefly,
25 what you're saying is that, if I understand correctly,

1 each one of those wells that perforates the injection
2 zone, because it perforates the injection zone, would
3 require a study of whether that poses a risk. And
4 you're offering that we would then need to do site
5 characterization and potential corrective action for
6 each of those wells. Is that correct?

7 DR. WANG: That's correct.

8 MR. PAVLIK: And would this sort of a
9 challenge, or would this need for study of corrective
10 action, also be the case in an active oil or gas
11 reservoir field?

12 DR. WANG: That's really out of my
13 scope. Sorry about that.

14 MR. PAVLIK: Okay. And the -- maybe
15 the last question that I'll have for either of you.
16 In your -- in your opinion, based on site
17 characterization, modeling, logging, would an active
18 oil or gas field or reservoir serve as an effective
19 injection zone for long-term sequestration of carbon
20 dioxide?

21 DR. WANG: So my understanding, you are
22 trying to -- if you're going to do that operation, so
23 you're going to convert to the Class II well, CO₂ UR
24 well, not a CCUS. That's my understanding. So that's
25 a confusion for me on those two type of wells. If

1 you're going to do that to a -- in the active oil and
2 gas reservoir. Okay. That's my understanding from
3 your question.

4 MR. TREMAINE: Madam Hearing Officer.

5 MR. PAVLIK: Okay. Thank you.

6 MR. TREMAINE: So again, a soft
7 objection. I think that Mr. Pavlik is not -- I don't
8 believe that Mr. Pavlik is trying to elicit a legal
9 response, but this is a question that has both a
10 technical and a legal answer.

11 So we're veering into territory where
12 there is a technical criteria or answer where whether
13 an active production zone could serve as a confining
14 layer or a confining zone. However, it implies a
15 legal analysis on whether or not that would be
16 permissible.

17 So I just want to caution there because
18 it's come up twice. And I'm -- I think to the extent
19 that it's calling for a technical answer, the witness
20 should answer.

21 THE HEARING OFFICER: All right. Thank
22 you, Mr. Tremaine, for putting in -- that on the
23 record.

24 I'm certain, Mr. Pavlik, you understand
25 that these are not lawyers you're questioning. So

1 we'll just leave that as a place marker there. Do you
2 have other questions of Dr. Khaniani or Dr. Wang?

3 MR. PAVLIK: Yes. Yeah. Thank you. I
4 appreciate that.

5 HEARING OFFICER: Okay.

6 BY MR. PAVLIK:

7 MR. PAVLIK: I do briefly want to ask a
8 similar or, I guess, a summary of what you just said,
9 Dr. Wang. So only speaking, please, to the technical
10 aspects of a Class VI injection well.

11 Are you saying that in terms of its
12 technical components, a Class VI injection well would
13 not be appropriately located in an active oil or gas
14 field? That would instead be a Class II injection
15 well?

16 DR. WANG: Technically -- so I'm not
17 sure how I'm -- how I'm going to answer this question
18 from the technical aspect, you know. So basically, if
19 you're going to inject CO2 to a oil production zone,
20 that automatically goes to the enhanced or recovery.
21 That's definitely have some storage components there.
22 But how are you going to define your permit to a Class
23 VI?

24 MR. PAVLIK: I see. So if I'm
25 understanding correctly -- I guess maybe a question to

1 clarify. Are you suggesting that this would be a
2 Class II instead of a Class VI well because it --
3 though it has some storage aspects, it is not the
4 permanent storage of that carbon dioxide? It's used
5 for enhanced oil recovery. Is that correct?

6 MR. TREMAINE: Objection to form. And
7 outside the scope of Dr. Wang's testimony. If --
8 Dr. Wang is not testifying about Class II, and this
9 hearing is not about Class II. So we're getting into
10 production zones. Dr. Wang's testimony relates to
11 logging, testing, et cetera.

12 THE HEARING OFFICER: I understand the
13 temptation, Mr. Pavlik, but I have to ask you to stay
14 within the scope of the Class VI testimony we're heard
15 today.

16 MR. PAVLIK: Okay. Thank you.

17 BY MR. PAVLIK:

18 MR. PAVLIK: So Dr. Wang, I guess,
19 let's stick away from Class II. I know that you had
20 brought that up in answer to my question, but just
21 Class VI wells, focusing on those. Technically
22 speaking, is an active oil or gas reservoir an
23 appropriate location for a Class VI injection well?

24 DR. WANG: This is out of my scope.
25 Sorry. I can't -- I don't know the -- and I don't

1 have a firm answer for you.

2 MR. PAVLIK: Dr. Khaniani, would this
3 be something that -- as you're looking at injection
4 zones and characteristics, in your opinion, would a
5 Classic VI well be appropriately situated within an
6 active, no longer depleted, but an active oil and gas
7 correction zone?

8 DR. KHANIANI: I will repeat the answer
9 that I gave. So every situation, we have to perform
10 modeling for the injection and production and
11 inclusion of the other wells. So we need to perform
12 simulation and modeling. And make decision based on
13 the -- the modeling and engineering model that we
14 have. We cannot make a -- like a general comment on
15 this question.

16 MR. PAVLIK: And so -- excuse me. If
17 I'm understanding you correctly, in your opinion, it
18 may be appropriate to locate a Class VI injection well
19 in an actively producing oil or gas field. Is that
20 correct?

21 DR. KHANIANI: My honest answer is yes.
22 Maybe.

23 MR. PAVLIK: Thank you both. That's
24 all I have. I appreciate it.

25 THE HEARING OFFICER: All right. Thank

1 you, Mr. Pavlik.

2 Ms. Ruscavage-Barz?

3 MS. RUSCAVAGE-BARZ: Madam Hearing
4 Officer, WildEarth Guardians has no questions for
5 these witnesses.

6 THE HEARING OFFICER: All right.

7 MS. RUSCAVAGE-BARZ: Thank you.

8 THE HEARING OFFICER: Thank you.

9 Mr. Tremaine, do you have any redirect?

10 MR. TREMAINE: Yes. I believe I have
11 one or two questions.

12 REDIRECT EXAMINATION

13 BY MR. TREMAINE:

14 MR. TREMAINE: Dr. Khaniani, is -- were
15 you responsible for drafting the confidentiality
16 provision in the rule?

17 DR. KHANIANI: Drafting? No.

18 MR. TREMAINE: Okay. And I think you
19 clarified that you are not an attorney; correct?

20 DR. KHANIANI: Yes.

21 MR. TREMAINE: Okay. In terms of
22 implementation of the specific -- you received
23 questions about confidentiality. Is it fair to say
24 that questions about how the confidentiality
25 provisions work would be better addressed to certain

1 respects to the next panel or legal argument?

2 DR. KHANIANI: Yes.

3 MR. TREMAINE: Thank you. One moment.
4 No further redirect.

5 THE HEARING OFFICER: All right. Thank
6 you, Mr. Tremaine.

7 We turn now to the Commissioners.
8 Commissioner Ampomah, would you like to begin the
9 questioning?

10 DR. AMPOMAH: Probably ask Ms. Czoski
11 to see if she wants to go first. I'll go first on the
12 second panel.

13 MS. CZOSKI: Yeah. I can go first.
14 That's fine.

15 CROSS-EXAMINATION

16 BY MS. CZOSKI:

17 MS. CZOSKI: Thank you both for your
18 time this morning. I will start with questions for
19 Dr. Wang. Or if -- if it's for Dr. Khaniani, please
20 feel free to jump in.

21 One of the questions I have is that
22 logging, sampling, and testing is defined to say that
23 you only need to do that for relevant geologic
24 formations. And I'm wondering what are those relevant
25 geologic formations?

1 DR. WANG: So under the proposed rules,
2 there are several components for the logging portion.
3 Specifically for the surface casing portion, we need
4 to identify the USDW. And do -- perform the gamma
5 ray, resistivity, SP log, and caliper logs before the
6 casing installed. Okay?

7 The casing portion, the surface
8 portion, the main function is to protect the lower
9 most of USDW. So these kind of logs can help us
10 identify those kind of formation and prove -- provide
11 a baseline data set for the future evaluation after
12 the --

13 And then for the -- before and upon the
14 installation with the long-string casings, we also
15 need the open hole wire logs and case the hole wire
16 logs to evaluate the confining zone and the injection
17 zones. Okay?

18 Those kind of logging -- and testing
19 can provide the baseline dataset for this CCUS project
20 developed by the operator and then compare the dataset
21 for the future injection.

22 I will not list all those kind of
23 logging suit to names to save some time right here.
24 Thank you.

25 MS. CZOSKI: So do you think it would

1 be useful to do a full suite of logs for the entire
2 well section and not just the injection in the
3 confining zones to get a better understanding of all
4 the different possible mineral resources or hazards
5 through that whole area?

6 DR. WANG: You mean from the surface to
7 the bottom-hole, the whole -- of the wellbore? Do all
8 those kind of fulfill the logging program?

9 MS. CZOSKI: Yeah. Just to log the
10 entire -- the entire -- from the surface down to the
11 injection zone.

12 DR. WANG: To me, the most important --
13 technically, the most important portion is the water
14 aquifers and the confining zones and the injection
15 zones. Other formations will be the additional
16 information for the wellbore. It's not under the
17 strict requirement for -- from this rule, but
18 technically I would recommend those rules -- those log
19 suit. Yeah. If you -- if -- if allowed, yes.

20 MS. CZOSKI: And what about, let's say,
21 like, formation fluid testing? Is that only required
22 in the reservoir, or would that be required in maybe
23 areas to understand if there's high H₂S, which could
24 cause more corrosion, or to understand the -- the
25 salinity in different water intervals as you're

1 drilling through?

2 DR. WANG: At least to the confining
3 zones and injection zones, and also from the water
4 aquifers, at least.

5 MS. CZOSKI: Okay. Thank you. Let's
6 see. This might be a question for both of you. I
7 know for the initial permit, you have to look at the
8 geomechanical properties. And I was wondering if
9 during the logging time before the injection is
10 permitted, would you want to get -- would the OCD want
11 to ask for having in-situ stress magnitude in
12 orientation directions?

13 DR. KHANIANI: So your question is, if
14 OCD will ask the in-situ stress orientation?

15 MS. CZOSKI: Yeah. Right now, I don't
16 think it's set out in the rule for asking for that
17 information. I was just wondering if that would be a
18 useful thing to have in the rule?

19 DR. KHANIANI: I think it will be a
20 good idea.

21 MS. CZOSKI: Okay. Thank you.

22 DR. KHANIANI: Because those are --
23 currently what we have right now is for New Mexico and
24 Texas, there are lots of publication that they discuss
25 about the in-situ stress, the direction, and also

1 density. We can take advantage of that. And I think
2 that's a good idea.

3 MS. CZOSKI: Yeah. Those are a good
4 starting point for sure. And then actually get in-
5 situ while -- while they're drilling the well to
6 understand exactly what's happening at the wellbore.
7 Let's see.

8 DR. WANG: So I remember -- if I
9 remember correct, we have the MWD, the Maryland Well
10 Drilling. We have some memoranda for the -- from the
11 drill bit on the stress or some pressure monitoring.
12 Will that be useful for the in-situ stress analysis?
13 Something like that. Yeah, that's my suggestion on
14 those. Yeah.

15 MS. CZOSKI: Okay. Yeah. Thank you.
16 And let's see. So a little bit about the well
17 construction. It seems like the minimum for the rule
18 is only two strings of casing, one at the -- one at
19 more of the surface and then one for the rest of the
20 wellbore. Do you think that is sufficient or do you
21 think there should be a higher standard to begin with?

22 DR. KHANIANI: I think we should --

23 DR. WANG: For more detail, I would
24 defer this question to Matt. But from my technical
25 point of view, surface section -- surface casing is

1 for protecting USDW.

2 And then in terms of the casing, it is
3 for the wellbore, you know, the stuff right there.
4 And then protective casing is for protect the --
5 providing the isolation; right? So it depends on the
6 well depths and casing materials and cement strengths,
7 you know.

8 So that's all the engineer design
9 aspects from here in this NDAC Rules we proposed right
10 here. At least we follow the minimum requirement and
11 add on the specific site characterization required
12 dataset into that one to have a stress analysis on the
13 well casing design and wellbore diagram, and make sure
14 there's no leakage, no burst, or all this kind of
15 techniques going to happen. It should be fine. Yeah.
16 That's my technical point of view.

17 MS. CZOSKI: Okay. Thank you. So
18 yesterday in your talk, I believe you were talking
19 about monitoring for corrosion while the injection is
20 occurring, like corrosion in the cement or in the
21 wellbore. I was wondering, is there a way for the
22 operator to monitor for corrosion after the injection
23 period?

24 DR. WANG: So again, I will defer this
25 question to Matt on the testing and the monitoring

1 plan. But I do believe we have a material technology
2 to perform this kind of monitoring for the cement.
3 Yes. At least we have CBL/VDL at the beginning. And
4 then the -- the casing inspection and then the
5 pressure test. I don't know if there's any other
6 additional requirement from the testing monitoring
7 plan, but I believe so. Yeah. It should be there.

8 MS. CZOSKI: Okay. Thanks. And I
9 don't know, maybe this isn't -- maybe you're not the
10 right person for this either. But I know for the well
11 design, there has to be information provided about the
12 safety of the cement and the -- all the tubular and --
13 and everything.

14 Do you think that there should be
15 laboratory testing of the cement with exactly the
16 chemistry of what the CO2 is going to be injected to
17 better understand the corrosion possibilities?

18 DR. WANG: So the -- the Science
19 Society and the -- society already did a lot of
20 research on the CO2 releasing cement. And also the
21 commercial provider of the CO2 releasing cement, they
22 already did those kind of preliminary lab tests, which
23 is required from my previous Class VI permit
24 application process. So I would recommend lab test is
25 recommended for this process. Yes.

1 MS. CZOSKI: So do you think it should
2 be recommended in this rule to -- to include that
3 testing?

4 DR. WANG: To be true, that's out my
5 scope. I don't --

6 MS. CZOSKI: Okay.

7 DR. WANG: Yeah. I'm not sure. But
8 technically, we should have all those kind of lab test
9 data from the -- the service company, you know. Yeah.
10 As approved for the -- as a additional document for
11 the Class VI permit. Yeah.

12 MS. CZOSKI: Okay. Thank you. Okay.
13 I think my next questions are probably more for
14 Dr. Khaniani.

15 DR. WANG: Thank you.

16 MS. CZOSKI: I want to talk a little
17 bit about the 3D seismic. And I was wondering if you
18 don't have 3D seismic for an area, do you think you
19 could reliably characterize any faults or fractures in
20 the system?

21 DR. KHANIANI: So let's say we don't
22 have the 3D seismic. Then we will rely on geology,
23 the available data. For example, the data logging
24 that we have, there are, like, different teams;
25 geologists, reservoir engineers. We evaluate fault.

1 Still we can evaluate.

2 And based on the historical fault and
3 the in-situ stress regime, we can identify fault based
4 on the -- the data logs, and geological top. And
5 based on that, we still can characterize and model the
6 fault based on the information that we have. But it
7 will not be as more certain that if we combine it with
8 the seismic data.

9 MS. CZOSKI: Yeah. That's one of my
10 concerns is that 3D seismic isn't a requirement in
11 here because I think it is very difficult to reliably
12 characterize the reservoir without those tools.

13 And I guess kind of on the same note,
14 if you use 2D seismic data, that's still pretty
15 challenging to understand, like, the orientation and
16 direction of faults; correct?

17 DR. KHANIANI: Correct.

18 MS. CZOSKI: And 3D seismic could
19 definitely help with that?

20 DR. KHANIANI: That improve the
21 certainty of analysis.

22 MS. CZOSKI: Okay. Thank you. Let's
23 see. So in your rebuttal, you -- you addressed the 90
24 percent injection pressure. I was just wondering
25 where that 90 percent came from. Like, what's the

1 background on that? And if you know if other states
2 are also following the 90 percent guidelines in their
3 Class VI?

4 DR. KHANIANI: That 90 percent came
5 from EPA. They use it for Class VI and even Class II
6 follows that. And so it's a safety margin to --
7 because -- okay. In the terms of simulation, when we
8 do model, like a fault activation or like -- if you
9 want to model, if there will be a secondary fracture,
10 then the fracture pressure plays a role. And you --
11 we have to do the modeling. And the EPA plays 10
12 percent margin, safety margin for the -- because of
13 the uncertainty we have.

14 The reason for rebuttal was not that we
15 don't want to have, like, a higher -- like an 80
16 percent safety margin. The reason was that because of
17 the experience that, for example, a well we had
18 before, we cannot make it, like, a mandate for 80
19 percent safety margin. We have to do the modeling,
20 and then we want to stick with the current EPA that
21 already has been worked, because each reservoir has a
22 different condition.

23 And we want -- we don't want to mandate
24 80 percent safety margin. We want to put it in the
25 hand of the director to make the decision. There will

1 be a possibility that based on the data set and lots
2 of fracture and other history in there, the -- may
3 make decision and even make it 60 percent. Okay. So
4 we don't want to put it as a mandate statewide, like a
5 universal number. That's what my point was.

6 MS. CZOSKI: Is there a advantage to
7 the injecting at 90 percent rather than 80 percent?

8 DR. KHANIANI: So yeah, there --
9 it's -- it's about optimization of the injection. You
10 want to have maximum injection value in the region.
11 You want -- you want to have the pressure alleviate
12 that it is safe to go. So there will be definitely
13 advantage. That it's amount of the fluid you send
14 to --

15 MS. CZOSKI: And do you happen to know
16 if -- if any other state's Class VI programs, are they
17 all doing 90 percent as well?

18 DR. KHANIANI: I will refer this to
19 maybe Greg or Matt.

20 MS. CZOSKI: Okay. Thank you. And one
21 other question. If -- so as you're injecting, the
22 reservoir will become more pressurized; correct?

23 DR. KHANIANI: Yes.

24 MS. CZOSKI: So how often will the OCD
25 look at that increase in pressure to change the amount

1 that can -- like, the -- the amount that can be
2 injected? Does that make sense? Sorry.

3 DR. KHANIANI: I -- I would like to
4 refer that to Matt as well.

5 MS. CZOSKI: Okay. And if you're
6 injecting into zones that might already be
7 pressurized, would that affect how much you would want
8 to -- how high you'd want to inject?

9 DR. KHANIANI: Yeah. That -- that fits
10 under the category of the mechanics. I think we make
11 the calculation. We want to estimate how much
12 pressure we can have in order to make the activation a
13 fault or create a fracture. We -- we do -- we do
14 fault slip potential analysis, and that answers the
15 question how much pressure we can have, how much
16 induced pressure we can put in the reservoir. We make
17 the calculation.

18 MS. CZOSKI: And if -- if they're -- if
19 you're going to be injecting in an area that might
20 already have a high seismic background, would that be
21 something that would want to be looked at as part of
22 the review?

23 DR. KHANIANI: So we have different
24 protocols even in New Mexico, microseismic monitoring.
25 They have different monitoring mandate, and we follow

1 on that. And regardless, if we have high seismic
2 activity in the region, we need to understand what is
3 the source of the activity. And we need to also make
4 sure that that is a result of our injection.

5 And we -- after we observe the
6 monitoring, then we go for the corrective action and
7 want to make sure that it doesn't create fault. We
8 want to make sure that it's not creating, like, a
9 secondary fault that goes to USDW.

10 MS. CZOSKI: Thank you. Yeah, that
11 seems like a very important part of -- of this
12 approval process.

13 Let's see. When you're mapping faults
14 using 3D seismic, or whatever tool you end up using, I
15 think the rule only calls for looking at faults that
16 cross-cut the injection zone and the confining zone.
17 Wouldn't you want to have an understanding of all the
18 faults in the area?

19 DR. KHANIANI: So we have area of
20 review because we do estimation of how much a fault
21 will be. So if you want to go for other fault in the
22 region, if it's not relevant, we -- we don't study
23 that.

24 MS. CZOSKI: What if it's a fault
25 within the area of review that might be deeper than

1 the injection zone or the confining zone, you'd still
2 want to look at that; correct?

3 DR. KHANIANI: Again, it depends if you
4 have USDW or other zone that we don't want the fluid
5 to -- to migrate or if it doesn't affect, then if it
6 deeper, we -- we will not take care of that.

7 MS. CZOSKI: And I mean, the goal,
8 though, is to not have fluid escape the injection zone
9 at all, regardless of USDWs; correct?

10 DR. KHANIANI: Yes.

11 MS. CZOSKI: So I think it might be
12 important to look at faults in the whole area.

13 DR. KHANIANI: Yeah. And we -- we need
14 to make the simulation and make sure that if it
15 reaches and where it goes and how -- how it affects
16 it.

17 MS. CZOSKI: Okay. And I guess one
18 other kind of modeling question for you. So you said
19 that the pressure zone in the area of review has some
20 uncertainty with it. Do you think -- is that
21 uncertainty included in the area of review, or do you
22 think there should be an extra buffer zone around to
23 account for that uncertainty?

24 DR. KHANIANI: No. It definitely is
25 included in the area of review process.

1 MS. CZOSKI: And how -- how much do you
2 think that -- maybe you can't answer this, but how
3 much uncertainty is usually tacked on? Do you know?

4 DR. KHANIANI: I have not in my -- my
5 thought for now, but they have different, like a
6 calibration, history matching. And they want to make
7 sure that -- because this -- like a Class VI, you will
8 get new data during the time, and you want to put that
9 in your evaluation and as a standard for reservoir
10 engineering to evaluate that. But if you need a
11 specific number of uncertainty, maybe Dr. Wang or Matt
12 can answer that.

13 MS. CZOSKI: Okay. Do you think -- do
14 you think adding a -- an extra buffer on there would
15 be a good idea just to add some extra room, wiggle
16 room, if things move faster or differently than you
17 expect?

18 DR. KHANIANI: I believe we have to
19 stick on the modeling and the data. I think we cannot
20 put universal extra margin. We need to stick with the
21 simulation that we have of modeling and make sure that
22 everything is safe within the standard. But sometimes
23 maybe the uncertainty of our data is very high, then
24 we should refer to the director and ask for other
25 margin.

1 MS. CZOSKI: Okay. Thank you. I don't
2 have any other questions.

3 THE HEARING OFFICER: All right. Thank
4 you. Commissioner Ampomah?

5 DR. AMPOMAH: Can we take about a five-
6 minutes break?

7 Oh, yes. Yes, absolutely.

8 DR. AMPOMAH: Thank you.

9 THE HEARING OFFICER: Let's take ten
10 minutes and come back at 10:20.

11 (Off the record.)

12 THE HEARING OFFICER: Thank you,
13 Sheila. Let's come back from the break, please.

14 Commissioner Ampomah, do you have
15 questions for Dr. Wang or Dr. Khaniani?

16 DR. AMPOMAH: Yes, I do.

17 CROSS-EXAMINATION

18 BY DR. AMPOMAH:

19 DR. AMPOMAH: Thank you, Dr. Wang and
20 Dr. Khaniani for coming in to testify on this
21 important rulemaking.

22 Now, I just want to clarify that all
23 questions with regards to the rule, you prefer I defer
24 that to the second panel, or I can ask you questions
25 about the rule itself?

1 DR. KHANIANI: Yes.

2 DR. AMPOMAH: Which one is it?

3 DR. WANG: We prefer to defer that one
4 to the rules group, yeah.

5 DR. AMPOMAH: Okay. And also -- so
6 then your role is more or less doing technical work to
7 support the rule?

8 DR. WANG: That's correct.

9 DR. AMPOMAH: Okay.

10 DR. WANG: Yes.

11 DR. AMPOMAH: Okay. Good.

12 And also, Dr. Khaniani, so you are
13 testifying specifically on forward fractures, induced
14 seismicity geomechanics, forward pressure limits,
15 reservoir simulation, uncertainty, pressure front
16 behavior. Is that correct?

17 DR. KHANIANI: Correct.

18 DR. AMPOMAH: Okay. So Dr. Wang, you
19 are -- I just want to make sure I know who I'm asking
20 my questions to. So Dr. Wang, you are talking about
21 well logs, formation testing, MIT, plugging materials,
22 plugging verification, and well closure?

23 DR. WANG: All the items under the
24 logging, sampling, and testing prior to the injection
25 operation and injection well plugging.

1 DR. AMPOMAH: And also you feel
2 comfortable probably that I don't go into the Class II
3 with you. Is that fair?

4 DR. WANG: That's kind of out of my
5 scope. Yes.

6 DR. AMPOMAH: Okay. So let me -- let
7 me start with Dr. Khaniani. You know, we've discussed
8 a lot about the model uncertainties. Now, let me ask
9 you, must model include sensitivity and uncertainty
10 analysis? And if so, what parameters must be varied?

11 DR. KHANIANI: So there are many
12 parameters. Some of the parameters are related to the
13 model itself. The parameter related to the
14 production, like diffusivity, related to the
15 diffusivity, and also the production. So I don't know
16 if I answered your question.

17 DR. AMPOMAH: I'm listening. Okay. So
18 based on all the discussions, and even the cross, you
19 believe that there are a lot of uncertainties that at
20 least your operator has to consider. Is that fair?

21 DR. KHANIANI: There are some
22 uncertainty for our measurement. For example, the
23 logging, if you want to estimate porosity and
24 permeability, you have some uncertainty measure -- in
25 terms of measurement and also in terms of

1 interpolation into the reservoir.

2 So that's -- yeah, there are some
3 uncertainty for the measurement. And it's not about
4 this. I mean, you -- you have this uncertainty in
5 other field of engineering as well, not only in the
6 reservoir.

7 DR. AMPOMAH: So if you look at a
8 normal Class VI application, would you agree with me
9 that there is a component that an operator has to
10 perform uncertainty analysis, especially to the model?

11 DR. KHANIANI: Yes.

12 DR. AMPOMAH: Okay. Now, would you
13 also agree with me that since there are numerous
14 number of uncertainties that could be more or less
15 taken under a particular site specific situation,
16 there should be a way where there has to be a prior
17 discussion with the director to more or less decide
18 what type of uncertainties that needs to be modeled as
19 part of the AOR application. Would you agree with
20 that?

21 DR. KHANIANI: Yes.

22 DR. AMPOMAH: Okay. And if that is not
23 in the rule, do you believe that we should consider
24 incorporating that into the rule?

25 DR. KHANIANI: Regarding the -- the

1 problem, regarding the rules I defer to the lawyers or
2 other -- maybe Matt, Greg, they can answer this
3 question about the ruling.

4 DR. AMPOMAH: But at least -- but at
5 least you agree with me that it is an important
6 component that at least the second panel needs to
7 address?

8 DR. KHANIANI: Yes. I -- I agree.
9 Yeah, I -- I agree that -- because it's very important
10 to discuss the uncertainty.

11 DR. AMPOMAH: Okay. Now, still on
12 that, must an applicant quantify probabilistic ranges
13 for plume and pressure from extent? Or is a single
14 deterministic type of modeling?

15 DR. KHANIANI: Can you repeat that
16 again?

17 DR. AMPOMAH: Okay. So I'm asking you,
18 must the applicant quantify that probabilistic ranges
19 of plume, that would be the CO2 plume; right? And
20 then also the pressure from the extent. Or you
21 just -- or let's say or you subscribe to the fact that
22 it just has to be a single deterministic type of
23 modeling?

24 DR. KHANIANI: No. I agree with you.
25 This would be probabilistic. And I think that is part

1 of the -- like a standard method that --

2 DR. AMPOMAH: You believe that is the
3 standard method?

4 DR. KHANIANI: If you can -- people do
5 sensitivity analysis in the reservoir, and they do
6 plus/minus of the parameter. And at the end, they
7 provide -- actually, the outcome of the simulation is
8 probabilistic at the end.

9 DR. AMPOMAH: Have you reviewed -- and
10 Sai can jump in and help you if he would, have you
11 reviewed a typical UIC Class VI permit before that
12 you've seen that operators are more or less doing
13 probabilistic assessment for CO2 plume and then for --
14 for pressure front?

15 DR. KHANIANI: I have participated in
16 different MRV plans. And based on that, I -- I saw
17 some reports, but it was related to Class II --

18 DR. AMPOMAH: Okay. The second point
19 definitely will help here. Thank you. Now, so we've
20 been discussing about the models, and you talked about
21 the uncertainties. We doing the history matching.
22 We're trying to make our model more realistic. But
23 how is OCD going to determine if this model is over-
24 fitted? But let's say if it's a over-fitted model
25 from your point of view?

1 DR. KHANIANI: In my view, we need to
2 make sure that we follow all of the procedure in terms
3 of gaining the data from modeling. How accurate is
4 the modeling? And also we do -- it's a validation of
5 the model based on the available data that we have.
6 But that will be initial step.

7 But after production, we have more data
8 that we include in the reservoir to improve the model.
9 But -- so basically, we do the simulation of the
10 model. We want to make sure that the procedure is
11 accurate.

12 DR. AMPOMAH: So based on your
13 response, clearly you are saying that prior to --
14 let's say during the permit to inject -- the permit to
15 construct, there's not a -- a lot of information. So
16 definitely the model might not necessarily 100 percent
17 be reliable. But once we have enough data, we have to
18 calibrate. And that calibration more or less reduces
19 the uncertainty. Are we on the same page?

20 DR. KHANIANI: So I agree that -- about
21 the uncertainty, but I don't know if the model is
22 unreliable because we are using the physics behind the
23 diffusion equation. And also we are combining that
24 with other available data based on the physics.

25 But I don't think the terminology of

1 unreliable -- I -- I do not agree, but -- but
2 uncertainty, I agree with you. There are uncertainty
3 about the -- the model creation. And the way that we
4 sense the underground model with the 3D seismic, the
5 quality of the seismic, there are uncertainty
6 involved, so.

7 DR. AMPOMAH: Yeah. So I was getting
8 at -- if I use unreliable, strike that. Okay. But
9 what -- where I was getting at is that the initial
10 models do have a higher uncertainty. And you said
11 that once we start injecting, we are having pressure
12 data, injection data, so we can calibrate this model
13 to even reduce the uncertainty?

14 DR. KHANIANI: Correct.

15 DR. AMPOMAH: Okay. Now on that one,
16 what objective measure from your experience of model
17 to fit filled mismatch will trigger recalibration or
18 AoR reevaluation?

19 DR. KHANIANI: I would like to refer
20 this to Sai maybe, if you want to elaborate more on
21 this.

22 DR. WANG: Could you please repeat your
23 question?

24 DR. AMPOMAH: So we just discussed
25 about the different type of models where initial

1 model's high uncertainty. As we are getting more
2 data, less uncertainty. So I'm asking you OCD do have
3 the initial model and then a subsequent model. So I'm
4 asking what should be the measure, okay, the objective
5 measure. Okay? Objective measure of model to fit
6 mismatch that will trigger a recalibration, or let's
7 say reevaluation, of the AoR?

8 DR. WANG: I don't think I can cover
9 this question for you regarding to the modeling
10 parameters.

11 DR. AMPOMAH: You can't.

12 DR. WANG: Yeah.

13 DR. AMPOMAH: I will put next panel
14 here. Okay.

15 Now, so the question probably is still
16 for Dr. Khaniani. Talking still about the uncertainty
17 analysis here. Do you believe that an operator should
18 establish their own project-specific mismatch, or they
19 can just put in the application and wait for the
20 director to step in?

21 DR. KHANIANI: You mean if any
22 operator, they should have their own standard instead
23 of the director supervision?

24 DR. AMPOMAH: So assuming, let's say,
25 an operator will say that in our business, normally

1 when you do history matching, you want to be less than
2 10 percent; right? So this is a standard rule -- rule
3 of thumb. Okay. That is a standard.

4 So at the time where, let's say, an
5 operator is submitting the reevaluation of the AoR,
6 based on the history matching and all of that, do you
7 believe that the operator should establish the
8 mismatched conditions, or they don't need to, they
9 just have to wait for the director to give those
10 conditions?

11 DR. KHANIANI: I think this is -- I can
12 refer this to the other panel. It's about their
13 ruling.

14 DR. AMPOMAH: Yeah. But I thought
15 you -- you are testifying on simulation modeling?

16 DR. KHANIANI: Yeah. But I mean, you
17 say if the -- the operator should make their analysis
18 and -- or they should wait for operator to tell them
19 what analysis they should do. And this is regarding
20 to the ruling.

21 DR. AMPOMAH: So I'm curious though,
22 based on the cross, you said that -- or even based on
23 your testimony, you're talking about the fact that all
24 the information on the modeling will be made available
25 to the general public so that the public can evaluate

1 and see what is there.

2 DR. KHANIANI: So I -- my discussion
3 was not -- I mean, about the public comments or
4 available information. My comment is that if you are
5 going to include the third-party evaluation, we have
6 uncertainty regarding the third party itself. And
7 there can be dispute about the standard that a third
8 party can make about regulations, about the -- the
9 standard that they have, and the assumption that any
10 third party can have. And also there will be
11 discussion about the third party's certification. So
12 lots of things that any third party can have different
13 criteria with -- I mean, the other third party.

14 So my -- my ruling was that we should
15 not mandate employing a third-party verification in
16 order to do the permit. Instead, we should rely
17 because the permit process require discussion with
18 OCD. Or even they -- they will review it. And then
19 there are lots of public information that will be --
20 transparently will be available to the public.

21 So any third party, if they are
22 interested, they can use this information to perform
23 the evaluation. Of course, they cannot do all of the
24 evaluation that an operator are doing, but they can --
25 if they are interested, they can study any permit

1 process.

2 So my -- my ruling was that we cannot
3 just have, like, a -- a standard universal requirement
4 and mandate that a third party is required to evaluate
5 that because OCD, they will already review this
6 process.

7 DR. AMPOMAH: Now that you brought that
8 up, let's pick that one up. Now, you're saying that
9 OCD and EPA already conduct technical review -- permit
10 technical review. Now, let me ask you, are you
11 familiar with how EPA reviews its Class VI permit?

12 DR. KHANIANI: Regarding the New Mexico
13 here?

14 DR. AMPOMAH: No. General how EPA --
15 let's say EPA region six. Are you familiar with how
16 they review Class VI permits?

17 DR. KHANIANI: No, I am not.

18 DR. AMPOMAH: So then why do you say
19 that -- let me strike that. So you went on to say,
20 public notice and comment already allow outside
21 technical review.

22 So when you backtrack on your response
23 that you are not saying that the data is going to be
24 available in the -- in the -- to the public to make
25 their own determination, how do you square that with

1 that statement though?

2 DR. KHANIANI: So -- so we are in
3 the -- having the process of the -- like a -- I mean,
4 OCD permit process. And in that one, we put a lot of
5 information in the report that will be available for
6 the public. So that was the comment I made for the
7 information that we give and then present it, it will
8 be in the public domain.

9 DR. AMPOMAH: Now, since you said you
10 are not familiar with how EPA does its permit, that
11 will be the next panel. Or probably Sai can chime in
12 if he -- if he need -- if he has any input on that.

13 EPA does use technical experts, which
14 are third parties. Even EPA has used National Labs to
15 perform reviews. So we are saying that the rules --
16 you are saying that the rules that you are putting
17 across here is even stricter than that of EPA. So I
18 want to understand how you feel like a third-party
19 review should not necessarily be mandated?

20 DR. KHANIANI: So third party, as you
21 mentioned, maybe -- and they mandated by the EPA;
22 right? But I cannot comment on that.

23 DR. WANG: Commissioner Ampomah, can
24 I -- I deliver more on the review process?

25 DR. AMPOMAH: Sure.

1 DR. WANG: So there's a confusion for
2 me for the third party. You mentioned that EPA
3 assigns the review task to National Labs, the third
4 party. That's the case because EPA region six didn't
5 have enough employees to review this process. They
6 had to assign or release those kind of review process
7 or components to a third party.

8 So I get confusion from here. Is that
9 necessary to put a third party right here for review
10 if OCD have enough personnel, or EPA have enough
11 personnel to review? That's my confusion portion.
12 Yeah.

13 DR. AMPOMAH: Okay. So from your
14 experience, do you believe that -- and this one, I was
15 waiting for the next panel, but since you brought it
16 up, do you believe that, let's say, UIC Class VI
17 group, and Mr. Wrinkle talked about it, that they have
18 three staffs, permanent staffs. Do you believe that
19 that is enough to review a UIC Class VI permit? That
20 question was not for you, but you brought it up, so.

21 DR. WANG: I don't know of this.

22 DR. AMPOMAH: Okay.

23 DR. WANG: Yeah.

24 DR. AMPOMAH: Now, since you brought
25 this up, now, don't you believe that OCD more or less

1 also have to use the state resources that is
2 available? Now you do have -- and you don't
3 necessarily have to respond to this, the next panel,
4 but since you brought it up, I just want a complete
5 the transcript.

6 You do have the Bureau of Geology in
7 the state. You do have Petroleum Recovery Research
8 Center in the state, or do have tremendous experience
9 in those area? So don't you believe that the state
10 should rely on the expertise in the reviews of these
11 applications?

12 DR. WANG: I would defer this question
13 to the next panel.

14 DR. AMPOMAH: Okay. So just to
15 complete my -- just to complete a statement. Okay.

16 Dr. Khaniani, let's come back to you.
17 With regards to the -- the seismic issue that we're
18 discussing, I mean, it sounds to me that you are pro-
19 seismic. You really want to see seismic. You really
20 want to see seismic happening. But you don't want it
21 to be mandated. Is that your position?

22 DR. KHANIANI: I cannot comment on
23 that.

24 DR. AMPOMAH: But I mean, you -- you
25 are presenting to us about all the importance of site

1 characterization. I

2 DR. KHANIANI: I will say my personal
3 view?

4 DR. AMPOMAH: Yes.

5 DR. KHANIANI: My personal view is that
6 seismic is very important. Not only about finding
7 fault, but also finding the structure of subsurface in
8 order to reduce the uncertainty that we just mentioned
9 about porosity, permeability. We can extend that
10 based on the properties that we have.

11 So in my view, permit, they -- any --
12 any analysis of drilling, we need to have, like,
13 information from the subsurface. There are not only
14 the 3D seismic and there are other type of seismic
15 data that they can have. For example, VSP, they are
16 like a cross seismic. So anything that helps to
17 identify, like, a subsurface structure, their
18 properties and the fault system, I think I advocate
19 that.

20 DR. AMPOMAH: And even on top of that,
21 tell the Commission how an operator is going to be
22 able to establish a plume front in 3D without a
23 baseline seismic data and a 40 seismic data? You're
24 going to your attorney?

25 DR. KHANIANI: I think I will refer to

1 my attorney.

2 DR. AMPOMAH: You'll refer to your
3 attorney?

4 MR. TREMAINE: Commissioner, I think
5 you said "40." I didn't understand the question.

6 DR. AMPOMAH: He does.

7 DR. KHANIANI: Forty means you repeat
8 the seismic during the time, and you want to see the
9 plume migration during the time, so.

10 BY DR. AMPOMAH:

11 DR. AMPOMAH: Let me back -- let me --
12 let me rephrase my question because we are still on
13 the importance of the 3D sizing data; right?

14 So we're talking about models, models,
15 uncertainties, uncertainties.

16 DR. KHANIANI: Yes.

17 DR. AMPOMAH: And you're a physicist.

18 DR. KHANIANI: Yes.

19 DR. AMPOMAH: The 3D seismic can also
20 help you to really see the plume. Is that correct or
21 not?

22 DR. KHANIANI: I agree. Definitely.

23 DR. AMPOMAH: So if you want to see,
24 I'm not sure of physical evidence of the plume, why
25 should 3D seismic not be mandated?

1 DR. KHANIANI: I'm not sure whether
2 they're mandating 3D seismic, because I think maybe
3 the other panels can respond to that. But I think it
4 will be very helpful tool to identify the plume and to
5 see how the extent if they reach the fault.

6 So it gives us lots of information, but
7 mandating a 3D seismic, first of all, maybe there are
8 other factors that we can use. For example, if you
9 have a fault, you can do other well testing to see
10 the -- the fault hitting the system or not. I mean,
11 we can see the boundary. There are other evaluation.

12 But for me, I cannot comment on
13 mandating the 3D seismic. I refer this to people that
14 are -- I don't know about rules.

15 MR. TREMAINE: Commissioner Ampomah, if
16 I may. I think the distinction here is that
17 Dr. Khaniani is trying to describe the technical basis
18 and how the modeling would work in response to your
19 questions. But he's certainly, I think, and
20 appropriately apprehensive of providing, like, the
21 policy decision recommendation of the OCD; right?

22 So I think we will have witnesses that
23 can talk about this. And it's something that if
24 there's a proposal to include 3D seismic as a
25 requirement in -- because as I sit here today, I don't

1 recall that being a comment or proposed edit that was
2 that was rejected. I may have that wrong. But that's
3 something that we can consider and always take a
4 position on in closing.

5 So that's the distinction here. I just
6 want to represent that we want to answer your
7 questions, but I think the decision of whether to
8 include something in the rule was not something that
9 we asked either of these witnesses to testify to.

10 DR. AMPOMAH: Thank you. And I'm
11 building my questions for the next panel actually. So
12 because I want to hear what the technical expert is
13 saying. And then I want to hear how the team members
14 that really worked on the rule is also saying based on
15 what a technical witness is saying.

16 BY DR. AMPOMAH:

17 DR. AMPOMAH: Dr. Khaniani, let me --
18 still on the seismic. Now, the two major basins in
19 the state of New Mexico. You have San Juan basin.
20 You do have the Permian basin. You've done a lot of
21 work probably in these two basins.

22 Do you believe that an operator has to
23 do all they can to see if 3D seismic data exists and
24 use it as part of the application?

25 DR. KHANIANI: My answer is yes.

1 DR. AMPOMAH: Okay. And you see, so if
2 we are to discuss more about why 3D seismic more or
3 less cannot necessarily be mandated, it's about --
4 let's say, if you are going to shoot 3D seismic with
5 multiple -- multiple land owners, you have Navajo
6 Nation, you have State Land's Office, you have
7 private. Those could be very challenging; right? So.

8 DR. KHANIANI: Correct.

9 DR. AMPOMAH: And also even if you look
10 at our two basins, I mean, a lot of work has been done
11 there; right? So -- but I just wanted to probe that
12 and still more or less put on record how important the
13 3D seismic is.

14 DR. KHANIANI: Yes. As we --
15 Dr. Ampomah mentioned, I want to confirm that New
16 Mexico has a challenging geology, most of the region,
17 based on my experience from the north of New Mexico to
18 the south. All of them, we had a challenging geology,
19 a lot of fault exists. Usually fault exists. And --
20 but we cannot just generalize that based on the
21 experience that I had.

22 We had fault. Yes, I agree. We have
23 to emphasize on the presence of seismic data. And it
24 is very important from the -- from the perspective of
25 modeling and also the faults.

1 So -- but I cannot generalize that for
2 any region. But I had some experience and we saw that
3 there were fault and even uplifting different region.
4 We experienced that and also there was lots of faults.
5 I -- I confirm. I agree with you in the technical
6 aspect that seismic plays very important role.

7 DR. AMPOMAH: So Dr. Khaniani, you
8 discuss about presence of faults. Now, can you tell
9 the Commission how applicants are going to be able to
10 describe the fault as either being ceiling or, let's
11 say, closed?

12 DR. KHANIANI: Yeah. So when we have
13 fault, it can be ceiling, it can be transmissive. So
14 it depends on each fault. So we cannot automatically
15 exclude the fault as, like, a transmissive or we
16 cannot make a conclusion, a type of fault. But what
17 we can do is rely on different, like, analysis and
18 different assumption to reduce the risk.

19 So the fault is transmissive. If it
20 can carry the fluid from the injection zone to the
21 other unwanted zone. And it can be also ceiling
22 because of the property that we have on the fault.
23 For example, it -- it depends on the stress of the
24 region, or how the separating layers lay on each
25 other. Okay?

1 So it depends on the geological
2 formation, the stress regime, and your injection. So
3 it's a very careful consideration, but I would say
4 about the caring about the fault system.

5 DR. AMPOMAH: And even it can still be
6 onsetting when an operator can say that, okay, these
7 falls are open, but it could probably end up that it's
8 closed?

9 DR. KHANIANI: Correct.

10 DR. AMPOMAH: So do you believe that if
11 there is any suspected presence of faults in an area,
12 the operator has to include that as part of the
13 uncertainty analysis in the application?

14 DR. KHANIANI: Correct. They should
15 perform uncertainty on the fault and do different
16 evaluation based on different scenario. And they
17 should assume that this is ceiling, or they should
18 assume that this is open. And then if that is open,
19 where are the contaminant fluid will go? If it's
20 closed, how much pressure increase or other factor
21 affect the simulation? I agree.

22 DR. AMPOMAH: Now, in the AoR, or let's
23 say even in a -- in the UIC Class VI application,
24 usually operators are required to do the original
25 seismicity analysis; right? So my question to you is

1 that how far beyond a model AoR should original
2 seismicity and forces them to be evaluated?

3 DR. KHANIANI: Oh, okay. So the -- for
4 the seismicity, we have the mandate from the New
5 Mexico microseismicity data. I don't have that number
6 for now, but I can refer you later. But it has about
7 magnitude of the Permian. And if that happens during
8 the production, you have -- you have to consider
9 certain miles.

10 I think it will be 3, 6 miles or 10
11 miles. I cannot remember right now, but I can give
12 you later. But it's about occurrence. For example,
13 if you have a 2.5 within a month, then you have to
14 perform reporting. So that is already mandated.

15 DR. AMPOMAH: Okay.

16 DR. KHANIANI: And there are some --
17 some scenario that you have bigger than magnitude 3
18 during production. Then you have to restrict drilling
19 in some certain area. So that already have been
20 documented.

21 And it also depends on the
22 microseismicity or -- that we receive where the source
23 is and what is the nature of that? So we have to
24 evaluate that one as well.

25 DR. AMPOMAH: So -- so are you

1 referring to the -- the specific traffic light
2 protocols?

3 DR. KHANIANI: No. New Mexico
4 microseismicity protocols.

5 DR. AMPOMAH: Well, that's probably the
6 same. Okay. But -- so then let me ask that do you
7 believe that operators, more or less, as part of the
8 application, has to more or less establish that in
9 consultation, let's say, with the -- with what you
10 just described as the state microseismic protocols.

11 DR. KHANIANI: Yes.

12 DR. AMPOMAH: Okay. But not
13 necessarily mandated for every project; right?

14 DR. KHANIANI: I -- I am not sure about
15 that.

16 DR. AMPOMAH: Yeah. Because if -- we
17 do know the state, we do know our basins. We do know
18 basins where microseismicity is a big deal; right?
19 Let's say if you're talking about the Permian compared
20 to, let's say, the San Juan. So areas where there's
21 no microseismic prone area, then not necessarily
22 mandating people to be really focusing on these?

23 DR. KHANIANI: Correct.

24 DR. AMPOMAH: Okay. Now let me ask, so
25 what baseline period -- you know, what baseline period

1 is necessary, okay, to distinguish natural seismicity
2 from induced seismicity events?

3 DR. KHANIANI: That requires analysis.
4 I cannot answer that as of now.

5 DR. AMPOMAH: And then you said that
6 they are already threshold.

7 DR. KHANIANI: Yes.

8 DR. AMPOMAH: Already established in
9 the state.

10 DR. KHANIANI: Yes.

11 DR. AMPOMAH: So when an operator is
12 operating and more or less there is a microseismic
13 events, triggers, then there's protocols as to what
14 you will follow?

15 DR. KHANIANI: Correct. And
16 microseismicity that we are reported during the well,
17 they already have location or orientation there are
18 different types of -- like a frequency. But the
19 natural occurring usually have lower frequency.
20 That's what I can comment on that.

21 DR. AMPOMAH: Now -- and if you are not
22 comfortable responding to this, you can defer. But
23 based on your experience in this field, let's say
24 there's a microseismic event that happened. Okay?
25 What -- what are the criteria for restarting injection

1 after, let's say, a microseismic event, based on your
2 experience? Yeah.

3 DR. KHANIANI: I would say -- let's say
4 a microseismic event happens and we recorded and we
5 are suspected that there is a fracture in my -- and --
6 and we created the fracture to the confinement zone or
7 other ceiling zone, then we need to do the corrective
8 action plan and make sure that this is related to the
9 fracture.

10 We have to do secondary analysis to
11 evaluate what is the source of that microseismic. And
12 if the fracture happened, then we need to evaluate our
13 data and make a simulation if that does happen for the
14 new fracture.

15 DR. AMPOMAH: So then is it your
16 testimony that a revised geomechanical model will be
17 required, you know, once there's a microseismic event,
18 prior to, let's say, the director giving the
19 permission to continue the injection? Is that your
20 testimony?

21 DR. KHANIANI: I didn't discuss about
22 mandating.

23 DR. AMPOMAH: No mandating. No
24 mandating. We are just talking about when should
25 injection resume; right? And, you know, as part of

1 this rulemaking, we also have to make sure that we are
2 establishing the safeguards for the public to have
3 confidence in the rule that we are more or less
4 working through now. So I'm asking you. You talked
5 about if there is a microseismic event. There has to
6 be an investigation. And even to the point where
7 stress models needs to be updated.

8 DR. KHANIANI: Yes.

9 DR. AMPOMAH: So I'm not saying you,
10 should that be done as a condition for the director to
11 give the go-ahead to risk that injection?

12 DR. KHANIANI: I think -- I think so.

13 DR. AMPOMAH: Now, let's talk about
14 cumulative. Let's say Company A, Company B, they are
15 all operating. And all of a sudden there is a
16 microseismic event that happens. As a technical
17 expert advising OCD, okay, in a UIC Class VI program,
18 what happens?

19 DR. KHANIANI: So you -- you identify
20 the location. And if that location related to the --
21 and then also you are doing your geomechanical
22 analysis, and if that is related to your operation,
23 you have to take action, correct the action. And
24 the -- I mean, go with your -- like as you mentioned,
25 with your secondary analysis.

1 And if that is related to the fracture
2 or it was just a microseismic event, maybe it's not
3 related to creation of the new fracture system. So we
4 have to evaluate that and see if that is related to
5 this well, Class VI well or other. If -- if I
6 understand your question.

7 DR. AMPOMAH: No, that is good. But I
8 was more or less looking for, or wanted to discuss
9 about, let's say company A or company B. Now, the
10 analysis needs to be done in terms of you located
11 right here, this is the location of the event. Now,
12 there's another one operating here.

13 I'm asking, should there be, let's say,
14 any radius with regards to operations where a
15 microseismic event happens, there has to be a boundary
16 of investigation. That is where I'm getting to.

17 DR. KHANIANI: Yes. We are evaluating
18 the AoR. I think if that is within your AoR zone,
19 that create a microseismic zone because you create --
20 you induce the fracture or you induce the
21 microseismicity event due to the increase in the
22 pressure. So I would suggest to look at the AoR
23 region that you have already predicted.

24 DR. AMPOMAH: So you discussed a
25 numerous number of pressures. Now -- and let me look

1 at my notes here. You talked about the formation
2 fracture pressure. You talk about fault reactivation
3 threshold. You talk about confining zone integrity.

4 DR. KHANIANI: Yeah.

5 DR. AMPOMAH: Now, based on the -- the
6 discussion with my co-commissioner, you said 90
7 percent of the fracture pressure is more or less what
8 is in the regulation. But you've also discussed all
9 these other pressures.

10 So should the director consider all
11 these other pressures before setting up, and not
12 necessarily saying 90 percent, what the fracture
13 pressure should be, or -- pressure should be?

14 DR. KHANIANI: I agree. The -- the
15 operator should have -- I mean, this conversation and
16 based on the data that you have, they make the
17 decision if you want to use 10, 90 percent or 80
18 percent or 70 percent based on the region that you
19 have. So the -- I -- I mean, the -- not operator, the
20 director should have this authority. So based on the
21 information that the operator, they give them.

22 DR. AMPOMAH: So are you saying that
23 it's not 100 percent automatic that even though the
24 rule is saying or EPA suggested 90 percent, the
25 director has to consider all the other three pressures

1 before coming up with that number?

2 DR. KHANIANI: Correct.

3 DR. AMPOMAH: Okay. And not
4 necessarily 80 percent?

5 DR. KHANIANI: Correct.

6 DR. AMPOMAH: Okay. Now -- so if I go
7 to slide number 17, that is a rebuttal where you're
8 talking about -- I think the -- there was a question
9 about your -- the models being unreliable. And even
10 you went back and forth with me on that.

11 Now, you were saying that Class VI
12 models are built on site-specific data, and you list
13 them. So let me ask you. Are you mandating a strut
14 well in locations where there is no data in the
15 injection zone or the -- or let's say the storage
16 complex?

17 DR. KHANIANI: I cannot answer because
18 if there is no data, then you have a lot of
19 uncertainty; right? So.

20 DR. AMPOMAH: Let me rephrase my
21 question. So you are saying that you are challenging
22 that models are -- we cannot term models as
23 unreliable; right?

24 DR. KHANIANI: Correct.

25 DR. AMPOMAH: Because you are saying

1 that Class VI models are built -- and I'm reading from
2 your slide 17, this will be a rebuttal. So you're
3 saying that Class VI models are built from site-
4 specific data.

5 And I'm asking you, in instances where
6 there has not been any penetration -- or let's say
7 there are penetrations, but this information that
8 you've listed here is not available. Are you
9 suggesting that an operator has to have a strut well
10 to have all this information before they can put up a
11 UIC Class VI application?

12 DR. KHANIANI: I would refer that to
13 the other panel on this.

14 DR. AMPOMAH: If you don't feel
15 comfortable responding to that, then I'm not sure the
16 unreliable term that is being used to categorize some
17 type of models, I don't think you can dispute that.

18 DR. KHANIANI: I dispute about
19 unreliability of the -- the reservoir simulation and
20 those modeling. They are based on the physics. We
21 have uncertainty on the input information, but they
22 will -- we get -- once we get, like, a more accurate,
23 they are not unreliable. That's what I -- I refer to.
24 But --

25 DR. AMPOMAH: Okay. I'll let you off

1 the hook now. Let me go to Dr. Wang.

2 And let me go to your presentation
3 here. So Dr. Wang, I'm looking at your presentation,
4 and I'm looking at slide number four, where you list
5 all the logs that are mandated pre-drilling.

6 DR. WANG: Yes, Commissioner.

7 DR. AMPOMAH: Yeah. Yeah. That is
8 a -- the permit to construct. So do you believe that
9 these logs that -- based on the rule we are mandating.
10 Okay? Do you believe that these logs can establish a
11 reliable pre-injection baseline against, let's say,
12 any issues that could happen in the future?

13 DR. WANG: Yes, I do.

14 DR. AMPOMAH: Now, are these logs, any
15 of them, capable of detecting microannuli flow or
16 degradation behind multiple casing strings?

17 DR. WANG: To my understanding -- could
18 you please repeat your question again? Sorry. I need
19 to be very clear.

20 DR. AMPOMAH: Yeah, sure. You know, I
21 started my question asking about -- do you believe
22 that these logs that in the rule that we are mandating
23 sets a baseline for us? You said yes.

24 DR. WANG: Yes.

25 DR. AMPOMAH: So I'm asking you --

1 because definitely with regards to, let's say, time
2 lapse, we look at the baseline and then the -- the
3 time lapse to look at the differences and say, okay,
4 there's something going on there. Let's go check it
5 out; right? So I'm asking you, do you believe that
6 these logs that we have are capable of detecting
7 microannuli flow, meaning outside the flow, in the
8 annulus. Okay? Or degradation behind multiple casing
9 strings?

10 DR. WANG: For the multiple casing
11 strings, there's a little -- technically, there is a
12 little bit of challenge to detect these kind of micro
13 channels for over three casing layers. But under this
14 proposed rules, we have the surface casing set up,
15 placed, and then do the CBL/VDL.

16 And then for the production long-string
17 casing, we also have the single layer for the CBL/VDL.
18 I think they should be able to provide a baseline data
19 for comparison -- compare -- comparison with the
20 future injection. Yes.

21 DR. AMPOMAH: Now, let me ask you with
22 your experience in UIC Class VI standard applications,
23 and I don't know whether you've done some reviews here
24 and there, does companies go beyond these logs or just
25 restricted to these logs?

1 DR. WANG: Based on my experience, some
2 operators may go beyond, but at least they meet the
3 minimum requirements and have this baseline data. And
4 have a -- a good interpretation with the data site
5 is -- should be certified for this permit. Yeah.

6 DR. AMPOMAH: So even though the rule
7 is mandating these, but operators normally would have
8 to evaluate their situation and then come up with a
9 logging plan to help them in the long term?

10 DR. WANG: Technically, yes.

11 DR. AMPOMAH: Okay. Now, you talked
12 about falloff test. Is that correct? The pressure
13 test?

14 DR. WANG: Yes, I did.

15 DR. AMPOMAH: Okay. Now, how will the
16 falloff test be used to estimate the transmissibility,
17 the scan boundaries, and then the pressure
18 communications?

19 DR. WANG: So the falloff test, the
20 procedure is generally you pump or inject the fluid in
21 the -- at a constant rate. And then you shutting the
22 valve. Then you recall the bottom pressure and then
23 gather the interpretation for the reasonable
24 conditions. Yeah.

25 So that's the procedure to get the data

1 from the test. And then from the bottom-hole
2 pressure, you can analyze the reservoir pressure
3 decline curves. And from there, you can analyze the
4 scan factor and some other factors that you mentioned.
5 Yeah.

6 DR. AMPOMAH: Now -- so based on the
7 rule that you're proposing, or OCD is proposing,
8 interference test is not a requirement; right?

9 DR. WANG: When you mention
10 interference test, could you please -- these terms?

11 DR. AMPOMAH: Okay. So let's say at
12 what point should interference between two wells be a
13 factor here for OCD to -- or let's say for the
14 director to recommend -- or no, for the director to
15 ask for interference test?

16 DR. WANG: That one -- I will defer
17 this one to the next section. Yeah.

18 DR. AMPOMAH: Okay. Okay. Now, must
19 the test design for the pressure falloff test, must
20 this one -- must the test design and interpretation be
21 independently reviewed by OCD before the results are
22 accepted?

23 DR. WANG: Technically, yes. But for
24 the rulemaking, I will defer that one to my next
25 section. Yeah.

1 DR. AMPOMAH: But it's your testimony
2 that at least another person has to look at it before
3 it is accepted.

4 DR. WANG: Yes. Yes. As I said.

5 DR. AMPOMAH: Okay. Let me ask you
6 these questions. I mean, probably Mr. Eales can
7 respond to that as well, but -- so if you -- if you
8 don't feel comfortable, you just pass it on.

9 DR. WANG: Sure.

10 DR. AMPOMAH: Now, what plugging
11 standard applies to a legacy well exposed to, let's
12 say, a carbonic -- the potential carbonic acid, and
13 let's say they sustain elevated pressure?

14 DR. WANG: Is this portion related to
15 the non-injection well or some other well taps?

16 DR. AMPOMAH: Yeah. So these ones are
17 legacy abandoned wells.

18 DR. WANG: So that one -- I will defer
19 that one to Matt Eales, who is working on the testing
20 monitoring plan. Yeah.

21 DR. AMPOMAH: Okay. Then I'm going to
22 leave all remaining ones for Matt. For Mr. Eales.
23 Okay.

24 Now, you talked about cement. Now, how
25 will cement compatibility with CO2 rich fluids be

1 demonstrated for the expected duration of risk?

2 DR. WANG: If I understand your
3 question correct, you are asking how this cement can
4 be compatible to the CO2 rich fluid; right? So the
5 service provider and all -- and other technical papers
6 or lab tests already performed for this specific
7 formula where we have the resistant components added
8 to the cement.

9 For example, the Class C, a cement
10 type. Okay. So all those kind of cement already have
11 a -- with the fluid from the service vendor. That
12 information should be provided to the applicants, to
13 the operator, for further evaluation on this product.
14 Yeah.

15 DR. AMPOMAH: So there was a discussion
16 either from my co-counsel, from other parties. You
17 know, so they were talking about the -- the corrosion
18 resistant cement. Now, help the Commission to
19 understand how a company chooses a cement or a gives
20 its strength?

21 DR. WANG: So the company -- the
22 service company develops this formula by their -- you
23 know, their -- their own techniques. And they apply
24 this kind of cement already in the CO2 environment.
25 Like, let's say the CO2 UR well. And for example, in

1 New Mexico, the Class II for the acid gas injection
2 well. So there is approved evidence to show this kind
3 of cement compatible to the CO2 enriched environment.

4 Yeah. That is going to be a desired
5 document technically should be request from the
6 service company. Yeah.

7 DR. AMPOMAH: Now, is it typical that,
8 let's say company A, who wants to decide on the type
9 of cement that they want to use? More or less give
10 DSI specific information to the service company to
11 verify, to recommend what type of casing strings, or
12 let's say what type of cement, based on their own
13 analysis could be useful. Is that correct?

14 DR. WANG: Could you please repeat?

15 DR. AMPOMAH: So I'm asking you, is it
16 typical industry practice where operators will provide
17 site-specific information, like salinity, like, let's
18 say -- yeah, the -- the composition of the brine to a
19 service company as part of their review in choosing
20 the cement and then also even the casing strings?

21 DR. WANG: Technically, yes.

22 DR. AMPOMAH: Dr. Wang, so how do
23 impurities and formation fluids affect the long-term
24 performance of plugging cement, and let's say any
25 other well barriers?

1 DR. WANG: So after the series of
2 injection, they still have the CO2 fluid inside the
3 wellbore and the near wellbore, and those kind of
4 fluid are going to -- when you do the plugging, those
5 kind of fluid -- CO2 enriched fluid going to react
6 gradually or very slowly with your cement plugs.

7 And this is kind of like a
8 consideration factor when you place the cement plugs
9 and other mechanical plugs. Let's say the packers and
10 bridge -- bridge plugs, et cetera. Yeah.

11 DR. AMPOMAH: So then that is why we
12 need to know if your CO2 string, your composition, is
13 changing, then we need to know that and see how
14 compatible it is with your completion?

15 DR. WANG: Technically, yes.

16 DR. AMPOMAH: Dr. Wang and
17 Dr. Khaniani, thanks so much for your time today.

18 DR. WANG: Thank you.

19 DR. AMPOMAH: Thank you for your
20 service. Thank you.

21 DR. KHANIANI: Thank you, Dr. Ampomah.

22 THE HEARING OFFICER: Chair Chang, do
23 you have questions of this panel?

24 MR. CHANG: I do not have any questions
25 that haven't already been covered, so I appreciate

1 your time. Thank you.

2 THE HEARING OFFICER: Thank you.

3 DR. CHANG: Thank you.

4 DR. KHANIANI: Thank you.

5 THE HEARING OFFICER: Is there any
6 reason not to excuse this panel?

7 Mr. Tremaine, anything further?

8 MR. TREMAINE: Nothing further.

9 THE HEARING OFFICER: All right. Thank
10 you very much, gentlemen.

11 DR. KHANIANI: Thank you.

12 THE HEARING OFFICER: Will we bring up
13 the other panel? Should we take a short break?

14 MR. TREMAINE: If we could take a short
15 break and kind of rearrange. We do have -- I'm open
16 to the pleasure of the Commission. We have three
17 seats set up. I think we can add another table, three
18 microphones. So we have four. We're a little limited
19 on space, but it seems to be working better over there
20 than the alternatives.

21 THE HEARING OFFICER: Sounds good.
22 Let's take ten minutes. 11:25.

23 (Off the record.)

24 THE HEARING OFFICER: We are back after
25 a short break.

1 Do we need two more folks on this panel
2 or are they online? One more. Oh, yes. Okay.
3 Sorry.

4 MR. TREMAINE: We need one more and
5 he's in the room. Well, not in the room apparently.
6 In another room. Let me find him.

7 THE HEARING OFFICER: A much smaller
8 room, maybe. Okay.

9 Sorry, we're going to stand down for
10 two minutes.

11 (Off the record.)

12 THE HEARING OFFICER: All righty. We
13 are back after a short break. This is OCD's second
14 panel. Mr. Wrinkle, Dr. Schnarr, Mr. Eales, and
15 Ms. Raney.

16 Mr. Tucker, do you have questions of
17 this panel?

18 MR. TUCKER: I do. Thank you very
19 much.

20 THE HEARING OFFICER: Please go ahead.

21 CROSS-EXAMINATION

22 BY MR. TUCKER:

23 MR. TUCKER: Good morning, Panel.
24 Aaron Tucker on behalf of Oxy USA. I'd like to start
25 off by just thanking the Division and all the members

1 of the rule team staff for the work to put this
2 proposal together.

3 Oxy supports New Mexico's efforts to
4 obtain Class VI primacy and generally supports the
5 draft rules with some minor modifications. Towards
6 that end, I have a few clarifying questions I'd like
7 to ask today of the panel.

8 Mr. Wrinkle, I'd like to start with
9 you. On page 9 of your direct testimony, you testify
10 regarding OCD's automatic permit termination
11 provision. That proposed rule would provide that a
12 permit automatically expires if drilling operations
13 have not begun within that two-year window; correct?

14 MR. WRINKLE: That is correct. Yeah.

15 MR. TUCKER: Do the federal rules
16 include a similar automatic permit termination
17 provision?

18 MR. WRINKLE: I -- I believe they do,
19 but it's five years. I'm looking at Gregory to see if
20 he -- if he knows.

21 DR. SCHNARR: Off the top of my head, I
22 don't know, but I don't believe that they do.

23 MR. WRINKLE: Okay.

24 MR. TUCKER: All right. Thank you.
25 Could you please explain how the Division selected two

1 years for the automatic permitted -- permit
2 termination provision?

3 MR. WRINKLE: Yes. I -- I believe, you
4 know, when we were all together, you know, discussing,
5 you know, what we would like to go more stringent
6 upon, we landed on two years. Because in the past, I
7 believe that we -- we've had, you know, issues with --
8 with operators not moving forward on projects. And we
9 believe that two years was ample time, plus you get an
10 extension as well.

11 MR. TUCKER: When you're talking about
12 past projects, you're not referring to Class VI
13 projects; right? This --

14 MR. WRINKLE: No, because we -- well,
15 you know, we haven't had primacy over those yet.

16 MR. TUCKER: What types of projects did
17 you work -- did you -- were you --

18 MR. WRINKLE: A menagerie of them.
19 Mostly UIC, though. More complicated Class IIs, AGIs,
20 things of that nature.

21 MR. TUCKER: Class II wells. Okay. As
22 you mentioned, the proposed rules also allow operators
23 to request an extension; correct?

24 MR. WRINKLE: Yes.

25 MR. TUCKER: What situations of -- or

1 circumstances did the Division have in mind when it
2 allowed -- when it proposed to allow operators to
3 request an extension of time?

4 MR. WRINKLE: Sure. And -- and that
5 can be a -- a numerous different things; right? Right
6 of ways, you know, plugging operations for wells, you
7 know, that -- that are in the AoR. You know, material
8 sourcing, that kind of thing that -- that, you know,
9 they may be two years out for certain, you know,
10 chrome products or things like that.

11 So any anything that's justifiable,
12 right, that -- that is out of the applicant's hand
13 could potentially be a justification for that
14 extension grant.

15 MR. TUCKER: Thank you. I'd like to
16 move on to a different topic now, to D2 appeals.

17 MR. WRINKLE: Yes.

18 MR. TUCKER: So Mr. Wrinkle, in your
19 rebuttal testimony on page 2, you testified -- and
20 this is responding to Oxy's proposal. That appeals
21 process is already incorporated into the Division's
22 regulatory framework, which would be applicable to the
23 proposed Class VI program. Is that correct?

24 MR. WRINKLE: Correct.

25 MR. TUCKER: And in your rebuttal

1 testimony, you were referring to the procedures in
2 19.15.4.8 NMAC; correct?

3 MR. WRINKLE: Yeah. I mean, I -- I
4 trust you, but let me just look. But yeah, it's -- it
5 is that referenced rule.

6 MR. TUCKER: Do the proposed Class VI
7 Rules specifically reference that provision?

8 MR. WRINKLE: No, I don't think so.
9 And I -- I don't really know if they -- if it needs to
10 or not, but -- but I do not think they -- they point
11 to that specific NMAC.

12 MR. TUCKER: Would the proposed Class
13 VI Rules provide better regulatory clarity if they
14 referenced that procedure, or that provision?

15 MR. WRINKLE: I'm not sure. It --
16 possibly. But -- but, you know, other -- other rules
17 that are out there as well where you can use that
18 adjudicatory process, you know, on -- on that. I'm
19 not sure if it would add any value or not.

20 MR. TUCKER: Okay. Thank you.
21 Mr. Wrinkle, that's all the questions I have for you.

22 Dr. Schnarr, is that right? Do I have
23 that right?

24 DR. SCHNARR: Yes.

25 MR. TUCKER: Okay. Thank you.

1 Dr. Schnarr, I'd like to turn to some questions for
2 you. I'd like to start by discussing the area of
3 review reevaluation frequency.

4 The federal standard for the area of
5 review reevaluation frequency, that's at 40 C.F.R.
6 146.84(e), has two provisions addressing when a
7 reevaluation must be performed; correct?

8 DR. SCHNARR: Yes.

9 MR. TUCKER: First, there's a fixed
10 frequency not to exceed five years. And then a second
11 provision that is triggered when monitoring and
12 operational conditions warrant. Is that fair?

13 DR. SCHNARR: Correct.

14 MR. TUCKER: Okay. I'd like to turn to
15 that second provision of 146.84(e). Is it your
16 understanding that the provision, when monitoring an
17 operational conditions warrant, generally encompasses
18 situations when monitoring data and modeling
19 predictions differ significantly?

20 DR. SCHNARR: Yes. It -- and when
21 operational conditions vary from what the permit had
22 listed. So these are criteria that are defined in the
23 project's area of review and corrective action plan.

24 MR. TUCKER: So monitoring in that
25 evaluation process is happening prior to the fixed

1 frequency, kind of in the first provision. Is that
2 correct?

3 DR. SCHNARR: If I understand the
4 question, there may be instances where a reevaluation
5 is triggered prior to the fixed frequency because of,
6 as you said, monitoring data that doesn't comport with
7 the modeling or other operational conditions that
8 aren't exactly in line with the permit.

9 MR. TUCKER: And OCD incorporated that
10 second provision when monitoring an operational
11 conditions warrant into the proposed rules; correct?

12 DR. SCHNARR: Yes.

13 MR. TUCKER: Okay. But OCD is
14 proposing an area of review reevaluation schedule
15 based on a fixed frequency that differs from the
16 Federal Rule; correct?

17 DR. SCHNARR: Yes.

18 MR. TUCKER: There's an initial
19 reevaluation period two years after injection begins,
20 and then subsequent reevaluations not exceeding four
21 years?

22 DR. SCHNARR: Yes.

23 MR. TUCKER: What technical kind of
24 sources did OCD rely on to decide on that two-year
25 initial reevaluation period?

1 DR. SCHNARR: In drafting the rules and
2 working with OCD, the decision was made that at two
3 years would be the first time that -- a practical time
4 where there would be sufficient data and enough time
5 to allow for a model evaluation. And in the team's
6 experience, it's -- it was determined to be prudent to
7 require a reevaluation at two years.

8 But I will say that that reevaluation
9 process, if everything lines up with your monitoring
10 and your modeling, that reevaluation process may
11 include just a demonstration that your existing
12 modeling is sufficient. So it doesn't necessarily
13 mean you need to change the model. It's just a formal
14 time period to compare your modeling data and your
15 monitoring data.

16 MR. TUCKER: Given that subsurface
17 geology is site-specific and injection rates may vary
18 for a project, is it always true that the modeling can
19 be verified within that two-year period?

20 DR. SCHNARR: The team's decision was
21 that two years would be enough time to collect
22 pressure data. And although projects are -- are
23 different, there is a requirement for pressure data to
24 be collected in the injection zone, and that two years
25 of pressure data should be sufficient to compare to

1 the model predictions.

2 MR. TUCKER: Okay. Are you aware of
3 any other states that have adopted an area of review
4 reevaluation period as short as New Mexico is
5 proposing?

6 DR. SCHNARR: There may be, but I am
7 not aware of one.

8 MR. TUCKER: Okay. Thank you.
9 Dr. Schnarr, I'd like to turn to another topic,
10 groundwater monitoring. OCD is proposing to specify
11 that groundwater monitoring must occur at a fixed
12 quarterly frequency. Is that correct?

13 DR. SCHNARR: Yes.

14 MR. TUCKER: What was the basis for
15 selecting quarterly monitoring?

16 DR. SCHNARR: Quarterly monitoring is
17 actually very common in groundwater monitoring
18 compliance programs. And it's because there may be
19 seasonal impacts. And so -- and in practice, most CCS
20 projects I've ever seen actually do perform that above
21 confining zone groundwater monitoring quarterly. So
22 it was based on those factors.

23 MR. TUCKER: But the federal
24 requirements prescribe it as periodic and kind of
25 leave it up to the discretion of the agency to

1 determine what's appropriate.

2 DR. SCHNARR: It -- in some sense, but
3 it is -- it is part of the initial permit application
4 to define that periodic frequency. So it is subject
5 to the -- to that agency's approval as part of the
6 initial permit review.

7 MR. TUCKER: By prescribing a specific
8 frequency, would OCD have authority to vary the
9 frequency based on either site-specific geology or the
10 life of the project?

11 DR. SCHNARR: They would be able to, I
12 believe, require something that would be more
13 frequent, but not less frequent than quarterly.

14 MR. TUCKER: Okay. Thank you,
15 Dr. Schnarr. That's all the questions I have for you.

16 Mr. Eales, I'd like to turn to you, if
17 I may. I'd like to start by asking about the type of
18 logs required by the proposed rule. The proposed rule
19 requires resistivity, spontaneous potential, gamma
20 ray, porosity, and fracture finder logs; correct?

21 MR. EALES: That's correct.

22 MR. TUCKER: Mr. Eales, would you mind
23 sitting more into the microphone? It's a little hard
24 to hear.

25 MR. EALES: There we go. That's

1 correct.

2 MR. TUCKER: Great. Thank you very
3 much. Did you review the testimony from the Center
4 for Biological Diversity, Dr. Helm-Clark, recommending
5 that spontaneous potential should be an optional log
6 because newer logging methods provide better
7 information?

8 MR. EALES: Yes, I did.

9 MR. TUCKER: Do you agree with
10 Dr. Helm-Clark that gamma ray logging supplemented by
11 resistivity logging provides better information than
12 spontaneous potential?

13 MR. EALES: And on that one, it's -- I
14 am not a logging expert as an SME. Where we sit on
15 keeping it included was because it was a minimum
16 requirement -- requirement within Class VI EPA. I
17 would redirect that one to Dr. Wang.

18 MR. TUCKER: Okay. Thank you. Are you
19 aware of concerns that spontaneous potential logs can
20 increase the risk to well integrity?

21 MR. EALES: No.

22 MR. TUCKER: Did you review the
23 testimony of Oxy's witness, Ms. Wallace, raising that
24 concern?

25 MR. EALES: Yes, I did.

1 MR. TUCKER: Okay. So did the Division
2 take those concerns about well integrity into account
3 when it included spontaneous potential in the rule?

4 MR. EALES: I would have to, again,
5 direct that to Dr. Wang on his review of that. I'm
6 not aware of -- of that happening. No.

7 MR. TUCKER: Okay. And then just my
8 final question here. If alternative logging methods
9 provide better information in a safer manner than a
10 required test, does that make the rule less stringent
11 than federal requirements?

12 MR. EALES: I would say no to your
13 question. So reiterate the question one more time if
14 you could.

15 MR. TUCKER: If alternative logging
16 methods provide better information in a safer manner
17 than a required test, does that make the rule less
18 stringent than federal requirements?

19 MR. EALES: I think -- you know,
20 following your verbiage, if a logging suite provided
21 better information, that makes it more stringent, more
22 valuable.

23 MR. TUCKER: All right.

24 MR. EALES: As long as it is covering
25 the same expectations and requirements.

1 MR. TUCKER: Thank you, Mr. Eales.
2 That's all the questions I have for you.

3 And Ms. Raney, I have no questions for
4 you, so I'm done with the panel. Thank you very much.

5 THE HEARING OFFICER: Thank you,
6 Mr. Tucker.

7 Ms. Gutierrez, do you have any
8 questions for NMOGA?

9 MS. PORTMESS: Madam Hearing Officer,
10 Ms. Gutierrez had to step away. NMOGA has no
11 questions for these witnesses. Thank you.

12 THE HEARING OFFICER: All right. Thank
13 you very much.

14 Ms. O'Grady.

15 MS. O'GRADY: Thank you, Madam Hearing
16 Officer. I will have questions for Dr. Schnarr and
17 Mr. Eales. My co-counsel, Rose Rushing, will have
18 questions directed at Mr. Wrinkle and Ms. Raney. And
19 I will start us off with some questions for
20 Dr. Schnarr.

21 DR. SCHNARR: I can't see you.

22 MS. O'GRADY: No worries.

23 DR. SCHNARR: There we go.

24 MS. O'GRADY: Yeah. We're all
25 clustered up here.

1 CROSS-EXAMINATION

2 BY MS. O'GRADY:

3 MS. O'GRADY: Starting with some
4 questions about the PISC. What is the default post-
5 injection site care duration in the proposed rule?

6 DR. SCHNARR: Fifty years.

7 MS. O'GRADY: And you testified about
8 the Division's proposal regarding a demonstration of a
9 shorter alternative time frame?

10 DR. SCHNARR: The proposed rule is
11 identical to the Federal Rule in this case.

12 MS. O'GRADY: You testified during your
13 summary of direct testimony that if a project is, for
14 example, planning to inject for five years, the
15 operator may be able to show that the pressures will
16 dissipate fairly quickly, and thus warrant a shorter
17 PISC period; correct?

18 DR. SCHNARR: Yeah, that is correct.

19 MS. O'GRADY: You also testified back
20 on slide 7 of your demonstrative that models,
21 especially at the outset, will have some level of
22 uncertainty.

23 DR. SCHNARR: That is true, but -- that
24 is correct. Yes.

25 MS. O'GRADY: Is it possible a

1 shortened PISC period granted at the permitting stage
2 could be based on data not yet tested with operations?

3 DR. SCHNARR: That is correct. But
4 that is why, at the end of the day, one cannot end
5 their monitoring during post-injection site care until
6 they've made a non-endangerment demonstration.

7 So the default PISC is a guide prior to
8 the -- during the permit application phase. But it is
9 not the final word on when the post-injection site
10 care period ends.

11 MS. O'GRADY: What is the minimum
12 period of time to which this period could be shortened
13 as granted during the permitting phase?

14 DR. SCHNARR: There is no minimum time
15 that is listed in the federal or their proposed New
16 Mexico Rule.

17 MS. O'GRADY: To your knowledge, has
18 any Class VI project in the United States completed
19 post-injection site care?

20 DR. SCHNARR: No. I don't believe any
21 Class VI project has.

22 MS. O'GRADY: And again, to your
23 knowledge, has any Class VI project in the U.S.
24 received site closure approval?

25 DR. SCHNARR: I think that might be the

1 same question, but no, I don't believe that any
2 project has.

3 MS. O'GRADY: Relatedly, you testified
4 during your summary of direct testimony that after
5 injection, the risks don't disappear immediately.

6 DR. SCHNARR: Yes. After injection
7 ends, the risks are -- are still present, which is why
8 there is a post-injection site care period.

9 MS. O'GRADY: How long after injection
10 ends does it take for the pressure to return to its
11 original state?

12 DR. SCHNARR: Well, that's a very
13 project-specific question. And it also is not the
14 only measure of the potential risks. So it's not only
15 a looking at when the pressure returns to its
16 baseline. There are other considerations, I would --
17 I would say.

18 MS. O'GRADY: Could the plume
19 presumably keep moving while the pressure remains
20 elevated after closure?

21 DR. SCHNARR: Yes. The non-
22 endangerment demonstration and the alternative post-
23 injection site care time frame evaluation both include
24 assessment of the plume migration and the pressure
25 decline.

1 MS. O'GRADY: Would the monitoring
2 continue until the plume has ceased to migrating?

3 DR. SCHNARR: Again, that is actually
4 project-specific. And there may be some cases where
5 there's very minor movement. But this is covered in
6 the EPA guidance, and it is a project-specific
7 determination of when that monitoring can end.

8 MS. O'GRADY: Thank you. Turning to
9 the area of review and abandoned wells, you led
10 portions of the federal rulemaking related to
11 computational modeling.

12 DR. SCHNARR: That's correct.

13 MS. O'GRADY: Would you agree that
14 reasonable modelers using the same data could produce
15 materially different area of review boundaries?

16 DR. SCHNARR: Well, that's a fairly
17 open-ended question. And I guess that circumstance
18 could happen. And it's pretty typical for modelers to
19 have some differences in their results. But I -- I'd
20 say I'm not sure exactly what you mean by materially.

21 MS. O'GRADY: You could have a
22 different idea of what the area of review would be
23 based on different modeling outcomes based on the same
24 data?

25 DR. SCHNARR: Well, that might be. But

1 again, I'm not sure if your, you know, minor
2 differences versus significantly different answers. I
3 would -- I would say I -- I -- I'm not sure I would
4 agree that they would have remarkably different
5 answers.

6 MS. O'GRADY: Would you agree that
7 abandoned wells with incomplete records or inadequate
8 plugging may -- inadequate plugging records, that they
9 would require conservative evaluation?

10 DR. SCHNARR: Yes.

11 MS. O'GRADY: Does the rule presume
12 that a well within the AoR lacking reliable plugging
13 records is a potential conduit unless shown otherwise?

14 DR. SCHNARR: I -- I think that is
15 consistent with the -- the general framework of the
16 Class VI program and the rules. Yes.

17 MS. O'GRADY: And CO2 can be corrosive?

18 DR. SCHNARR: It can be. Yes.

19 MS. O'GRADY: Does corrective action
20 under the Division's proposals require re-plugging of
21 any existing penetrations with CO2 resistant cement?

22 DR. SCHNARR: I actually may kick that
23 to Mr. Eales on -- on plugging requirements.

24 MS. O'GRADY: Okay. Turning now to
25 another topic. Your testimony does not address pore

1 space; correct?

2 DR. SCHNARR: Maybe you could clarify
3 what you mean by pore space.

4 MS. O'GRADY: Ownership of pore space,
5 management of pore space?

6 DR. SCHNARR: That is correct.

7 MS. O'GRADY: Nor does it address
8 unitization?

9 DR. SCHNARR: That is correct.

10 MS. O'GRADY: And the area of review is
11 delineated by computational modeling of the plume and
12 pressure front; right?

13 DR. SCHNARR: Yes.

14 MS. O'GRADY: But there's no fixed
15 radius in the proposed rules about how far an AoR
16 should extend?

17 DR. SCHNARR: That is correct.

18 MS. O'GRADY: So the AoR would be
19 defined by geology, not by property boundaries?

20 DR. SCHNARR: Yes. And -- and this is
21 also identical to the Federal Rule in this case.

22 MS. O'GRADY: Yeah. I guess to jump
23 ahead a little bit, since you just identified that.
24 So these rules really mirror the federal rules with
25 some changes.

1 DR. SCHNARR: That was the intent.

2 Yes.

3 MS. O'GRADY: And there are certain
4 portions of the regulatory regime that would be needed
5 in New Mexico that are not in these rules?

6 DR. SCHNARR: No, I would not say that.

7 MS. O'GRADY: Did you hear the State
8 Land Office's public comment? Oh, you would not say
9 that. Sorry.

10 DR. SCHNARR: You said there are --
11 well, maybe repeat the question.

12 MS. O'GRADY: Are there regulatory --
13 are there pieces of a regulatory scheme that would be
14 needed to permit projects in New Mexico that are not
15 included in this rulemaking?

16 DR. SCHNARR: Well, when you say
17 permit, I'll -- I'll clarify. Do you mean Class VI
18 permit to construct and operate a -- a Class VI
19 injection well?

20 MS. O'GRADY: Yes.

21 DR. SCHNARR: No. The -- the intent of
22 this rulemaking is for OCD to have oversight and the
23 ability to permit Class VI injection wells.

24 MS. O'GRADY: Did you hear the State
25 Land Office's public comment yesterday highlighting

1 some concerns about what is not included in this
2 rulemaking?

3 DR. SCHNARR: Yes.

4 MS. O'GRADY: Once the EPA grants
5 primacy, will the Division start permitting projects?

6 DR. SCHNARR: Well, I may defer that
7 to -- to Mr. Wrinkle. I -- I guess I also don't quite
8 understand your question, but the intent is for OCD to
9 have the permitting and the primacy authority to
10 manage the Class VI program.

11 MS. O'GRADY: And Mr. Wrinkle, please
12 feel free to jump in here. I guess to clarify my
13 question, will the Division start permitting
14 regardless of whether a subsequent rulemaking has been
15 conducted to address missing or regulatory provisions
16 that are not in this rulemaking that may be necessary
17 to adequately permit a project in New Mexico? For
18 example, unitization.

19 MR. WRINKLE: You know, I don't -- I
20 don't know if I'm really qualified to -- to answer
21 that, you know, being the operational side of things.
22 You know, if we are granted primacy after the EPA --
23 you know, after this, the rule is promulgated, EPA
24 grants us primacy, then -- then yeah, we -- we will
25 begin, you know, reviewing applications.

1 And if anything comes up that is, I
2 guess, chicken before the egg, right, you know, then
3 we can incorporate that if -- if that does happen.

4 MS. O'GRADY: Okay. Thank you. Just
5 to complete my questions from before, because I didn't
6 invite Mr. Eales to answer, turning back to the
7 question of CO2 being corrosive, would you agree that
8 CO2 can be corrosive?

9 MR. EALES: Yes, it can be.

10 MS. O'GRADY: And --

11 MR. EALES: Again, yes, it can be.

12 MS. O'GRADY: Thank you. And does
13 corrective action under the Division's proposals
14 require re-plugging of any existing penetrations
15 within the AoR with CO2 resistant cement?

16 MR. EALES: Yes. And let me add more
17 to my first answer. So CO2 itself is not corrosive,
18 but CO2 and water is corrosive. So there's a little
19 variance there.

20 And to answer your second, yes,
21 19.15.43(e)(b) requires the operator to identify all
22 penetrations of any wells that are in the AoR, and the
23 materials those wells are made of, whether or not
24 they're compatible with CO2.

25 MS. O'GRADY: Okay. Thank you.

1 MR. EALES: Yeah.

2 MS. O'GRADY: And Mr. Eales, I'll turn
3 to you now, actually.

4 MR. EALES: Yeah.

5 MS. O'GRADY: So I think we're all done
6 with Dr. Schnarr for now. Thank you.

7 Starting with emergency staffing, are
8 you aware that Conservation Group's proposal regarding
9 emergency staffing states the owner or operator must
10 have -- actually, let me back up.

11 You testified in your rebuttal
12 testimony, I believe, about Conservation Group's
13 proposal regarding emergency staffing?

14 MR. EALES: Yes, that's correct.

15 MS. O'GRADY: Okay. And are you aware
16 that the proposal reads, "The owner or operator must
17 have at least one employee on the premises or
18 otherwise available at all times with the authority to
19 carry out the emergency and remedial response plan"?

20 MR. EALES: Yes.

21 MS. O'GRADY: So the proposal would
22 require that either someone be on the premises or
23 otherwise available?

24 MR. EALES: Yes, that's correct.

25 MS. O'GRADY: So the requirement is not

1 that there necessarily be someone on site?

2 MR. EALES: That's correct.

3 MS. O'GRADY: Turning to automated
4 shutdown systems, you discuss in your direct testimony
5 the use of automated shutdown systems, yes?

6 MR. EALES: That's correct. Yes.

7 MS. O'GRADY: An automated shutdown
8 system can detect anomalies and shut in a well?

9 MR. EALES: Yes, it can.

10 MS. O'GRADY: Can an automated shutdown
11 system assess whether a seismic event is open to
12 fault?

13 MR. EALES: Yes, it can.

14 MS. O'GRADY: Can an automated shutdown
15 system coordinate with emergency responders?

16 MR. EALES: Yes.

17 MS. O'GRADY: Can it execute the
18 judgment calls an emergency plan response requires?

19 MR. EALES: It depends on how -- you
20 know, how robust that system is, of course. So yes,
21 it can in theory, but all scenarios being contemplated
22 in advance would be difficult to program in an
23 automated system.

24 MS. O'GRADY: Can an automated shutdown
25 system fail?

1 MR. EALES: Yes, it can.

2 MS. O'GRADY: If an automated shutdown
3 system were to fail, approximately how long would it
4 take to stop an unauthorized release of CO₂, including
5 the time needed to discover the source of the release?

6 MR. EALES: That would depend upon the
7 system. There's various systems that are in -- in
8 series as part of a protective defense. So each one
9 would have a -- a different mechanism or a different
10 role to shut in.

11 MS. O'GRADY: Can you talk a little bit
12 about what that would look like in a community or
13 neighborhood, or perhaps in an extremely rural area,
14 like on Navajo Nation?

15 MR. EALES: Yeah. So one of the
16 protective systems is a subsurface safety valve that's
17 referenced. That one actually is a lot of fail safes.
18 So it's -- it can be actuated remote. It can also,
19 just from a mechanical fail safe, just create
20 basically a check valve. So if there was a problem,
21 it would snap a check valve and stop any flow up from
22 the well.

23 The main thing that is very important
24 with an injection well is they are inherently designed
25 to inject into a formation that is more or less on a

1 vacuum or very low pressure. So if injection stops,
2 that more or less stops the potential of coming back
3 from the well. It's -- it's possible, but it's not a
4 scenario of a producing well that has, you know, built
5 up pressure.

6 So from a -- from a community
7 standpoint, there are the multiple barriers of
8 protection in place, which these are in place to kind
9 of address what you're asking. And that is, yes,
10 there could be one failure mode, but to have two,
11 three, or four failure modes, they call it a Swiss
12 cheese model. If you have multiple barriers, which we
13 have in the standard, it's very unlikely that all
14 would fail at one time.

15 MS. O'GRADY: And to clarify my earlier
16 question, I should have asked areas adjacent to Navajo
17 Nation that are rural, as, of course, this program
18 would not regulate injection sites specifically on
19 Navajo Nation.

20 And you said it's very unlikely that
21 all of these failure points would fail, but there is a
22 possibility; correct?

23 MR. EALES: Always a possibility. Yes.

24 MS. O'GRADY: You stated in your
25 summary of rebuttal that you oppose the Center for

1 Biological Diversity's plans to require emergency
2 response training mandates because you believe the
3 proposed plan can be adapted by state and local
4 responders?

5 MR. EALES: Yes. And elaborating on
6 that, the standard itself does have requirements to
7 provide training to emergency responders. But the
8 level of detail that was provided by CBD is what we
9 found to be more into the area of what those
10 responders' expertise is.

11 So that's -- that was -- the -- the
12 reason, as the standard itself already has a
13 requirement for that training that we felt was
14 sufficient.

15 MS. O'GRADY: In your summary of
16 rebuttal, you stated that you think mandatory peak
17 ground velocity and peak ground acceleration
18 thresholds are too rigid.

19 MR. EALES: Oh, actually, I didn't say
20 too rigid. My -- what my response was was the peak
21 ground velocity and -- and those terms are very
22 specific to seismometers and the seismic programs.
23 And the New Mexico Bureau of Environmental Geology is
24 the entity that specifies the level of quality and
25 measurements that need to be taken to meet their

1 standard.

2 So the regulation specifies the
3 requirement for a seismometer that meets the state's
4 BEGs, the state's requirements. So it -- it's not
5 adverse to that as an idea, but that being outside of
6 OCD's scope.

7 MS. O'GRADY: You don't offer
8 justification for the use of other seismic metrics
9 instead, though? If I hear you correctly, you're just
10 deferring to the OCD?

11 MR. EALES: Yeah. To the -- to the
12 BEG. Yeah. And if you don't mind, on your earlier
13 question that was diverted to me from Greg, the
14 follow-up question I think you had was the materials
15 and how you identify the materials to plug the wells.
16 So just wanted to say that's also covered in the
17 standard too. And it's in the same section I referred
18 to as a subpoint below that.

19 MS. O'GRADY: That's all I have for
20 you, Mr. Eales.

21 MR. EALES: All right.

22 MS. O'GRADY: Thank you.

23 MR. EALES: Thank you.

24 THE HEARING OFFICER: Is that all for
25 the panel?

1 MS. RUSHING: I have a -- I'll do
2 questions for Mrs. Raney and Mr. Wrinkle, if that's
3 all right.

4 THE HEARING OFFICER: All right. Go
5 ahead.

6 PUBLIC/OPEN FORUM: Good morning or
7 almost good afternoon, Commission. Thank you.

8 CROSS-EXAMINATION

9 BY MS. RUSHING:

10 MS. RUSHING: And Ms. Raney, I'd like
11 to start with directing some questions to you. Did
12 you oversee the Public Outreach Program throughout the
13 development of the proposed rules?

14 MS. RANEY: The portions that I
15 discussed in my testimony, yes.

16 MS. RUSHING: Was the purpose of your
17 testimony to demonstrate the required public outreach
18 and community engagement that was conducted during
19 development of these proposed rules?

20 MS. RANEY: Yes.

21 MS. RUSHING: Regarding tribal
22 consultation, you testified that you sent out 23
23 letters to tribes and ultimately had two meetings, one
24 with Jicarilla Apache, and one meeting with the
25 representative of the Navajo Nation EPA; correct?

1 MS. RANEY: Correct.

2 MS. RUSHING: Did you have any contact
3 with the other 21 tribes?

4 MS. RANEY: In an official capacity
5 under the Class VI Rule under the guidance of OCD, not
6 directly. However, informally, I engage with many of
7 the pueblos and membership of tribal nations on a
8 routine basis where this is brought up in
9 conversation.

10 MS. RUSHING: Are any of those
11 communications documented or a part of the record in
12 this proceeding?

13 MS. RANEY: They were not requested to
14 be. No.

15 MS. RUSHING: Okay. So on the record,
16 you sent 23 letters and met with two tribes. That's
17 approximately a 9 percent contact rate. Is that
18 successful tribal consultation in your opinion?

19 MS. RANEY: I would not necessarily
20 equate it to the number of tribal nations that we
21 communicated with. As I mentioned before in my
22 testimony, the -- the tribal nations that were
23 contacted were primarily based on which ones would
24 likely be eligible for a Class VI project based on the
25 geological information and location of the reservation

1 of the pueblo.

2 So seeing as the Navajo Nation is one
3 of the largest nations by land, that would be the
4 priority, as well as the Jicarilla Apache. You also
5 want to look at the background and the existing
6 infrastructure of each nation. How far along would
7 they be in that process? What would it take to get to
8 an actual Class VI project? The characterization, the
9 amount of work involved and the construction. It is a
10 robust process. And Jicarilla Apache Nation has a
11 well-established history of oil and gas operations and
12 a very strong knowledge of the subsurface as well as
13 the Navajo Nation.

14 MS. RUSHING: Okay. So did you -- so
15 you mentioned this robust process. Is -- are you
16 referring to just sort of your ongoing work with the
17 PW -- or the PRRC, or are you -- is this about the
18 Class VI Rule?

19 MS. RANEY: It's more the -- the data
20 that would be involved in doing an assessment or
21 scoping for a Class VI project. So knowledge of
22 the -- the deep geology in those deep reservoirs where
23 injection would occur.

24 Unless you have oil and gas presence or
25 data it's -- it's rare to have that knowledge or any

1 cores or well logs to that depth that would be taken.

2 MS. RUSHING: Okay. So just to
3 clarify, there wasn't formal consultation with 21 of
4 the 23 tribes, but you are aware that some of the
5 tribes may be impacted by Class VI development is what
6 I'm hearing?

7 MR. TREMAINE: Objection. Misstates
8 testimony. Ms. Raney testified that formal
9 consultation letters were sent out. That is formal
10 consultation. We can examine that in more detail.
11 But the premise of the question stated that formal
12 consultation was not conducted. So I object to the
13 form of the question.

14 THE HEARING OFFICER: All right. Okay.
15 Would you rephrase your question,
16 please?

17 MS. RUSHING: I can move on.

18 BY MS. RUSHING:

19 MS. RUSHING: Are you familiar with the
20 New Mexico straight -- State Tribal Collaboration Act?

21 MS. RANEY: Not in depth.

22 MS. RUSHING: You didn't submit as any
23 of your exhibits OCD guidance or recommendations for
24 how to comply with the New Mexico State Tribal
25 Collaboration Act. Did they provide you with guidance

1 or recommendations for how to comply with the State
2 Tribal Collaboration Act?

3 MS. RANEY: I don't recall that
4 specifically outside the scope of a Class VI primacy
5 rulemaking effort.

6 MS. RUSHING: Are you -- was this rule
7 ever translated into Dine Bizaad, Keres, Tiwa, or any
8 other indigenous language?

9 MS. RANEY: The entire rule was not
10 translated. No. However, during any educational
11 events, we did make it available if translation
12 services were available, and also would be able to
13 seek translators who could translate that material
14 upon request.

15 MS. RUSHING: Are you aware that Dine
16 Bizaad is the official language of Navajo Nation, not
17 English?

18 MS. RANEY: Yes.

19 MS. RUSHING: Was this rule ever
20 translated into Spanish?

21 MS. RANEY: Again, it was not requested
22 to be translated, but it could be translated upon
23 request.

24 MS. RUSHING: So just to confirm, no
25 translation of this rule was ever created, published,

1 or publicized in Spanish, Dine Bizaad, or any Pueblo
2 language?

3 MS. RANEY: Not to my knowledge in its
4 entirety. No.

5 MS. RUSHING: Okay. So therefore, no
6 translated version of this rule could have been sent
7 to tribes in any follow-up letters or anything like
8 that, if it doesn't exist?

9 MS. RANEY: Not that I -- no.

10 MS. RUSHING: Do you feel that you
11 adequately received the input of New Mexico's tribal
12 governments and communities and were able to
13 incorporate those comments into the rule?

14 MS. RANEY: The Class VI primacy effort
15 was on behalf of the State of New Mexico. And since
16 these are sovereign nations, we do not dictate or --
17 or we were not contracted to provide guidance to
18 separate sovereign nations or tribal governments. It
19 was -- our role was to inform them of the procedures
20 taking place within the state of New Mexico.

21 MS. RUSHING: Moving on to Outreach.
22 You testified that an Outreach meeting was held at San
23 Juan College due to the fact that a disproportionate
24 amount of Class VI projects will be proposed in the
25 San Juan Basin; correct?

1 MS. RANEY: I believe I said it was
2 more likely for a Class VI project to occur in that
3 area.

4 MS. RUSHING: Were any meetings held in
5 a community setting, a chapter house, school, library,
6 or community center?

7 MS. RANEY: We did reach out to the
8 Resource Development Committee to potentially have an
9 informational session. I did speak with members of
10 the Resource Development Committee about our
11 activities, and some attended some of our meetings.
12 But did they occur in person at the Chapter House?
13 No.

14 MS. RUSHING: So meetings were spoken
15 about and no meetings occurred?

16 MS. RANEY: Correct.

17 MS. RUSHING: So no meetings were held
18 in Counselor, Lybrook, Nageezi, or Shiprock?

19 MS. RANEY: Correct.

20 MS. RUSHING: Were any meetings open to
21 the public held on the Navajo Nation at all?

22 MS. RANEY: Open to the public as in an
23 informational session for the public. Okay.

24 MS. RUSHING: Not the meeting --

25 MS. RANEY: Okay. With -- or -- or

1 Yolanda, which was a separate meeting. Okay. No, not
2 at their request. I -- I -- we don't have authority
3 under this project to do informational sessions and
4 outreach on a separate tribal nation or government.

5 MS. RUSHING: In the meetings that did
6 occur, that you testified to throughout the state, how
7 many members of the general public attended?

8 MS. RANEY: I'm sorry. For all of them
9 collectively?

10 MS. RUSHING: Yes.

11 MS. RANEY: I would have to review my
12 notes if you will give me a minute to mull that over.

13 MS. RUSHING: Sure. And while you're
14 looking through your notes, can you see if there is
15 any attendance record in the record of this
16 proceeding?

17 MS. RANEY: To answer your second
18 question, is there any record of attendance? We did
19 capture some attendance, but by request, we did not
20 get permission to give out names of who attended, just
21 to honor the confidentiality and privacy of those
22 individuals. But we did capture their affiliation,
23 whether they were from academia, or industry, or
24 otherwise.

25 MS. RUSHING: Okay. We can move on.

1 How was feedback received at these meetings recorded?

2 MS. RANEY: We captured notes. Any
3 questions that were brought up during the meetings.
4 We summarized those notes after the fact, and we
5 relayed them to the team internally with OCD.

6 MS. RUSHING: You testified that
7 registration information for the initial stakeholder
8 workshops to develop the rule was emailed to pre-
9 selected groups and shared on the PRRC LinkedIn page;
10 correct?

11 MS. RANEY: Correct.

12 MS. RUSHING: Is LinkedIn a platform
13 that you would expect residents of the Eastern Navajo
14 Agency to use to learn of a stakeholder meeting?

15 MS. RANEY: I would certainly say some
16 of the individuals that are members of that tribal
17 nation would have access to LinkedIn. I -- I
18 personally have connections to a number of Navajo
19 members who are active on LinkedIn.

20 However, that was not the only method
21 of publication. For one of the events, they also --
22 one of our -- our contacts distributed some fliers at
23 the Eastern Navajo Fair to advertise the event as well
24 on paper.

25 MS. RUSHING: Okay. Did OCD conduct

1 any environmental justice or demographic screening to
2 identify affected communities before designing the
3 Outreach?

4 MS. RANEY: In a lot of the work that
5 we've done in our research at New Mexico Tech and
6 Environmental Justice and the -- that kind of
7 screening, we've evaluated the populations throughout
8 New Mexico and under the conditions of environmental
9 justice. If you look at a map, almost all of New
10 Mexico falls in that category.

11 MS. RUSHING: Yeah. Okay. Moving on
12 to the comment process. You testified that the Class
13 VI team is developing formal responses to comments
14 received. That was written in the present tense as of
15 June 29, 2026. Is that correct?

16 MS. RANEY: Correct.

17 MS. RUSHING: Have those formal
18 responses been completed today?

19 MS. RANEY: There are draft responses
20 to frequently asked questions that were completed upon
21 the initial review of the public comment period. That
22 is a -- still it's an ongoing process. And so we are
23 adapting that and extending that over time.

24 MS. RUSHING: You testified that many
25 or most suggestions from communities or NGOs could not

1 be incorporated because the program is required to
2 remain consistent with federal requirements; correct?

3 MS. RANEY: I don't remember saying
4 most of the comments could not be incorporated.

5 MS. RUSHING: Okay. I'm looking at
6 page 8 of your testimony. I guess maybe not most.
7 "Comments could not be incorporated." Moving on
8 though.

9 Dr. Schnarr testified that the state
10 may adopt requirements more stringent than the federal
11 minimum. Do you agree?

12 MS. RANEY: Yes.

13 MS. RUSHING: So a revision that would
14 make the program more protective would not be barred
15 by federal consistency, fair?

16 MS. RANEY: Not in all cases. In -- in
17 certain cases that I referred to into my testimony,
18 comments were received that were outside of the scope
19 of the Class VI Rules. For instance, the safety of
20 surface infrastructure, things on larger matters like
21 climate change, the need for this at all, standard
22 approaches to this. Those things aren't -- don't fall
23 within the scope of Class VI. So they -- they
24 wouldn't be eligible to be included in the rulemaking.

25 MS. RUSHING: Do you have a record of

1 how many comments and suggestions were rejected on the
2 basis that they were more stringent than the Federal
3 Class VI requirements?

4 MS. RANEY: We do have a -- a document,
5 a red line document, where comments were noted whether
6 or not we adopted them or what was done.

7 MS. RUSHING: Is that part of the
8 public record?

9 MS. RANEY: I will defer to Justin
10 Wrinkle on how those documents are distributed.

11 MR. WRINKLE: The -- the only one that
12 I'm aware of is we -- we issued a -- a Q&A document
13 that we posted on our website about all the comments
14 that we received, and why we made decisions on
15 incorporating or not incorporating those.

16 There -- there could be some -- some
17 other document in the background that -- that shows
18 some red lines, but I believe that is the final
19 manifestation of that.

20 MS. RUSHING: Thank you. Moving on.
21 Did you consult with other government agencies such as
22 the State Land Office or the Bureau of Land Management
23 who may be impacted by this permitting scheme?

24 MS. RANEY: Earlier on, we did inform
25 the State Land Office that we were taking this

1 approach, and we were entering into this process. And
2 then all direct communication was handled by OCD
3 directly subsequent to that.

4 MS. RUSHING: Okay. Is there a record,
5 to your knowledge, of the State Land Office or Bureau
6 of Land Management's suggestions or objections to this
7 draft rule? And if so, is that part of the record
8 here?

9 MS. RANEY: The State Land Office did
10 submit comments in the public comment period, which
11 was reviewed. And then the subsequent review and any
12 kind of direct exchange on that was handled directly
13 through OCD.

14 MS. RUSHING: Were any suggestions made
15 by the State Land Office or Bureau of Land Management
16 incorporated into the final rule?

17 MS. RANEY: I would have to look in
18 detail what -- if there was anything that State Land
19 Office said specifically that was not mentioned by
20 another party.

21 MS. RUSHING: Okay. Finally --

22 THE HEARING OFFICER: Ms. -- oh.

23 MS. RUSHING: Oh, I'm so sorry.

24 THE HEARING OFFICER: You have a final
25 one for Ms. Raney.

1 MS. RUSHING: Final one for her. And
2 then I'll have questions for Mr. Wrinkle, but I know
3 we're walking up on lunch.

4 THE HEARING OFFICER: Yes.

5 MS. RUSHING: Okay.

6 BY MS. RUSHING:

7 MS. RUSHING: Finally, you testified
8 that these requirements provide potentially affected
9 community members with meaningful opportunities to ask
10 questions, submit written comments, become adequately
11 informed regarding proposed Class VI activities. Is
12 there a meaningful opportunity in this process for
13 community members to object to Class VI activities in
14 their area?

15 MS. RANEY: At various stages along a
16 permit application process and a review process, any
17 party with significant interest in it could submit an
18 appeal or a request for hearing.

19 MS. RUSHING: Okay.

20 No further questions. Thank you. Or I
21 have questions for Mr. Wrinkle, but we could --

22 THE HEARING OFFICER: All right. Let's
23 take a lunch break till 1:15. And when we come back,
24 you can resume. Thank you.

25 MS. RUSHING: Thank you.

1 (Off the record.)

2 THE HEARING OFFICER: We're back after
3 a lunch break and the conservation groups have an
4 opportunity to finish their questioning of the second
5 Division panel.

6 Ms. Rushing?

7 MS. RUSHING: Thank you. Thanks
8 everyone for your patience. I just have a few more
9 questions for Mr. Wrinkle.

10 BY MS. RUSHING:

11 MS. RUSHING: Good afternoon. The
12 purpose of your testimony is intended to demonstrate
13 that the Division not only possesses the technical
14 foundation and staffing structure necessary to
15 administer the program, but is fully prepared to
16 implement science-based oversight to ensure the safe
17 and accountable development of geologic sequestration
18 projects in New Mexico; correct?

19 MR. WRINKLE: Yes. I believe that's
20 verbatim.

21 MS. RUSHING: Okay. Sorry. I'm a
22 little out of breath. I ate too much at lunch.

23 Okay. You testified that OCD is
24 staffing the Class VI program with a dedicated team of
25 three full-time employees; correct?

1 MR. WRINKLE: That is correct.

2 MS. RUSHING: What is the educational
3 background required for these new hires?

4 MR. WRINKLE: It's listed on our SPOC
5 website for that particular position. One of them is
6 a petroleum specialist supervisor, and the other two
7 are petroleum specialists.

8 We did include in those job
9 descriptions some extra things, you know, carbon
10 sequestration experience preferred, right, but not
11 required.

12 I don't know verbatim exactly what
13 those qualifications are, but I do know that it is a
14 mixture of a degree and experience in the field. So I
15 believe it comes out to ten years of degree plus
16 experience or just experience alone.

17 MS. RUSHING: And did you testify that
18 all three people on the team have been hired?

19 MR. WRINKLE: No. So two have been
20 secured and they have started. We have a third that
21 is coming on September 12th, tentatively.

22 MS. RUSHING: Excellent. Do any of
23 these staff members have experience in geologic
24 modeling, seismic monitoring, risk assessment, or
25 long-term CO2 plume analysis?

1 MR. WRINKLE: Some of those, yes.
2 The -- the -- what was the first thing that you
3 listed?

4 MS. RUSHING: Geologic modeling?

5 MR. WRINKLE: Yes. The others, they're
6 probably in a peripheral. But again, you know, we --
7 we do draw upon the entire staff of the engineering
8 bureau if we need to. And then, you know, specialized
9 contractors, of course.

10 MS. RUSHING: Getting to that, you
11 testified that the OCD will rely on specialized
12 technical contractors for supplemental expertise for
13 geologic modeling, seismic monitoring, risk
14 assessment, and long-term CO2 plume analysis; correct?

15 MR. WRINKLE: Yes, if needed.

16 MS. RUSHING: Okay. So are any
17 employees of OCD in the Class VI Division able to do
18 all of those things?

19 MR. WRINKLE: They're able to -- to
20 look at the guidelines that the implementational
21 provides. And then basically what that does is it
22 gives you -- what's the -- the best term for it?
23 Bumpers; right? You know, there's parameters in
24 there, there's best practices, that sort of thing,
25 that any person with a competent understanding can

1 assess and then know when they need to -- to seek any
2 specialized contractors.

3 MS. RUSHING: Okay. So would OCD be
4 able to replicate geologic or seismic modeling?

5 MR. WRINKLE: No. We -- we don't --
6 don't have that capability, but -- and I think it's
7 a -- a good time to bring it up. One of the flow
8 charts that I presented in the -- in my testimony, and
9 I apologize for this, the swim lane names were -- were
10 cut off on that.

11 And one of the swim lanes is where it
12 shows that you're looking at a model. Any type of
13 model that is provided to us, that's where, like, the
14 good doctors, if we did an MOA with tech would be
15 vetting those fours, the inputs of those models, that
16 type of thing. If you will, that would be our third
17 party tech vetting for that.

18 MS. RUSHING: So just to be clear,
19 there is no one on staff at OCD who's able to
20 replicate any of this modeling?

21 MR. WRINKLE: No. We -- you have to
22 have the specialized software, those type of things to
23 do so. We haven't required that yet.

24 MS. RUSHING: That was going to be my
25 next question. Does OCD have any software or hardware

1 that would allow them to conduct CCS modeling in-
2 house?

3 MR. WRINKLE: No. And I -- I don't
4 believe there's a -- a need to with, you know, the
5 utilizing. Not -- not trying to reinvent the wheel if
6 it's available through New Mexico Tech or some third
7 party.

8 MS. RUSHING: Is modeling and CO2 plume
9 analysis not a part of every single Class VI permit
10 application?

11 MR. WRINKLE: I -- I believe it -- it
12 is required to -- to distinguish your AoR.

13 MS. RUSHING: Okay. You testified that
14 your involvement with the Class VI Injection Well
15 Program began at the onset of the pursuit of primacy.
16 Also, that you oversee the Engineering Bureau, which
17 includes the field compliance program, the UIC
18 program, and the Class VI program. So are you the
19 final level of review for Class VI permit
20 applications?

21 MR. WRINKLE: I -- I wouldn't be
22 directly involved in that. It would be probably my
23 supervisor underneath me. But making sure that all
24 the, you know -- everything is met that is needed to
25 be met, then it would go for signature to our

1 director.

2 MS. RUSHING: Okay. So let me see.
3 You testified that the positions currently assigned to
4 support and administer Class VI programs are permanent
5 roles. Contractor services required to supplement
6 program activities will be financed through a
7 combination of existing funds and grant awards when
8 resources are available; correct?

9 MR. WRINKLE: Correct.

10 MS. RUSHING: Is there a chance that
11 OCD will be unable to secure the grants necessary to
12 pay for these specialized contractors?

13 MR. WRINKLE: Well, I think maybe I
14 worded that probably -- I should have been more
15 descriptive in that, meaning that grants are -- well,
16 they're kind of like a bonus at a job. Nice to get,
17 but it's not guaranteed.

18 So for -- like, when we're talking with
19 my management about funding for the Class VI, we are
20 totally dedicated for that to come out of general
21 fund. These are permanent positions. You know,
22 they -- they can't be -- you know, they're not term, I
23 guess.

24 But grants would help us cover some of
25 the costs. But at the end of the day, we -- we have

1 to maintain what we've told the EPA.

2 MS. RUSHING: Yeah.

3 MR. WRINKLE: And if we don't do that,
4 then the EPA can come back and revoke that primacy;
5 right? So it -- we have to pay for it. And where
6 that comes from is, you know, we -- we will pay for
7 it.

8 MS. RUSHING: So it's kind of a -- it's
9 a circle here. To get primacy, you need to have this
10 capacity or else the EPA will revoke primacy, but you
11 need the grants to be able to have that capacity?

12 MR. WRINKLE: No, we don't -- we don't
13 need the grants. There -- there -- they would just be
14 a bonus to help us out. Yeah.

15 MS. RUSHING: And just returning to
16 sort of just to wrap it up, there is no one in-house
17 at OCD, nor do you have the technology available to
18 replicate any modeling, and you will need to rely on
19 outside contractors for that. Are those outside
20 contractors paid for by the general fund, or is that
21 reliant on grants?

22 MR. WRINKLE: If -- if a grant is
23 available, then we would utilize that money. If not,
24 then it would be general fund or some other fund
25 that -- that, you know, the -- the powers that be

1 decide.

2 MS. RUSHING: What happens to the
3 permitting process if those -- that fund is not
4 available for outside contractors? Will the
5 permitting process be paused until OCD is able to
6 verify that modeling?

7 MR. WRINKLE: You're talking about like
8 a -- like a funding freeze, like for general fund,
9 like the state's completely out of money or --

10 MS. RUSHING: Never mind. We can move
11 on from that.

12 MR. WRINKLE: Okay.

13 MS. RUSHING: Are any of the three
14 permanent positions full-time field inspectors?

15 MR. WRINKLE: Not under -- directly
16 under Class VI, but in our EPA program description,
17 there will be, like, time riding field inspectors
18 for -- for these.

19 MS. RUSHING: So will Class VI field
20 inspection fall to the existing inspection force on
21 top of its current workload?

22 MR. WRINKLE: It -- currently, that is
23 the plan, yes.

24 MS. RUSHING: Okay. How many field
25 inspectors does OCD currently employ?

1 MR. WRINKLE: Oh, I'm going to -- I'm
2 going to guess. There's probably 18-ish.

3 MS. RUSHING: How many active oil and
4 gas wells does OCD regulate?

5 MR. WRINKLE: Oh, I -- I -- couldn't
6 tell you off the top of my head. Do you want an
7 approximation?

8 MS. RUSHING: That'd be great.

9 MR. WRINKLE: Okay. Active, I would
10 say 60,000.

11 MS. RUSHING: What percent of active
12 wells received an inspection last year?

13 MR. WRINKLE: I -- I don't know. I'd
14 have to pull that information.

15 MS. RUSHING: How many unauthorized
16 releases were reported to OCD in the most recent
17 reporting year?

18 MR. WRINKLE: I don't know. That's
19 not under my purview.

20 MS. RUSHING: Oil and gas companies
21 reported, according to the OCD database, 38,153 spills
22 in 2025, an average of 104 spills a day. Does that
23 number sound familiar to you?

24 MR. WRINKLE: No. I -- like I said, I
25 don't -- I don't -- I'm not the environmental bureau

1 chief, the engineering bureau chief.

2 MS. RUSHING: Okay. So who does the
3 enforcement of these violations at OCD?

4 MR. WRINKLE: So our -- our legal
5 department eventually does, you know, takes on the
6 enforcements. We recommend those up to our management
7 as bureau chiefs. And then management, you know,
8 moves forward with them or -- or not.

9 MS. RUSHING: And how many people
10 currently work in enforcement within the OCD?

11 MR. WRINKLE: I -- I'm not sure. I
12 don't think that there is an -- an exact enforcement
13 bureau, but it is basically everybody.

14 MS. RUSHING: Will any of the three new
15 Class VI staff members go to work on enforcement
16 specifically, or will the enforcement of the Class VI
17 program be added to the existing staff's caseload?

18 MR. WRINKLE: It -- it would -- it
19 would mirror what it -- what -- what happens now. So
20 any -- any one of the departments that report to me,
21 they see a potential violation, and it moves up the
22 chain of command. And then basically we do, you
23 know -- you know, some findings. We vet those
24 findings and then moves through that process to
25 eventually -- you know, potentially be a notice of

1 violation.

2 MS. RUSHING: But no one on this three-
3 person team will be dedicated to working on
4 enforcement?

5 MR. WRINKLE: Well, I -- I would say
6 it's part of their job duty; right? It's -- there --
7 there isn't, you know, I don't think need for a
8 dedicated individual for that.

9 MS. RUSHING: Thank you. Your resume
10 states that you are involved in the development and
11 education -- or execution of the Orphan Well Program;
12 correct?

13 MR. WRINKLE: The Orphan Well Program?

14 MS. RUSHING: The Orphan Well Program?

15 MR. WRINKLE: Yes.

16 MS. RUSHING: Are you familiar with the
17 Legislative Finance Committee's June 2025 policy
18 spotlight on orphaned wells?

19 MR. WRINKLE: Somewhat. I -- you know,
20 I -- I know the gist of it.

21 MS. RUSHING: Are you aware that it
22 found financial assurance posted by operators is
23 typically insufficient to cover plugging and
24 remediation costs?

25 MR. WRINKLE: Yes. I am aware of those

1 findings.

2 MS. RUSHING: Are you aware that it
3 found that OCD does not develop internal price
4 estimates and instead relies on vendor-submitted
5 estimates?

6 MR. TREMAINE: Objection. Scope. This
7 is -- production well bonding is an entirely different
8 matter than the proposed bonding under the Class VI
9 structure. And this is outside the scope of the
10 testimony and the hearing.

11 THE HEARING OFFICER: I believe
12 Mr. Tremaine has a good point.

13 MR. CHANG: Could I also just ask
14 Counsel and witnesses both to just speak ever so
15 slightly slower?

16 MS. RUSHING: Yeah.

17 MR. CHANG: Thank you.

18 MS. RUSHING: Apologies.

19 BY MS. RUSHING:

20 MS. RUSHING: So the connection here
21 that I was going for is asking for the Class VI
22 program. Will OCD conduct a review of financial
23 instruments and cost estimates for Class VI bonding?
24 And who at OCD will perform that review?

25 MR. WRINKLE: Yeah. It -- it is

1 included in the -- in the permitting process,
2 reviewing the -- the financial responsibility. The --
3 the quotes for PISC and -- and those type of things
4 are provided to -- to the -- will be provided to that
5 team and they will have to vet those.

6 Now, if it is a corporate guarantee or
7 self-assurance, that is handed off to, you know -- we
8 give a technical assessment for how much things
9 could -- could cost after we vet those. And then that
10 moves into our legal department that reviews those.

11 MS. RUSHING: Approximately how many
12 people currently work in cost or analysis for new
13 bonding for this program within the Oil Conservation
14 Division?

15 MR. WRINKLE: Well -- well, there is no
16 program yet, so zero.

17 MS. RUSHING: Okay. And is there any
18 plan to hire anyone to work on verifying applicant's
19 cost estimates?

20 MR. WRINKLE: If the workload requires
21 it, then I think the -- the OCD would -- would
22 seriously consider that. For right now, we forecasted
23 in our program description to the EPA that we will see
24 zero to eight applications in the first two years. So
25 we have to kind of weigh out our head count versus

1 workload. Correct.

2 MS. RUSHING: So before adding staff
3 members that would be capable of verifying the
4 estimated cost of bonding, you're going to wait and
5 see how many permit applications you receive?

6 MR. WRINKLE: No. What I'm saying is
7 that the current -- the current people that were hired
8 are capable of vetting, you know, how much things
9 would cost. We have folks that sit in engineering
10 right now with over 40 years of plugging experience,
11 you know, hundreds of years of experience spread out
12 through them on current costs of things, materials
13 need to be used. So it's there. But if the workload
14 increases to a point where it justifies a head count
15 increase, then we would seriously look at that.

16 MS. RUSHING: Thank you. Just a couple
17 more questions on a subject that my co-counsel touched
18 on previously. The AoR is defined by geology, not
19 property boundaries; correct?

20 MR. WRINKLE: That is my understanding.
21 Yes.

22 MS. RUSHING: And the plume does not
23 stop at the edge of the applicant's leasehold, nor
24 does the pressure front; correct?

25 MR. WRINKLE: No. No. Physics doesn't

1 stop at political boundaries. No.

2 MS. RUSHING: So an area of review may
3 extend beneath lands that the applicant does not own
4 or lease?

5 MR. WRINKLE: So repeat that. I'm
6 sorry.

7 MS. RUSHING: May the area of review
8 extend beyond lands that the applicant owns or leases?
9 Could the area of review include lands that the
10 applicant has no legal right to?

11 MR. WRINKLE: I suppose. I -- I'm not
12 totally sure about that. I would have to review the
13 rule.

14 MS. RUSHING: Is there anything in the
15 proposed rules -- it sounds like no, but that requires
16 the applicant to hold any interest in all lands under
17 the area of review or above the area of review?

18 MR. WRINKLE: I -- I'm not sure.

19 MS. RUSHING: Okay. And corrective
20 action is sometimes required for these permit
21 applications; correct?

22 MR. WRINKLE: Yeah. They have to have
23 a corrective action plan.

24 MS. RUSHING: And that can require
25 reentering and re-plugging old wells?

1 MR. WRINKLE: Correct.

2 MS. RUSHING: Can that require physical
3 entry onto the surface location and into a wellbore?

4 MR. WRINKLE: Yeah. You would have to
5 do that. Yeah.

6 MS. RUSHING: Is there anything in the
7 proposed rules that gives a Class VI applicant a right
8 of entry to well on land owned by third parties?

9 MR. WRINKLE: I'm unsure of that. I
10 would have to review that unless I can punt.

11 MS. RUSHING: Is there anything in the
12 rules that you're aware of that would compel the owner
13 of that land to allow that work?

14 MR. WRINKLE: I'm not sure, but I think
15 one of our panel members has the answer to that.

16 MS. RUSHING: Okay.

17 DR. SCHNARR: My understanding of the
18 current structure would be that if they were not
19 able -- if the operator was not able to gain access to
20 perform corrective action, they would not be able to
21 receive the necessary permit.

22 MS. RUSHING: Okay. That's great.
23 Thank you. And we can assume that the same access
24 problem would apply to siting monitoring wells?

25 MR. WRINKLE: Yeah. Go ahead. Yeah.

1 DR. SCHNARR: There's some more
2 flexibility there. A well that's already in place, it
3 can't be moved. But generally, yes. If they can't
4 place a monitoring well in a place that the director
5 would require it, that would be a problem for gaining
6 the necessary permit.

7 MS. RUSHING: And for -- let me -- I
8 can skip that one. Okay. Is there a provision in the
9 proposed rules requiring an applicant to identify the
10 surface, mineral, and pore space owners within the
11 unit and within a half mile of its boundary?

12 MR. WRINKLE: Yeah. No, I don't
13 believe so. I -- I believe that that is covered in
14 AoR noticing. So if you're inside the AoR, you're
15 going to get a notice.

16 MS. RUSHING: I don't think so -- or --
17 can you go to the proposed Rule 19.15.41.8(e)? Sorry.

18 DR. SCHNARR: A what?

19 MS. RUSHING: 19.15.41.8(e) as in ear.

20 MR. WRINKLE: Well, let me rephrase
21 that. I -- that's in the permitting process that you
22 have to provide notice when you establish your AoR.

23 MS. RUSHING: In this provision,
24 19.15.41.8(e)(5)(a)(3), the proposed rules require
25 notice to a list of parties, including federal and

1 state agencies, persons on the mailing list, the
2 applicant, and other agencies from which the permits
3 will be required; correct?

4 MR. WRINKLE: I'm still getting there.

5 MS. RUSHING: Apologies.

6 MR. CHANG: For our benefit, could you
7 repeat that citation again as well?

8 MS. RUSHING: 19.15.41.8(e) as in ear,
9 5 -- oh, (5). Yeah. And then (a) as in apple.

10 MR. CHANG: Thank you.

11 MR. TREMAINE: We're on page 6 of OCD
12 Exhibit 1, the top third of the page.

13 BY MS. RUSHING:

14 MS. RUSHING: Does that list of parties
15 required to receive notice include surface landowners?

16 MR. WRINKLE: Yeah. It looks like it's
17 covered under (4), possibly.

18 MS. RUSHING: Can you read that
19 provision?

20 MR. WRINKLE: Yeah. "Persons on a
21 mailing list developed by, including those who request
22 in writing to be on the list. Soliciting persons for
23 area lists from participants in past periodic
24 publication or past permit proceedings in the area.
25 Notifying the public of the opportunity to be put on

1 the mailing list through periodic publications, press
2 and such publications as regional and state-funded
3 newsletters, environmental bulletins, or state law
4 journals. Director may update the mailing list from
5 time to time, requesting written indication and
6 continued interest from those listed. Director may
7 delete from the list. Any person who falls to respond
8 to such a request."

9 MS. RUSHING: So does that list
10 definitely include surface landowners?

11 MR. WRINKLE: No, not -- not verbatim,
12 specifically.

13 MS. RUSHING: And the law that
14 justifies this, 74.14(7), the sequestration
15 legislation that we talked about earlier in this
16 proceeding, notes that the surface owner may own the
17 pore space for sequestration; correct? Are you
18 familiar with that?

19 MR. WRINKLE: I'm not familiar with
20 that.

21 MS. RUSHING: Okay.

22 MR. WRINKLE: No.

23 MS. RUSHING: Apologies. Does the rule
24 require that notice must be given to persons who own
25 any subsurface minerals or pore space, including oil

1 and gas?

2 MR. WRINKLE: I don't believe it
3 specifically calls that out.

4 MS. RUSHING: Okay. Could allowing for
5 sequestration without notice to the surface owner
6 increase drilling costs or pose additional risks for
7 oil and gas development?

8 MR. WRINKLE: Rephrase that. If not
9 contacting the surface owner?

10 MS. RUSHING: Allowing for
11 sequestration without notice to the surface owner.
12 Could that increase costs or risks for development of
13 oil and gas under that pore space?

14 MR. WRINKLE: Yeah. Not -- not being
15 in industry development. I -- I couldn't answer that
16 question.

17 MS. RUSHING: Okay. Almost done. Do
18 the proposed rules require a finding that the project
19 will not contaminate producible oil, gas, or potash
20 absent the consent from these interest owners?

21 MR. WRINKLE: The proposed rule doesn't
22 specifically spell that out, I believe. But you have
23 the Oil and Gas Act, which -- which protects that.

24 MS. RUSHING: And finally, are you
25 familiar with unitization in oil and gas permitting?

1 MR. WRINKLE: At a very, very high
2 level.

3 MS. RUSHING: Are there any unitization
4 requirements in this proposed rule?

5 MR. WRINKLE: I do not believe so.

6 MS. RUSHING: Can the State Land Office
7 or Bureau of Land Management pore space be implicated
8 in injection under the rule as it stands today without
9 a unitization scheme?

10 MR. WRINKLE: I'm -- I'm not sure.

11 MR. TREMAINE: Object, legal

12 MR. WRINKLE: Sorry.

13 MS. RUSHING: Okay. All right. Final
14 question. In your opinion, are these rules
15 technically adequate to establish a complete
16 regulatory scheme?

17 MR. WRINKLE: I believe so. Yes.

18 MS. RUSHING: No further questions.

19 Thank you.

20 THE HEARING OFFICER: Thank you.

21 Mr. Pavlik on the platform.

22 MR. PAVLIK: Yes. Hello. Thank you.

23 Good afternoon. Most of my questions today, I think,
24 will be directed to Mr. Eales.

25 CROSS-EXAMINATION

1 BY MR. PAVLIK:

2 MR. PAVLIK: Good afternoon, Mr. Eales.
3 I'm going to start -- oh, sorry.

4 MR. EALES: No. Good afternoon.

5 MR. PAVLIK: Thank you. I'm going to
6 start by discussing some of the questions that
7 Dr. Wang and Dr. Khaniani have referred me to you for.
8 And then I'd also like to go over some of the
9 emergency response procedures.

10 So starting with those initial
11 questions, can a depleted oil and gas field or
12 reservoir serve as a confining zone for permanent
13 storage of CO₂?

14 MR. EALES: A depleted oil and gas
15 reservoir could meet the requirements if it -- if it
16 does meet the requirements of the rule. Yes.

17 MR. PAVLIK: And all other things
18 equal, is a depleted oil and gas reservoir a preferred
19 location to site a Class VI injection well as compared
20 with other locations without legacy wells present?

21 MR. EALES: To the point that you're
22 making, that a depleted well and gas field would have
23 several -- several points that -- of wells that are in
24 that same zone from historic operations. So it's not
25 preferable.

1 In order to meet the standard, the
2 operator would have to plug those wells to be able to
3 prove the containment zone that's required by the
4 Class VI.

5 So to your point, a injection zone that
6 is more of a -- a greenfield area with less intrusions
7 would be more preferable than one that had been used
8 for production for several years.

9 MR. PAVLIK: Thank you. And is -- am I
10 understanding correctly that the reason for that would
11 be the presence of these legacy oil and gas wells that
12 may or may not perforate the injection zone?

13 MR. EALES: Yeah, that's correct. And
14 in 19.43, as part of your permit application, you have
15 to submit all known intrusions into the injection
16 zone. Therefore, depleted oil and gas production
17 reservoir would've had several of those intrusions.
18 And -- and part of the requirements in the rule is you
19 have to identify them and then identify the means of
20 plugging them with the appropriate metallurgical plugs
21 and cement.

22 So yeah, that's where it would be less
23 likely to be using one of those versus a field that
24 had not seen oil and gas production.

25 MR. PAVLIK: Thank you. And kind of

1 speaking to that, is it necessary to then identify all
2 inactive or abandoned wells that either enter that
3 injection zone or a geologically connected zone to
4 that CO2 storage reservoir?

5 MR. EALES: Absolutely. Yeah,
6 absolutely. The -- there's a requirement as part of
7 the permitting process to, number one, understand your
8 AoR. And it creates the -- the potential of the plume
9 over the maximum permitted volume over an X period of
10 years, and to assess any possible intrusion, and then
11 plug those wells.

12 So again, you're able to have a very
13 clear injection zone and a very clear confinement
14 layer to ensure that the injected CO2 stays within
15 that confinement layer.

16 MR. PAVLIK: Okay. And would you say
17 that it is important to ensure that every one of those
18 wells are identified?

19 MR. EALES: Yes.

20 MR. PAVLIK: And in order to mitigate
21 this potential increased risk of leakage in such a
22 legacy oil and gas field, is it also necessary to
23 ensure the mechanical integrity of all inactive or
24 abandoned wells that may pass through or are near that
25 injection zone or geologically connected formation?

1 MR. EALES: Yes. You would have to
2 ensure, and -- and that's actually in 19.15.43, what
3 we're -- we're talking about, that you would have a
4 corrective action for plugging -- number one,
5 performing an MIT. If an MIT showed that those wells
6 had integrity and were not at risk of communicating
7 outside of the confinement zone, that would be
8 something that would be observed over a period of time
9 more cautiously.

10 But if there was any concern of any
11 loss of integrity in which, again, you lose the
12 confinement zone, then you would certainly have to
13 plug that well.

14 MR. PAVLIK: Okay. And are these risks
15 that we're discussing regarding well perforations, are
16 these limited only to perforations by inactive and
17 abandoned wells, or do they extend to perforations by
18 active oil and gas wells?

19 MR. EALES: Again, if it's depleted --
20 what I would say is it would apply to both. But if
21 it's a depleted reservoir, there would not be active
22 oil and gas wells in that reservoir. Or I
23 misunderstand your question. Maybe if you could
24 clarify it?

25 MR. PAVLIK: No, that's helpful. I

1 think -- yeah, maybe if we turn to an active
2 reservoir, would an active oil or gas reservoir be a
3 suitable location for injection -- long-term injection
4 of CO2 via Class VI well?

5 MR. EALES: No. The point that I was
6 making earlier, the requirement for a confinement
7 layer, confinement zone, would not be part of that.
8 As you pointed out earlier in your earlier question,
9 if it was an active producing zone, there would be gas
10 or oil coming to the surface from that sequestration,
11 which negates the word sequestration. That would be
12 a -- a completely different use.

13 So no, it would not function. The --
14 the only way that it would work again is if you stop
15 the oil and gas production and, again, plugged all
16 wells. And that would run counter to the Oil and Gas
17 Act of not wasting resources. If -- if you had known
18 resources in that zone, you would not want to
19 sequester. Or the Oil and Gas Act would not allow
20 sequestration if there was known resources that could
21 be brought up to surface.

22 MR. PAVLIK: And so if I'm
23 understanding correctly, any proposed Class VI well
24 that would be injecting into an active oil or gas
25 field, that would not pass site characterization

1 necessary requirements. Is that correct?

2 MR. EALES: That's correct. It would
3 be bringing -- again, it would be not meeting the
4 requirement of a confinement zone.

5 MR. PAVLIK: Okay. So this being the
6 case, siting the Class VI well within a producing oil
7 or gas field or connected geologic structure would be
8 an exception, or it might not happen at all. Is that
9 correct?

10 MR. EALES: That's correct. Again, the
11 Oil and Gas Act would dictate that, that it's a known
12 resource and you would not be able to keep a known
13 resource in a reservoir that could be brought to
14 surface, and the act of sequestering and plugging
15 would -- would run counter.

16 MR. PAVLIK: And so -- excuse me. If
17 I -- and just in summary, what I'm understanding is
18 that it is unlikely that a Class VI injection program
19 that's properly administered would have any effect on
20 active oil or gas production. Is that correct?

21 MR. EALES: That's correct.

22 MR. PAVLIK: Okay. Let's turn to the
23 emergency response procedures, please. Do you happen
24 to have a copy of your rebuttal testimony with you?

25 MR. EALES: I do.

1 MR. PAVLIK: Where -- and let's see
2 here. I am looking at page 6 of your rebuttal
3 testimony, which is OCD Exhibit 25.

4 MR. EALES: Okay. Could you just go
5 ahead and read it while I find it?

6 MR. PAVLIK: Yeah, sure. I'm happy to.

7 MR. EALES: I'll be ready.

8 MR. PAVLIK: Okay. So the question is,
9 "CBD proposed the changes to emergency and remedial
10 response, including temporarily ceasing injections and
11 training for local emergency responders." What is
12 your response? Your answer to that --

13 MR. EALES: No, go ahead.

14 MR. PAVLIK: Your answer to that
15 question is, "The specific training requirements added
16 to the regulation are too prescriptive, especially for
17 the emergency response teams at the state, county, and
18 city level. These entities have robust training
19 requirements, which include multi-scenario response in
20 their areas. The proposed Class VI regulations for an
21 emergency response plan is sufficiently robust and
22 allows area emergency responders to build upon the
23 initial requirements in the manner that they feel
24 meets their local conditions." Does that --

25 MR. EALES: That's correct.

1 MR. PAVLIK: Does that sound correct?
2 Okay.

3 MR. EALES: That's correct. What I can
4 add to that is, and -- and I referred to it in an
5 earlier response to an earlier question, is the
6 emergency and remedial response section of the draft
7 rule is under 19.15.43(o), emergency and remedial
8 response.

9 And within that, the owner-operator, as
10 part of the permit application, number one, must
11 provide an emergency response plan, which has to
12 include an outreach. So that outreach has to be done
13 before the actual submittal of the application. And
14 then that plan must show that the operator provides
15 training for local emergency responders, including
16 summary of outreach activities.

17 So it may be a semantics point, but
18 what we found in the outreach sessions across the
19 state in which we purposely invited county
20 commissioners and emergency response groups is they
21 didn't want us to feel that we should be too
22 prescriptive on how they managed their scuba response
23 gear or their trucks.

24 It was -- they were very happy to be
25 told through the outreach of the specific risks of

1 C02. But I think that's where I was responding to
2 on -- on my rebuttal that we didn't want to go too far
3 with it and begin becoming too prescriptive. I don't
4 know if that's helpful or not, though.

5 MR. PAVLIK: So that is helpful.

6 MR. EALES: So it is required in the
7 rule. But maybe I'm -- I'm thinking that the request
8 was a little further than I thought it was.

9 MR. PAVLIK: Sure. Yeah. Your answer
10 notes that, "Especially for the emergency response
11 teams at the state, county, and city level," this is
12 unnecessary because those entities, "already have
13 robust training requirements, which include multi-
14 scenario response in their areas."

15 Does OCD have a copy of, or is OCD
16 otherwise aware of the training requirements for each
17 state, county, and city emergency response team in New
18 Mexico?

19 MR. EALES: So my answer to that, I'm
20 not aware of OCD having a copy of each county's or
21 city's response mechanism. And I think that speaks to
22 what I was saying earlier. Some counties are
23 volunteer. Some are paid. They have different means
24 of responding.

25 And, again, when we did outreach and

1 talked about the threats, they were glad to understand
2 that. But each county, city, and each entity we spoke
3 to had a different way that they felt met the
4 emergency response requirements within their
5 particular roles.

6 MR. PAVLIK: And just briefly, do you
7 in fact know that each state, county, or city response
8 team in New Mexico with a, "multi-scenario response,"
9 has included the scenario of a catastrophic carbon
10 dioxide release as one of those multiple training
11 scenarios?

12 MR. EALES: I'm not aware of that,
13 unless they are aware of CO2. Some outreach that we
14 performed, they were used to CO2 in their area and
15 were aware of it. So others that just may be new
16 would have to incorporate that.

17 MR. PAVLIK: And in the likelihood that
18 a state, county, or city response team may not have
19 prepared for this type of scenario, is that higher
20 considering the relatively new nature of the Class VI
21 program in New Mexico?

22 MR. EALES: Yeah. In general, that's
23 the purpose of the section I referred to earlier, that
24 19.15.43(o), that an operator must have submitted and
25 received approval from OCD that they did reach out to

1 the area of emergency responders about a plan to apply
2 and, you know, what -- what they were -- I guess, what
3 their emergency response plan would look like and get
4 feedback from not only emergency responders, but the
5 community itself.

6 MR. PAVLIK: Thank you. How many Class
7 VI injection wells are currently fully permitted and
8 operational in New Mexico?

9 MR. EALES: I'm not aware of one.

10 MR. PAVLIK: And how many Class VI
11 wells are currently making their way through the
12 permitting process in New Mexico?

13 MR. EALES: I'm only aware of one going
14 through the process.

15 MR. PAVLIK: Does the fact that there
16 is not one operational Class VI well in New Mexico
17 affect the likelihood that state, county, or city
18 response teams in the state have prepared a response
19 to catastrophic release of CO2 from a Class VI well?

20 MR. EALES: I don't think so. And
21 again, I go back to my earlier answer that the state
22 of New Mexico is in a great position in that CO2 has
23 been commonly used throughout the state for EOR
24 activities. So there's pipelines. In fact, we met
25 with the Pipeline Safety Bureau Chief Jason Montoya,

1 who is very familiar with the transport of CO₂, not
2 the injection.

3 But the state itself has got a very
4 great awareness of how to manage CO₂. Again,
5 primarily because of the use of EOR and the -- the
6 transport of CO₂, specifically from the northern edge
7 of New Mexico to the southeast corner.

8 MR. PAVLIK: And just to confirm, when
9 you say, "the state," are you referring to OCD or are
10 you referring to all of the communities in New Mexico?

11 MR. EALES: Yeah, that's a good
12 question. What I'm referring to are the communities
13 in which the -- they have seen CO₂ commonly used. So
14 not all of New Mexico, but I'd say there's a --
15 there's a very -- it was actually a very pleasant
16 surprise. Most of the state in our outreach session
17 was -- was aware of the risk and -- and how they had
18 incorporated it.

19 But to your earlier point, there would
20 be some areas where it would be new and that's the
21 requirement for the emergency response plan planning.

22 MR. PAVLIK: Thank you. And would you
23 agree that having a robust response in place would be
24 necessary to adequately respond to Class VI emergency?

25 MR. EALES: I think it's a -- a great

1 way to be proactive and yes, to have a planned
2 response to that or any other emergency. It's always
3 good to plan ahead.

4 MR. PAVLIK: Just to be clear, would it
5 be necessary to plan ahead to respond to a Class VI
6 emergency, or would it just be helpful?

7 MR. EALES: I think both. Just depends
8 on your -- your definition of necessary. But I would
9 say you should always have a proactive emergency
10 response plan in all cases, even a family fire plan
11 just in case.

12 So I see it as a very good idea. And
13 you could say the word necessary, but it just depends
14 upon the definition of the word, I guess.

15 MR. PAVLIK: If emergency community
16 responders are already undertaking this sort of
17 training, could a Class VI project applicant include a
18 statement to this effect in its emergency and remedial
19 response plan required by the proposed rule in the
20 section you've noted, 19.15.43.9(o)(2)?

21 MR. EALES: Yeah. I think that the
22 requirement for an emergency response plan is spelled
23 out, to your point in 19.15.43(o)(2), the last
24 sentence, that the operator has to have that emergency
25 response plan as part of their application. And prior

1 to that plan being built or added or important to the
2 plan is early community outreach to build the plan and
3 inform the plan.

4 And then I would also add that that
5 section (o) also has a requirement to review and
6 update that plan every three years or more frequently
7 if things change.

8 MR. PAVLIK: Okay. And would an
9 adequate response training benefit communities that
10 may not already be undertaking this training?

11 MR. EALES: Yes. And I believe that
12 the training that's required within the standard
13 allows OCD to go to the extent of their -- what their
14 purview is insofar as making the communities aware of
15 CO2, and the risks of injecting CO2, without
16 overstepping the bounds of the authorities of the
17 sheriff, deputy, or counter responders.

18 MR. PAVLIK: Thank you. And going just
19 briefly back to the ability for a community to provide
20 a statement that it is already undertaking such
21 training as part of an emergency response plan
22 submitted to OCD, would this approach allow OCD to
23 determine minimum training requirements to protect
24 communities without requiring response teams to repeat
25 training they are already undertaking?

1 MR. EALES: Yes. In fact, we've --
2 we've -- in the outreach we've done as part of the
3 creation of the rule, we had a standardized approach
4 that we rolled to the communities. And the verbiage
5 within this section, section (o), again, has a lot of
6 specific words that spell out that the outreach must
7 identify chain of command, develop protocols for
8 notifying the public.

9 There's a lot of specificity within
10 that section that I believe provides very good
11 protection for the community. And again, the
12 community has to agree with that throughout the
13 outreach sessions.

14 MR. PAVLIK: So do you believe that the
15 current rule already prescribes minimum requirements
16 for a training program?

17 MR. EALES: Yes, I do.

18 MR. PAVLIK: Can you please read those
19 requirements?

20 MR. EALES: Yeah. "So the owner or
21 operator must conduct outreach" -- or I'll start off
22 at the beginning. "As part of the permit application,
23 number one, owner or operator must provide the
24 director with an emergency remedial response plan that
25 describes the actions the owner-operator will take to

1 address movement of the injection or formation
2 fluids" -- "fluids that may cause endangerment to USDW
3 during construction, operation, and post-injection.
4 The requirement to maintain a plan is directly
5 enforceable, regardless of whether the requirement is
6 a condition of the permit."

7 MR. PAVLIK: Okay. Sorry, briefly
8 can --

9 MR. EALES: Second section --

10 MR. PAVLIK: Sorry to interrupt. Just
11 briefly, did that section you just read outline any
12 minimum training requirements?

13 MR. EALES: Oh, no, that one did not.

14 MR. PAVLIK: Okay. Thank you.

15 MR. EALES: But the next section does.

16 So I -- I wanted to kind of highlight the front end.

17 So "The owner-operator must conduct outreach with
18 communities during the development of the plan.

19 Outreach must identify the chain of command for
20 notifying the public in the event of an emergency and
21 incorporate this information in the plan, and to
22 develop protocols for notifying the public about well-
23 related issues and emergencies, taking into account
24 local language needs and needs of persons with
25 disabilities. It must describe how the operator will

1 provide training for local emergency responders,
2 include a summary of community outreach activities,
3 and explain how the outreach will be maintained."

4 And so then it goes on to say, if -- it
5 has to have "If there is evidence of a stream causing
6 endangerment, operator must immediately cease
7 injection, take all steps necessary to identify and
8 characterize, notify the director."

9 MR. PAVLIK: Sorry. Can I -- sorry to
10 interrupt again.

11 MR. EALES: No, it's okay.

12 MR. PAVLIK: Yeah. So I think starting
13 on subsection 3 there, that shifts into the required
14 response by an operator to an emergency. Is that
15 correct?

16 MR. EALES: That's correct.

17 MR. PAVLIK: Okay. And so really
18 focusing on subsection 2, which I think you've
19 identified as the minimum training requirements, can
20 you please highlight again what the actual
21 requirements for training are that community members
22 must receive?

23 MR. EALES: Yeah. So "Chain of command
24 for notifying the public in the event of an emergency.
25 Protocols developed for notifying the public about

1 well-related issues and emergencies, taking into
2 account local language needs and needs of persons with
3 disabilities."

4 And then it goes on to say, "The
5 operator must provide training for emergency
6 responders, community outreach activities conducted,"
7 and then how you do that throughout the life of the
8 project.

9 MR. PAVLIK: Thank you. Does that
10 section that you've read -- it does require the
11 operator to supply training, but does it outline what
12 that training must include?

13 MR. EALES: No, it -- it does not get
14 into more specific detail. Like a number of things
15 you can think of, but it allows that to be a variable.
16 I guess what I would say is, dependent upon the actual
17 project and activity, it allows openness as to what
18 specifically needs to be covered when you say well-
19 related issues and emergencies.

20 The operator would have the onus of
21 ensuring that "well-related issues" are clarified and
22 made -- and made clear to the community and
23 responders. So in this case, a well-related issue
24 would have to include that you're injecting CO2. But
25 beyond that, it's not more prescriptive. No.

1 MR. PAVLIK: Do you think it would be
2 helpful for the Oil Conservation Division with its
3 expertise to supply certain minimum requirements for
4 training?

5 MR. EALES: I think that that's a -- a
6 good idea and like the idea. It may be something that
7 could be done in the form of guidance or something
8 that would not be constrained during the passage of
9 time. It may be something that gets improved and --
10 and we could provide a emergency response guidance
11 from the state, or incorporate it in the rule.

12 MR. PAVLIK: Thank you. Turning just
13 briefly to the third and final sentence of your
14 answer, you note, "The proposed Class VI regulations
15 for an emergency response plan is sufficiently robust
16 and allows for area emergency responders to build upon
17 the initial requirements in a manner that they feel
18 meets their local conditions."

19 Can you please explain what you mean by
20 "the initial requirements"?

21 MR. EALES: So what I mean is, again,
22 referring to the experience we had in working with
23 actual emergency response groups in New Mexico,
24 initial requirements are -- I -- I guess the word
25 "initial," I would say in my response, I was maybe too

1 specific. And I would just say response in general
2 should be something that OCD brings its expertise as
3 far as the awareness, to your point earlier, of the
4 well and the risks of the well. But the emergency
5 responders themselves have their own way of addressing
6 things that changes all the time.

7 And, again, that was the number one
8 feedback from the outreach, was that each one of the
9 groups did not want OCD to, you know, dictate how they
10 respond to emergencies because they had the plans in
11 place. They just wanted awareness of -- of the risk.

12 MR. PAVLIK: Thank you. And just I
13 think my final question is you note that this language
14 allows, and the proposed rule allows, emergency
15 responders to "build on", any of the requirements.

16 In the section that you read,
17 subsection 2, I heard that the operator must describe
18 its outreach and outline the steps it's taken in this
19 outreach and training. But I did not note any
20 language that required the operator to take into
21 account local needs or gave local emergency responders
22 the ability to add to the training plan.

23 Is there a specific provision that you
24 were referring to when you noted that the local
25 community responders may build on these requirements?

1 MR. EALES: No, it is not specified
2 within the rule. And, again, seems simply because of
3 the problems with being prescriptive towards making
4 commitments for other emergency response entities that
5 OCD has no authority over.

6 So it does spell out that the operator
7 needs to identify the well-related issues and
8 emergencies, which OCD has the ability to determine if
9 that was sufficient and what's with -- submitted
10 within the plan is sufficient or needs to be added
11 upon, and have the ability to approve or disprove
12 based upon their review.

13 MR. PAVLIK: And just in summary,
14 articulating specific minimum training requirements
15 for community engagement would be too prescriptive.
16 Is that correct?

17 MR. EALES: Yes. In my opinion.

18 MR. PAVLIK: And that would be -- I'm
19 sorry. Go ahead.

20 MR. EALES: Yeah. I just say yes, in
21 my opinion.

22 MR. PAVLIK: Thank you. That's all I
23 have. I appreciate your time.

24 MR. EALES: Thank you.

25 MR. PAVLIK: Thank you.

1 THE HEARING OFFICER: Thank you,
2 Mr. Pavlik.

3 Ms. Ruscavage-Barz? Do you have
4 questions?

5 MS. RUSCAVAGE-BARZ: Yes. Thank you,
6 Madam Hearing Examiner. All of my questions are for
7 Mr. Wrinkle.

8 CROSS-EXAMINATION

9 BY MS. RUSCAVAGE-BARZ:

10 MS. RUSCAVAGE-BARZ: Good afternoon,
11 Mr. Wrinkle. I'm Samantha Ruscavage-Barz, counsel for
12 WildEarth Guardians. And I have some questions for
13 you specifically related to your testimony regarding
14 OCD's capacity to implement, manage, and oversee the
15 Class VI program. And for most of my questions, I'll
16 be referring to your direct testimony, which is in as
17 Exhibit 4.

18 MR. WRINKLE: Okay.

19 MS. RUSCAVAGE-BARZ: Do you have that?

20 MR. WRINKLE: I -- I have it right
21 here.

22 MS. RUSCAVAGE-BARZ: Okay. So just
23 starting with staffing and technical expertise, on
24 page 4 of your testimony, you say, "Once New Mexico
25 receives primacy, the state will assume responsibility

1 for permitting compliance and enforcement of all Class
2 VI wells."

3 And then earlier, this is in your
4 direct testimony, but you also responded to Ms.
5 Rushing's questions, and there will be three full-time
6 people in the program.

7 MR. WRINKLE: That -- that's correct.
8 Yes.

9 MS. RUSCAVAGE-BARZ: A supervisor and
10 two employees?

11 MR. WRINKLE: That's correct. Though
12 that are specifically for the Class VI program.

13 MS. RUSCAVAGE-BARZ: And for the
14 supervisor, on page 5 of your testimony, you said that
15 the supervisor has expertise as a geoscientist and
16 operations leader; correct?

17 MR. WRINKLE: I believe so. On page 5?

18 MS. RUSCAVAGE-BARZ: Yes.

19 MR. WRINKLE: I don't believe I -- I
20 did that there. I think I did it somewhere else.
21 Let's see.

22 Yeah. On page 5, it just talks about
23 what kind of technical expertise is needed. And then
24 there was another portion where I talked directly
25 about the actual people that are staffed.

1 MS. RUSCAVAGE-BARZ: I'm referring to
2 the top of page 5 where you say the team is currently
3 led by a project manager.

4 MR. WRINKLE: Oh, okay. Yeah. You're
5 right. I'm sorry about that.

6 MS. RUSCAVAGE-BARZ: Okay.

7 MR. WRINKLE: Yes, that is correct.
8 And he's also a project management professional and
9 certified geoscientist with a lot of operations
10 experience.

11 MS. RUSCAVAGE-BARZ: Okay. So if New
12 Mexico receives primacy, will that supervisor be
13 reviewing and processing Class VI permits?

14 MR. WRINKLE: Yeah. Yes. So he -- he
15 would be basically a working alongside supervisor. So
16 you have your two technical, and then he would also
17 assist in and divvy -- divvy up the duties within that
18 team.

19 MS. RUSCAVAGE-BARZ: So would he also
20 be conducting onsite well inspections?

21 MR. WRINKLE: No. No. That -- like I
22 was -- answered earlier, that's going to fall into
23 our -- our, what I like to call, boots on the ground
24 people that are in the field doing the onsite
25 inspections.

1 MS. RUSCAVAGE-BARZ: Would the
2 supervisor also be ensuring ongoing compliance with
3 permit requirements?

4 MR. WRINKLE: Yes. He would -- he
5 would be responsible for it himself, or he would
6 assign that to the team members.

7 MS. RUSCAVAGE-BARZ: What role would
8 the supervisor have in enforcing permit requirements?

9 MR. WRINKLE: So, you know, there's --
10 there's always major and minor. You're talking post-
11 injection?

12 MS. RUSCAVAGE-BARZ: Yes.

13 MR. WRINKLE: Yeah. Okay. So when
14 monitoring, you know, begins and we -- there --
15 there's already things outlined in the role of, you
16 know, thing -- triggers, things that you have to shut
17 in for, et cetera.

18 There would be probably audits that --
19 that on go for, you know, checking on that monitoring
20 to see if they are in line with their permit
21 requirements. If they are not, then it would go the
22 normal process, which -- that we do in the Engineering
23 Bureau, which is -- it basically escalates. So it
24 would escalate to me, then to my deputy director, up
25 to our director, and we would place severity on that.

1 And in my experience, what I have
2 passed up that has been severe, you know, it gets
3 immediate attention.

4 MS. RUSCAVAGE-BARZ: And would the
5 other members of the team then also be reviewing and
6 processing Class VI permits?

7 MR. WRINKLE: Yes. The other two team
8 members. Correct.

9 MS. RUSCAVAGE-BARZ: And they would not
10 conduct onsite well inspections. Is that correct?

11 MR. WRINKLE: No. Extremely rarely
12 would they be in the field. These are -- these are
13 desk -- desktop side employees.

14 MS. RUSCAVAGE-BARZ: But they would
15 also have responsibility for ensuring ongoing
16 compliance with permit requirements and some
17 enforcement?

18 MR. WRINKLE: Correct. Basically by
19 auditing, reporting. Something that, you know, you
20 can historically view that you can't really onsite.
21 So onsite is more for, like, mechanical integrity
22 tests, you know, observational at the wellhead level.

23 But it's just as important when
24 you're -- when you're doing a -- a desk side audit;
25 right? You're looking at the reporting and then

1 you're making sure that they do fall in line with
2 those permit requirements.

3 MS. RUSCAVAGE-BARZ: Thank you. And
4 according to page 5 of your written testimony, in
5 answering the question, "What types of technical
6 expertise will support implementation of the proposed
7 Class VI program?" you had listed several technical
8 professionals. And so I'd like to go through that
9 list now with some questions.

10 MR. WRINKLE: Sure.

11 MS. RUSCAVAGE-BARZ: So you first state
12 that "OCD will rely on geologists for assessment of
13 the applicant's site characterization, confining zone
14 integrity, fault analysis, proposed monitoring
15 programs, and long-term CO2 containment modeling";
16 correct?

17 MR. WRINKLE: Correct.

18 MS. RUSCAVAGE-BARZ: Are those
19 geologists currently on OCD staff?

20 MR. WRINKLE: Yeah. Well, the -- the
21 supervisor is a geoscientist. We -- we also have, in
22 peripheral, other groups that are in engineering.
23 We -- we have, just off the top of my head, I think
24 four geologists. And most of these geologists are,
25 you know, specialized in their area. Of course,

1 because, as we all know, New Mexico has very unique
2 geology.

3 So we would rely, you know, on things
4 that -- that maybe seem out of the purview of the
5 assigned geologists. We would -- we would bring in,
6 you know, those internal people to consult with and
7 those type of things is what I was trying to get at
8 there.

9 MS. RUSCAVAGE-BARZ: Which departments
10 or sections are the geologists in?

11 MR. WRINKLE: So there -- there's a --
12 a UIC section, which is one through five; right?
13 There is a -- what I like to call the hydrocarbon
14 permitting section, which is all of the APD reviews,
15 you know, sundries of that nature for any type of
16 hydrocarbon.

17 There's, I believe, two to three
18 geologists in that group. And then there is one
19 geologist that is sitting in what I call, or what the
20 OCD calls, the special projects group that is over the
21 operational needs of our Orphan Well Program.

22 So right now, currently sitting at the
23 OCD, there -- there is a lot of -- of geology talent
24 that we can pull from.

25 MS. RUSCAVAGE-BARZ: You also state

1 that OCD will rely on engineers for well construction
2 design, mechanical integrity evaluation, pressure
3 testing, corrosion monitoring, and review of injection
4 operations; correct?

5 MR. WRINKLE: That -- correct. Yes.

6 MS. RUSCAVAGE-BARZ: Are those
7 engineers currently on OCD staff?

8 MR. WRINKLE: Yeah. So the -- the two
9 technical jobs, the petroleum specialists that are
10 specifically for the -- the Class VI program, are
11 petroleum engineers. But that is one thing that we're
12 not lacking at the OCD is petroleum engineers. We --
13 we have a lot of those in -- that are spread out
14 amongst all the groups in engineering, that if -- if
15 you added up the experience, it would be in the -- the
16 hundreds of years. So that -- that is one area
17 that -- that we're pretty -- pretty well staffed in.

18 MS. RUSCAVAGE-BARZ: Approximately how
19 many engineers?

20 MR. WRINKLE: I would say approximately
21 12 to 15 total.

22 MS. RUSCAVAGE-BARZ: You also state
23 that "OCD will rely on regulatory and compliance
24 professionals for managing the permitting process,
25 ensuring compliance with UIC requirements, review of

1 monitoring reports, and enforcing corrective action
2 and emergency response obligations"; correct?

3 MR. WRINKLE: Correct.

4 MS. RUSCAVAGE-BARZ: And are those
5 regulatory and compliance professionals currently on
6 OCD's staff?

7 MR. WRINKLE: Yeah. Yeah. So that --
8 we're -- we wear many hats. And I would say that --
9 that a lot of the -- those duties would fall upon the
10 petroleum specialist and the supervisor in that group.
11 But then they could reach out to people like me for
12 regulatory needs, interpretation.

13 The other supervisors that report to
14 me, the UIC supervisor, the permitting supervisor, as
15 the regulatory professionals. And there's also, in
16 our UIC side, you know, an -- an auditing individual
17 that -- that has a lot of experience that we could
18 rely on.

19 But when -- when you work in a
20 regulatory body, like -- like we do, the regulatory
21 specialist kind of goes hand in hand with that --
22 whatever you do because you're working in that
23 context. So I did list it out as kind of a -- a -- an
24 entity of its own, but it -- it is kind of, you know,
25 a multiple hat type scenario.

1 MS. RUSCAVAGE-BARZ: Okay. You state
2 that "OCD will rely on field inspectors for conducting
3 onsite inspections, verifying well construction and
4 operational standards, monitoring field conditions,
5 and ensuring safe injection and monitoring
6 activities."

7 And you previously answered in response
8 to Ms. Rushing's question that OCD currently has
9 approximately 18 inspectors. Is that correct?

10 MR. WRINKLE: Yeah, approximately.

11 MS. RUSCAVAGE-BARZ: Are the inspectors
12 responsible for field inspection across all OCD
13 programs where field inspections are a requirement?

14 MR. WRINKLE: Yeah. So right now,
15 especially in the -- the southern part of the state,
16 we actually have two -- I believe two inspectors right
17 now that are -- we -- we call them our UIC inspectors.
18 And what they do most of their day now in between, you
19 know, there's a lot of windshield time there, they'll
20 go and do normal site inspections, just routine
21 things.

22 And -- and we have a fairly powerful
23 GIS system that shows dots that are near them. Hey,
24 this well hasn't had an inspection in X amount of
25 time. So they'll go and grab that while they're in

1 between those -- those duties. So we're trying to get
2 a lot of efficiencies through technology there.

3 But what we're -- what we're planning
4 on doing is -- is doing the same thing with a -- with
5 a couple more inspectors that would be Class VI, that
6 would time write basically, you know, their -- their
7 time on the Class VI well.

8 So that's going to be, you know,
9 sitting on the operation while the well is being
10 constructed, making sure that the cement, that the --
11 that the well construction design is performed as set
12 in the permit. And then especially post-injection,
13 you know, going out and doing the required MITs that
14 are laid out in the permit, that -- all the other
15 required witness testing.

16 Now, if that does become, you know, a
17 burden, an overloaded burden, to -- and it takes away,
18 right, from other duties that they are doing, then the
19 OCD would definitely look at, you know, making them,
20 you know, a -- a specific job role rather than wearing
21 multiple hats; right?

22 But for the forecast that we have for
23 the Class VI wells, we -- we believe that that's
24 doable now. But, you know, if it doesn't -- if it's
25 not in the future, then we definitely will take a -- a

1 hard look at that and see if we need to pivot from
2 that model.

3 MS. RUSCAVAGE-BARZ: When would you be
4 looking to hire the two Class VI field inspectors?

5 MR. WRINKLE: Well, it would -- it
6 would only be if -- if the workload justified it. So
7 these two Class VI inspectors are already there. We
8 just haven't picked them yet; right? They would be
9 specifically for Class VI, receive the proper training
10 for, you know -- because there's different ways that a
11 Class VI well that you have to watch for when you're
12 doing MITs because of fluid and -- and all kinds of
13 fun physics stuff; right?

14 But we would only consider hiring
15 specifically for Class VI if that workload got too
16 much for the existing ones that we're basically asking
17 to wear multiple hats.

18 MS. RUSCAVAGE-BARZ: For the two
19 inspectors that you said you had down in Southern New
20 Mexico, approximately how many wells do they expect --
21 do they inspect on whatever basis makes sense to you,
22 daily, weekly, monthly?

23 MR. WRINKLE: Sure. So right now --
24 now, that's -- this isn't including the -- the two UIC
25 because they -- they do MITs all day long; right? So

1 they'll go and meet an operator on site. They'll --
2 they'll witness a mechanical integrity test, mostly on
3 injection wells for EOR and SWDs.

4 So taking those two out of the
5 equation, you have a population of seven to eight. We
6 are continuously doing 700 to 900 inspections a week.
7 And then we -- we recently, which, you know, I'm very
8 proud of, developed an efficiency digitally called a
9 pre-enforcement notification. So I track those as
10 well, or I should say the OCD tracks those, but I'm
11 responsible for pulling those numbers.

12 We consistently do 150 to 200 pre-
13 enforcement notifications that are anywhere from,
14 "Hey, your sign doesn't have the correct legal
15 location on it," to -- to "You're" -- "you're
16 injecting over your injection threshold"; right?

17 So, you know, of course, each one --
18 there's a spectrum; right? So the more severe --
19 severe ones, you know, they got to way -- make their
20 way up the chain. But -- but basically what -- what
21 that does is it automatically sends a notification
22 electronically to the operator and also puts that pre-
23 enforcement notification into the well file for public
24 view.

25 And sorry, I went -- I -- I elaborated

1 on that, but I'm just kind of proud of that. But so
2 to answer your question, seven to nine hundred
3 inspections a week, and then one hundred and fifty to
4 two hundred pre-enforcement notifications a week.

5 MS. RUSCAVAGE-BARZ: Thank you. I
6 appreciate the detail. Lastly, in that section, you
7 state that "OCD will rely on specialized technical
8 contractors for supplemental expertise for highly
9 technical evaluations, such as geologic modeling,
10 seismic monitoring, risk assessment, and long-term CO2
11 plume analysis"; correct?

12 MR. WRINKLE: That is correct. Yes.

13 MS. RUSCAVAGE-BARZ: Who at OCD, and by
14 that, I mean, which position, makes the decision that
15 the services of specialized technical contractors are
16 needed to support the Class VI program?

17 MR. WRINKLE: Well, it -- it would be
18 a -- a group decision. Yeah. So basically, you know,
19 the supervisor and team would -- would say, "Hey, you
20 know, we don't have this the expertise" or would like
21 better expertise in this situation outside of the OCD
22 to -- to me, basically. And then I would gather other
23 decision makers, and then we would make that decision.

24 Now, one decision that we've already
25 made in the -- you know, the infancy of building out

1 this permitting process is to model what the EPA
2 currently does where, you know, they contract, I
3 believe, with the National Labs, and he's nodding his
4 head, so he would know, to vet the models. And that
5 is something that we will have to enter an MOU or MOA
6 in with, like, the good doctors from New Mexico Tech
7 or, you know, some other entity to be able to vet
8 those inputs of those models and see if they match;
9 right? If the -- if the pressure front and the --
10 and -- and the plume are anywhere close, or if they
11 believe that the inputs of that model were
12 scientifically valid. So that's -- that's there.

13 We're also a member of the Groundwater
14 Protection Counsel, which is a -- a great organization
15 that gathers all of the current experts in -- in the
16 Class VI field. And they -- they are really, you
17 know, participating in a lot of those training modules
18 there.

19 Those people publish papers all the
20 time, and -- and they have guidances on permitting
21 along with the EPA. So we have a plethora of
22 information that will help guide us on where we
23 probably need the external help from, rather than
24 trying to do it internally.

25 And that's not -- not a problem at all.

1 I would rather have, and I think the -- the OCD as a
2 whole agrees with me, is, you know, where we need it,
3 get the right people looking at it and vetting it.

4 MS. RUSCAVAGE-BARZ: At what point in
5 the permit review process would the decision be made
6 that contractors were needed?

7 MR. WRINKLE: So for right now, the --
8 the pressure front and permit, we've decided that's
9 going to be needed. We're just -- we're just going to
10 do that. There's a high possibility -- and -- and
11 again, I'm sorry we're -- we're kind of building our
12 way through this right now, but I -- I believe, you
13 know, the -- the seismic risk stuff will probably be
14 partnered either to the university here, or possibly
15 the Center for Induced Seismicity out of University of
16 Austin. Would like to keep it in New Mexico, of
17 course. But, you know, that is a possibility that --
18 that could be in our permitting process.

19 The permitting process has -- has been
20 relatively easy. And -- and I say this because most
21 other larger projects that I've been involved in, not
22 necessarily here at the OCD, but in my past jobs and
23 life, you know, as you've started from nothing and
24 you've got to figure it out yourself.

25 One thing that the EPA has done is

1 published immensely really good implementation manuals
2 and -- and, you know, error review manuals. This is
3 what you need to do. And it really holds your hand
4 through it. And it's -- it's just kind of exciting,
5 but I'm also a process nerd. So anyway, sorry to
6 elaborate too much there.

7 MS. RUSCAVAGE-BARZ: Well, at what
8 point in the Class VI permit compliance process, so
9 this is after the permit is issued, will the decision
10 to retain outside contractors be made?

11 MR. WRINKLE: So if -- if there is a
12 blatant -- let me -- let me put it this -- so if it's
13 not -- like, if it's not A or B, and there could be a
14 possibility that -- that we are looking at something
15 wrong or the operator is looking at something wrong in
16 a more complex issue, meaning, you know, your pressure
17 front is -- on your last report that you gave us, your
18 pressure front is showing, you know, that it -- that
19 it's moving outside of where you were supposed to or,
20 you know, I'm being very layman here. That may, you
21 know -- we'll -- we'll have that -- those open MOAs
22 with -- with tech and everything that we can just
23 reach out to them, have them vet things. Or if it's
24 as simple as your pressure's too high or, you know,
25 something very simple like that, then -- then yeah,

1 there's no need for that -- that contractor.

2 So it's going to be a spectrum of
3 things. And -- and, you know, I think we'll take
4 educated -- not guesses, I hate to say, but make
5 educated decisions on where we would need those
6 outside services.

7 MS. RUSCAVAGE-BARZ: Can you walk us
8 through the process, given that you said you're a
9 process nerd, for making the decision to bring on a
10 contractor and vetting the contractors that are
11 available?

12 MR. WRINKLE: So I -- I can at a -- at
13 a very high level. So -- so basically, my -- my
14 sister group, right, the admin group, which is under
15 the umbrella of our director, is ran by a different
16 deputy director, which helps us out in procurement.
17 So I believe right now there -- we have a procurement
18 SOP that is very, very detailed on how you -- you go
19 about getting contracts.

20 And I don't know the particulars of how
21 you decide if it's going to be out for bid or if it's
22 just attached onto an MOA or MOU. But those are
23 the -- basically the two avenues is you would put it
24 out for bid and then you would basically write an RFQ,
25 I believe. And then you write down the scope of work

1 and what you -- what's needed. And then people come
2 in and bid and then you score them based off of, like,
3 how many -- how many regulators have they, you know,
4 dealt with in the past?

5 You know, their references, how -- how
6 well the -- the references, you know, letters in -- in
7 their application look. And those are the things that
8 I can remember. I've only been involved in about two
9 or three of those. But I do know that that's the
10 general gist. It's very fair, very open of who could
11 apply for that.

12 MS. RUSCAVAGE-BARZ: Okay. Thank you.
13 I want to shift over to program funding. And
14 according to page 6 of your written testimony, and
15 you've also stated this earlier, "OCD will primarily
16 rely on funding sources from the state general program
17 to fund the Class VI program." Is that correct?

18 MR. WRINKLE: That is correct. Yes.

19 MS. RUSCAVAGE-BARZ: And OCD will also
20 pursue grant opportunities as they become available?

21 MR. WRINKLE: Yes, of course.

22 MS. RUSCAVAGE-BARZ: And supplemental
23 funding through grants is not guaranteed; correct?

24 MR. WRINKLE: I -- it -- it never is.
25 Yeah.

1 MS. RUSCAVAGE-BARZ: In the event of a
2 funding shortfall from the general fund, what funding
3 contingencies is OCD considering that would ensure
4 continued funding of the permit oversight and
5 enforcement part of the program?

6 MR. WRINKLE: I -- I've never really
7 been in a general funding crisis before, but I would
8 assume, and I -- I don't like to assume things, is
9 that, you know, in a critical -- you know, we -- we
10 are -- like, when COVID happened, right, you had your
11 critical people, right, that had to keep going. I do
12 believe OCD as a whole, even if it was down to a
13 skeleton crew or even furlough or -- or things of that
14 nature, the -- the state would -- would have to
15 continue to fund us because of the -- the acceptable
16 risk is just -- you know, it's not acceptable for some
17 of the things that we oversee.

18 MS. RUSCAVAGE-BARZ: Well, in the event
19 of a funding shortfall for the Class VI program, would
20 OCD place a moratorium on new permit approvals to
21 ensure that it has adequate capacity for oversight and
22 enforcement of existing Class VI wells?

23 MR. WRINKLE: Can you explain the --
24 like the moratorium concept?

25 MS. RUSCAVAGE-BARZ: Would you stop

1 approving permits for new Class VI wells in order to
2 ensure that you have the resources to oversee and do
3 enforcement for existing wells?

4 MR. WRINKLE: Okay. Yeah. No. I
5 think that that decision would -- would have to be
6 made when we get there. I also am not sure if EPA
7 has, you know, some rule that we can't do that; right?
8 And they would take primacy away from us. But -- but
9 I think that that would be something that we would
10 have to just visit and make the best decision when --
11 when -- if we got to that point.

12 MS. RUSCAVAGE-BARZ: Do you have any
13 specific measures in place, or will you, if you're
14 granted primacy, have measures in place to deal with a
15 situation like I just described?

16 MR. WRINKLE: I think that could be --
17 that could be asked of anything that we do; right?
18 And I -- I think that there was a point years and
19 years ago that a lot of people got furloughed, but
20 they may -- they may do. At that point, I do, and I
21 hope that the Federal Government would step in with
22 funding because of the nature of Class VI and some --
23 and some of the other things that we do to continue us
24 to be funded.

25 I have, you know, personally received

1 the confidence of my superiors that this is going to
2 be funded no matter what -- no matter what the feds do
3 or -- or whatever happens. And -- and that's kind of
4 the best that I can give you on -- on that real high
5 level funding question.

6 MS. RUSCAVAGE-BARZ: Okay. I have one
7 last question for you. On page 9 of your written
8 testimony in answering the question, "How does the
9 state ensure that permit conditions remain protective
10 of underground sources of drinking water?" You
11 answered that "The review process will ensure that
12 permit conditions remain protective of underground
13 sources of drinking water." And you go on to explain
14 in detail in that paragraph how the review process
15 would accomplish this.

16 So can you similarly walk us through
17 how the processes for permit oversight and enforcement
18 will ensure that permit conditions remain protective
19 of underground sources of drinking water?

20 MR. WRINKLE: Meaning the -- the
21 auditing, the onsite visits? Okay. So because we
22 didn't try to incorporate this into our existing UIC
23 structure, knowing that they're overloaded, the -- the
24 other groups are overloaded right now as -- you know,
25 if you take a look at our -- our backlogs, you can

1 tell, that that was the main reason that we broke this
2 out into an individual group. So we could keep tabs
3 on that because the importance of Class VI and the
4 importance of -- of auditing these things and -- and
5 looking at those monitoring reports and -- and
6 reevaluation models, we knew that we had to have a
7 dedicated group for that. And that -- that is a -- a
8 sound judgment call, I believe, that myself and other
9 leadership made, you know, going into this -- this
10 whole rulemaking.

11 MS. RUSCAVAGE-BARZ: And I know I said
12 it was my last question, but I have one follow up to
13 what you said.

14 Earlier, you talked about the
15 availability of staff, geologists, engineers, et
16 cetera, and other programs that could be transferred
17 over in order to support the Class VI program. What
18 happens to the work and oversight that those others
19 are supposed to be doing?

20 MR. WRINKLE: Sure. So you know, I
21 mean, we're -- we're overloaded, but we're not that
22 overloaded to where I can't call Bob into a two-hour
23 meeting and him -- and consult with us on a certain
24 particular instance on something that -- that this
25 group is working on.

1 It's -- it wouldn't be like, "Hey, Bob,
2 I need you to do this whole site characterization."
3 The -- the group would basically do everything that
4 they could. Once they ran into where they thought
5 they needed extra consulting, then of course, they
6 would reach out to their peers, just like any other
7 workplace where you're -- you're cross-functional team
8 members.

9 And that's one thing that I do -- for
10 the -- the entire OCDs that we do. At least since
11 I've -- I've been here, I've noticed that -- that we
12 do work good cross-functionally, but we're not giving
13 that other person the entire task. It's -- it's a --
14 it's a consulting type situation.

15 MS. RUSCAVAGE-BARZ: Okay. I don't
16 have any more questions. Thank you, Mr. Wrinkle.

17 MR. WRINKLE: Thank you very much.

18 THE HEARING OFFICER: Now we're 30
19 minutes on the nose.

20 Mr. Tremaine, do you have any redirect?

21 MR. TREMAINE: I do. I have a -- a few
22 questions here. I'm wondering if it's a good time to
23 take a break or if you'd like me to proceed.

24 THE HEARING OFFICER: It's an excellent
25 time to take a break.

1 MR. TREMAINE: Okay.

2 THE HEARING OFFICER: Let's come back
3 at 2:45.

4 (Off the record.)

5 THE HEARING OFFICER: Thank you,
6 Sheila. All right. We're back after a short break.

7 Mr. Tremaine, do you have some
8 redirect?

9 MR. TREMAINE: I do. Thank you. If I
10 may share a screen here. I still have permission.
11 I'm going to start with a couple -- I -- I'd like to
12 ask some clarifying questions of Dr. Schnarr regarding
13 a discussion we had about producing zone, and
14 hopefully to distinguish different types of projects.

15 REDIRECT EXAMINATION

16 BY MR. TREMAINE:

17 MR. TREMAINE: So Dr. Schnarr, do you
18 see what I have on screen, a slide from your
19 demonstrative exhibit?

20 DR. SCHNARR: Yes.

21 MR. TREMAINE: Okay. And is there --
22 and do you recall the recent discussion, cross-
23 examination between Mr. Pavlik and Mr. Eales regarding
24 Class VI injection potentially into production zones?

25 DR. SCHNARR: Yes.

1 MR. TREMAINE: Okay. And is there a
2 very specific instance in which Class VI could
3 theoretically be permitted in a producing zone?

4 DR. SCHNARR: Yes. These list here
5 is -- is copied verbatim from the proposed regulation,
6 which is also identical to the Federal Rule. And it
7 is envisioned that there may be limited instances
8 where a Class -- what is now permitted as a Class II
9 project would transition to a Class VI. And along
10 that transition period, there may be some limited
11 amount of production, but the requirement would be for
12 that to come in as a Class VI.

13 MR. TREMAINE: So if those projects
14 that you're talking about are currently permitted as a
15 Class II project, is that what we're -- we would refer
16 to as an enhanced oil recovery project, or EOR?

17 DR. SCHNARR: Yes. Typically.

18 MR. TREMAINE: Okay. Yeah. So it's a
19 gas flood or CO2 flood operation?

20 DR. SCHNARR: Yes.

21 MR. TREMAINE: Okay. And this process
22 that we discussed, and that you provided on slide 26
23 of your demonstrative, this is not -- do you agree
24 that this is outside the context of a new proposed
25 sequestration facility?

1 DR. SCHNARR: This would be
2 transitioning an existing Class II out of a Class VI,
3 not a new Class VI project.

4 MR. TREMAINE: Okay. So this situation
5 that we're describing, we're not talking about
6 plopping a new sequestration facility in the middle of
7 the Bone Springs Wolfcamp where active new production
8 is going on; correct?

9 DR. SCHNARR: This was envisioned as a
10 scenario where an operator is already performing
11 themselves a Class II operation, but the objective of
12 the project is to transition to sequestration. And
13 for that reason, the director may require that they
14 obtain a Class VI permit.

15 MR. TREMAINE: Okay. And that -- am I
16 understanding correctly that that is at the discretion
17 of the director if the intent of the project changes,
18 and what you have listed here are the safeguards or
19 criteria for the director to make that decision?

20 DR. SCHNARR: These are the
21 requirements for the director to consider if what is
22 existing Class II well should require an applicant to
23 apply for a Class VI well.

24 MR. TREMAINE: Okay. Thank you. Come
25 back to that in a moment. I'd like to ask you a few

1 questions on the topic of public engagement. Bear
2 with me for a moment.

3 Dr. Schnarr, I believe in your
4 testimony, in multiple points in your testimony,
5 you've indicated that New Mexico already has primacy
6 for Classes I through V; correct?

7 DR. SCHNARR: Yes.

8 MR. TREMAINE: Okay. Because New
9 Mexico already has primacy for Classes I through V,
10 the current Class VI application would constitute a
11 program modification; correct?

12 DR. SCHNARR: Yes.

13 MR. TREMAINE: Okay. Is modification
14 the right word? Modification, revision?

15 DR. SCHNARR: I -- I believe so.

16 MR. TREMAINE: Okay. And Ms. Raney,
17 are you aware that there are specific rules for public
18 notice related to OCC rulemakings?

19 MS. RANEY: Yes.

20 MR. TREMAINE: Okay. And in your
21 testimony earlier, I believe that you had outlined
22 some of the requirements or structure of public
23 comment and public participation in the EPA primacy
24 context; correct?

25 MS. RANEY: Yes.

1 MR. TREMAINE: Okay. And you would
2 agree that those are two different public engagement
3 requirements?

4 MS. RANEY: Yes.

5 MR. TREMAINE: Okay. As a program
6 modification, is the Division, or the state of New
7 Mexico, required to engage in a public comment process
8 by the EPA?

9 MS. RANEY: At the very end of the --
10 the application review process, there is a public
11 comment period, but that is the single public comment
12 period, I believe.

13 MR. TREMAINE: And that public comment
14 period is -- occurs at the federal level?

15 MS. RANEY: Yes.

16 MR. TREMAINE: During EPA's
17 consideration of the final application?

18 MS. RANEY: EPA's -- yes.

19 MR. TREMAINE: And that's at a point
20 when the EPA is considering whether to grant primacy
21 to the state of New Mexico; correct?

22 MS. RANEY: Correct.

23 MR. TREMAINE: Okay. The EPA does not
24 require the state of New Mexico to engage in a
25 particular public comment process related to the

1 modification before the final application?

2 MS. RANEY: No.

3 MR. TREMAINE: Thank you. Ms. Raney,
4 you had a -- received a couple questions earlier
5 related to the State Tribal Consultation Act. Do you
6 recall that?

7 MS. RANEY: Yes.

8 MR. TREMAINE: Okay.

9 And for the record, I believe that the
10 questions are referring to 11.18.3.

11 BY MR. TREMAINE:

12 MR. TREMAINE: Ms. Raney, is it
13 consistent with your understanding that tribal
14 consultation letters take the form of formal
15 sovereign-to-sovereign communications?

16 MS. RANEY: Absolutely. That was the
17 intention. Yes.

18 MR. TREMAINE: Okay. Would you agree
19 with the statement that the tribal consultation
20 letters that you referred to were sent by Energy
21 Minerals and Natural Resources Department Office of
22 the Secretary?

23 MS. RANEY: Correct.

24 MR. TREMAINE: Okay. So those
25 letters -- I believe in your testimony earlier, you

1 had referred to this project group as sending those
2 letters. And I just want to clarify specifically that
3 they were sent by OFS.

4 MS. RANEY: Thank you. I -- I'd spoke
5 out of turn. Thank you. It was -- the secretary sent
6 those out.

7 MR. TREMAINE: And you're generally
8 familiar with the content of the letters?

9 MS. RANEY: Yes.

10 MR. TREMAINE: Okay. Would you agree
11 that those letters included an invitation to
12 participate and to consult and to ask any questions
13 that any of the recipients of those letters have?

14 MS. RANEY: Yes.

15 MR. TREMAINE: Okay. And are you,
16 Ms. Raney, aware of any tribal entities or tribal
17 governments or representatives that requested to
18 participate, but were not permitted to participate?

19 MS. RANEY: No.

20 MR. TREMAINE: Okay. Dr. Schnarr, back
21 to you. Are you aware of any tribal nation or
22 government that is currently pursuing Class VI
23 primacy?

24 DR. SCHNARR: My most recent review of
25 who's coming in for primacy, the Navajo Nation does --

1 is listed on the EPA website at some stage of -- of
2 coming in for primacy.

3 MR. TREMAINE: Okay. So the
4 governmental representatives of the Navajo Nation are
5 pursuing primacy on their own sovereign land is your
6 understanding.

7 DR. SCHNARR: I really don't know much
8 more, that I just saw that it's listed on the -- EPA
9 has a -- a Class VI primacy tracker and that they are
10 listed at some preliminary stage.

11 MR. TREMAINE: Ms. Raney, have you been
12 consulted or contracted by the Navajo Nation to
13 consult with individual members or any member of the
14 Navajo Nation other than what you would do as part of
15 this outreach to official representatives?

16 MS. RANEY: No.

17 MR. TREMAINE: Thank you. I want to
18 ask a couple questions about permits and unitization
19 discussions.

20 Dr. Schnarr, do you agree that
21 currently the EPA may permit a Class VI well in New
22 Mexico?

23 DR. SCHNARR: Yes.

24 MR. TREMAINE: Okay. And in your
25 experience, does the EPA require any specific

1 demonstration of pore space ownership?

2 DR. SCHNARR: No. It's not a specific
3 part of their formal process.

4 MR. TREMAINE: Thank you.

5 Mr. Wrinkle, do you agree that OCD
6 currently permits injection wells under the UIC Class
7 II primacy program?

8 MR. WRINKLE: Yes, I do.

9 MR. TREMAINE: And - well, let's reset.
10 One moment. Perils of using webpages during -- pardon
11 me.

12 Mr. Wrinkle, are you generally familiar
13 with the work that your team does related to
14 compulsory pooling in New Mexico?

15 MR. WRINKLE: Generally, yes.

16 MR. TREMAINE: Okay. Would you agree
17 or are you aware that the Division has a rule in
18 Section 19.15.13 specifically related to compulsory
19 pooling?

20 MR. WRINKLE: Yes.

21 MR. TREMAINE: Okay. I'm going to ask
22 you to look at -- do you agree that the compulsory
23 pooling rule specifically relates to the pooling of
24 working interests, of pooled working interests?

25 MR. WRINKLE: Yes. I -- I agree.

1 MR. TREMAINE: I'm going to ask you to
2 read 19.15.13.7(c) for the Commission's information.

3 MR. WRINKLE: "Pooled working interest
4 means a working interest or" -- unleashed "unleased
5 mineral interest that is pooled by Division or
6 Commission order and not by voluntary agreement of the
7 owner of interest, except for an unleashed mineral
8 interest on federal, state, or tribal lands."

9 MR. TREMAINE: Mr. Wrinkle, in your
10 experience, does the OCD compulsorily pool state,
11 federal, or tribal lands or minerals?

12 MR. WRINKLE: No.

13 MR. TREMAINE: Do you have any reason
14 to believe, or is there any reason you are aware of,
15 that OCD would treat pore space differently than
16 mineral interest in a unionization or pooling context?

17 MR. WRINKLE: Yeah, there would be no
18 reason to.

19 MR. TREMAINE: Separately, Mr. Wrinkle,
20 are you aware that the -- or do you agree that some of
21 the operational requirements of the Oil Conservation
22 Division include the prevention of waste and the
23 protection of correlative rights?

24 MR. WRINKLE: 100 percent agree.
25 That's -- that's our -- our main mission.

1 MR. TREMAINE: If you, in my
2 hypothetical, where we have a Class VI permittee
3 seeking to inject carbon into a producing zone, such
4 as the Bone Springs Wolfcamp, which is my favorite
5 example, you know, a very -- an active producing zone,
6 when reviewing that permit, would the Division look to
7 factors such as impacts to correlative rights or
8 waste?

9 MR. WRINKLE: Yes. Current --
10 currently in our -- in our other UIC programs, and --
11 and in this one, there would be no change, that is one
12 of the first things that we would look at.

13 MR. TREMAINE: Does OCD look at the
14 issues of the prevention of waste and protection of
15 correlative rights if and when it's permitting
16 injection wells under Class II currently?

17 MR. WRINKLE: Yes.

18 MR. TREMAINE: Okay. Generally
19 speaking, is a permit for, like, a salt water disposal
20 something that you would expect to be authorized into
21 an active producing zone?

22 MR. WRINKLE: Absolutely not.

23 MR. TREMAINE: Okay. Mr. Wrinkle, just
24 a couple more questions for you. We received some
25 questions during both, I think, the -- perhaps during

1 your testimony and also during cross-examination of
2 Ms. Raney. And so do you recall OCD engaging in this
3 process in the development of draft frequently asked
4 questions?

5 MR. WRINKLE: Re-ask that. I'm sorry.

6 MR. TREMAINE: Do you recall draft
7 frequently asked questions prepared by the Division
8 related to this rulemaking hearing?

9 MR. WRINKLE: I -- I do recall. I was
10 not directly involved with it other than being
11 consulted about some of the decisions that we made.
12 But yes, I -- I am familiar with that.

13 MR. TREMAINE: Great. And are you -- I
14 believe in your testimony you had indicated that OCD
15 is and will continue working on guidelines associated
16 with implementation of certain aspects of the rule.
17 Is that correct?

18 MR. WRINKLE: That is correct. So
19 it -- it will be placed on our new operator guidance
20 page where -- where all that stuff lives. And we're
21 going to try to make it as specific as possible.

22 MR. TREMAINE: And do you agree that
23 frequently asked questions or guidelines will
24 specifically be required for areas where the Division
25 proposes to be more stringent?

1 MR. WRINKLE: Yes.

2 MR. TREMAINE: Okay. Would you also
3 agree that in the event that the Commission were to
4 adopt a rule requiring a more stringent requirement
5 than is currently proposed in the application, that
6 that would require a specific either FAQ or guidance
7 document?

8 MR. WRINKLE: Yes. So our -- our
9 general MO when -- when writing operator guidances is
10 to separate out either geological areas or contextual
11 areas, to separate those out of basically a decision
12 tree model of, if this is met, then do this. If this,
13 then do this. So yeah, it would -- it would follow
14 that same structure like we do all of our operator
15 guidances.

16 MR. TREMAINE: All right. Mr. Wrinkle,
17 as a program manager and engineering bureau chief,
18 would you final -- ever deem it prudent to finalize
19 frequently asked questions or guidelines prior to
20 promulgation of a final rule?

21 MR. WRINKLE: Oh, gosh. No.

22 MR. TREMAINE: Okay. Thank you.

23 Sorry. I have one question I need to
24 jump back to, Dr. Schnarr. So we had discussed
25 briefly your response to this possibility of a Class

1 II to Class VI transition. And so I just want to
2 clarify for you.

3 In your testimony relate -- regarding
4 this potential under the rule, does your answer
5 incorporate any legal analysis regarding the Oil and
6 Gas Act, specifically the mandates to prevent waste or
7 protect correlative rights?

8 DR. SCHNARR: No.

9 MR. TREMAINE: Okay. So you're --
10 okay. Thank you.

11 One moment, Madam Hearing Officer.

12 THE HEARING OFFICER: Okay.

13 MR. TREMAINE: No further redirect.

14 THE HEARING OFFICER: Thank you very
15 much, Mr. Tremaine.

16 Commissioner Ampomah, do you have
17 questions of this panel?

18 DR. AMPOMAH: Yes, I do. So my level
19 of questionings will be in different categories. So
20 the first one will be general questions that I will
21 ask based on the direct testimony and then the
22 rebuttal. And then also I will walk through the rule
23 line by line with you. And then also I'll walk
24 through some suggested amendments for your
25 consideration as well.

1 I will start with Mr. Wrinkle, and I'll
2 go to Dr. Schnarr, and then I'll go to Mr. Eales, and
3 then I'll go to Ms. Raney in that order. That will be
4 for the general questions based on the testimony.

5 But when I get to the walkthrough, the
6 rule, then that one will be more or less open to
7 anyone to respond to that. In addition to, based on
8 the comments that I also provide, then the whole panel
9 can respond to that.

10 CROSS-EXAMINATION

11 BY DR. AMPOMAH:

12 DR. AMPOMAH: Mr. Wrinkle, so I will
13 start with you. And thanks so much for the redirect
14 because it answered most of my questions with regards
15 to the Class II, Class VI transitions, but I still
16 have a few there, so we'll get to that. Okay.

17 Now, let me ask you. So you said that
18 there is a possibility that OCD might use the service
19 of independent contractors to support your reviews.

20 Now, my question to you is, how will
21 OCD -- how will OCD independently evaluate a
22 contractor's conclusions, particularly when the
23 contractor is reviewing a proprietary reservoir model?

24 MR. WRINKLE: So the -- the question
25 is, how -- how will OCD know that the contractor they

1 hired did a good job on -- on the model?

2 DR. AMPOMAH: Exactly.

3 MR. WRINKLE: Well, short of hiring
4 another contractor to vet that contractor, I think
5 there -- there is a risk there, but I -- I believe
6 it's most likely minimal. And the reason that I say
7 that is from listening to -- to one of the doctor's
8 testimonies about, you know, inputs are -- are based
9 on physics; right? And -- and, you know, not being a
10 layman at this, it -- it just draws the conclusion
11 that the two models are a good enough indicator for,
12 you know, the -- the truth in there somewhere.

13 And then also the -- the two-year
14 reevaluation after data is collected, I think that
15 just refines it a little bit. Again, speaking as a
16 layman.

17 DR. AMPOMAH: In your estimate, as you
18 are thinking through the total number of people that
19 will be hired through -- to oversee this program, have
20 you also factored into that calculation how many
21 applications that OCD can handle at a time?

22 MR. WRINKLE: Yeah. So when we -- when
23 we did an exploratory, you know, looking -- looking in
24 where our staffing levels should be, we -- we looked
25 at what the current EPA regions were doing and how

1 many staff that they had assigned to how many
2 applications.

3 Now, being that they -- that they were
4 probably pulled in -- in many different directions,
5 we -- we landed on basically a mirror of about three
6 people to oversee potentially 15 per year. And that's
7 basically what the -- what the EPA was doing.

8 And I think, you know, the -- the
9 reason for that is most of the time in any of these
10 permitting situations, you know, the applicant is
11 doing a lot of the heavy lifting and kind of -- kind
12 of like us drafting this rule, presenting it to -- to
13 you, and then -- and then you asking us questions.

14 So I think, you know, it -- it seems
15 like a lot; right? But -- but the applicant is
16 actually doing a lot of that and we're kind of, for
17 lack of better words, poking holes in that application
18 to -- to vet it for -- to be a good application.

19 DR. AMPOMAH: I guess I know you're
20 doing your job. That's good. Okay.

21 Let me ask. So we discussed about the
22 strategy, how EPA is reviewing the applications. And
23 for this question, Dr. Schnarr can jump -- jump in and
24 help you out.

25 Now -- so Dr. Schnarr, you've done a

1 lot of these EPA applications. You've received --
2 you've reviewed numerous of EPA's revisions, reviews
3 on these applications. Do you believe that those are
4 really extensive reviews and it's more comprehensive
5 enough?

6 DR. SCHNARR: Yeah. I -- I've been
7 involved in obtaining Class VI permits, both with
8 different EPA regions and actually at least one other
9 primacy state. And it -- I would say -- is your
10 question whether or not I thought those reviews were
11 extensive enough?

12 DR. AMPOMAH: Let me -- let me be clear
13 more.

14 DR. SCHNARR: Yeah.

15 DR. AMPOMAH: So you have, let's say,
16 EPA giving area of review prudent narrative to a
17 national lab to review with no experience with our
18 geology -- with the geology. No experience with
19 regards to the type of, like, fluids, whatever, in
20 that basin. So I mean that context, when you have
21 folks from, let's say, National Labs, reviewing AoR
22 applications, reviewing important narrative, mostly on
23 the geology, geophysics, without any extensive
24 knowledge, when you read through those questions, you
25 know for sure who reviewed this, whether they have the

1 technical ability to review it or not?

2 DR. SCHNARR: Yeah. I'd say actually
3 when the comments come in, in some cases, I've been
4 aware that they were reviewed by the National Labs, in
5 other cases, I'm not sure. We -- we can guess. And
6 in some cases, I think that some of the applicants
7 were not sent to National Labs in particular.

8 I think to answer your question, I'm
9 struggling a little bit because I'd say it's really a
10 variable. And there are definitely some cases where I
11 do not think the reviews were particularly thorough or
12 on the mark, or they may focus on one very technical
13 point and kind of maybe miss some of the other broader
14 picture. But I think that's kind of, in some cases,
15 maybe to be expected. But yes, I'd say in some cases,
16 they are thorough. In some cases, I -- I do not think
17 as much, no.

18 DR. AMPOMAH: Okay. Then let me go
19 back to Mr. Wrinkle.

20 So Mr. Wrinkle, you talked
21 about -- primacy because we can control our own
22 geology. We have all the knowledge and all of that.
23 Now -- so in your testimony, you're talking about in
24 areas where OCD do not have expertise in or do not
25 have the manpower, you want to contract out.

1 MR. WRINKLE: Yes.

2 DR. AMPOMAH: Are you not going to get
3 into that same situation, with what we just talked
4 about, if you are not using your actual state agencies
5 that do have the knowledge to support you?

6 MR. WRINKLE: No, that's a -- that's a
7 very good question. And -- and the -- we have thought
8 about this. And the -- the reason that I -- that I
9 answered one of the questions earlier is wanting to
10 keep it in New Mexico is basically because of that.
11 Because we have very unique geology.

12 You know, when we do open up -- if we
13 do open up the RFI, say the rule is promulgated, you
14 know, and -- and we're going to move forward, you
15 know, one of the vetting questions is going to be how
16 familiar you are with Permian and San Juan basins.
17 And that's going to provide a scoring; right?

18 And that -- that's one of the main
19 reasons that we -- you know, we have to do that part
20 right, meaning -- and -- and point taken. That --
21 that's a very good point because we are very unique,
22 almost as unique as Pennsylvania; right? So you need
23 that -- that local expertise.

24 And I would -- being on the deciding
25 committee of that RFI, if -- if I am, you know, really

1 push for that to be a -- hold more weight than maybe
2 the other categories that are in that RFI.

3 DR. AMPOMAH: Thank you. Now, let me
4 ask. So will OCD establish target periods, I mean,
5 I'm talking about timelines, for completeness review,
6 technical review, request for additional information,
7 drafts permit preparation, and final decisions?

8 MR. WRINKLE: What -- how did we do
9 that, you mean, or --

10 DR. AMPOMAH: Well, will OCD do that?

11 MR. WRINKLE: Oh, yes. Yeah,
12 definitely. And that's currently what the team is
13 working on, is timelines. There -- there's -- I can't
14 pinpoint it. It was on a -- a Teams chat earlier that
15 I was having with my team. But one of the areas --
16 and Dr. Schnarr might be able to -- to answer this,
17 but one of the areas where we were a little bit more
18 stringent than EPA was giving deadlines for response
19 to comments.

20 One of the things that we've
21 experienced in other areas where -- where we permit
22 things, well, just about anything, is non-response
23 from an applicant. And then it goes into this kind of
24 limbo state. So we wanted to make sure that there was
25 a timeline that the OCD could take some type of action

1 to say, okay, you know, either this is dead in the
2 water, or your permit is going to the bottom of the
3 pile.

4 But to -- to answer your question in
5 more -- in more broad -- broad context, there -- there
6 are goals; right? And there -- there are certain, you
7 know, public comment periods. You know, how long does
8 it take to do a compensational model?

9 Building in that -- that mandatory 30-
10 day reply period is going to help tighten up those
11 forecasts of how long a permit should take. But in
12 all reality, it's going to take as long as it's going
13 to take until we're happy with it, that it makes sense
14 and is safe to -- to do.

15 DR. AMPOMAH: And OCD will be more
16 transparent with the timeline to the applicants?

17 MR. WRINKLE: Yes. That -- that is our
18 plan, is -- is to produce very robust operator
19 guidance with -- with timelines and those mandatory
20 timelines on -- on their side as well.

21 DR. AMPOMAH: I will point out, though,
22 so you said probably -- you made an example, 30 days.
23 So that's just an example; right? Not necessarily --

24 MR. WRINKLE: Well, that's an example
25 that I believe that we wrote into the rule. I

1 believe. I could be wrong, but I -- I can vet that.

2 DR. AMPOMAH: Yeah. Okay. So then we
3 will probably have to check that because I'm not sure
4 how a company can respond to AoR questions in 30 days.

5 MR. WRINKLE: Well, they -- they can
6 definitely request an extension.

7 DR. AMPOMAH: Okay.

8 MR. WRINKLE: Yes.

9 DR. AMPOMAH: Okay. Okay.

10 MR. WRINKLE: That's the caveat.

11 DR. AMPOMAH: Okay. Thank you. Now,
12 you talked about the fact that once OCD issues the
13 permit is for two years and with a good cause it can
14 have extension.

15 MR. WRINKLE: Yes.

16 DR. AMPOMAH: Now, let me ask, what
17 written standard will OCD use to determine whether
18 good cause supports extending a two-year construction
19 permit?

20 MR. WRINKLE: We -- we've started
21 talking about -- we're authoring that internally.
22 But, you know, most -- most things that we're going to
23 consider good cause are going to be either tangible.
24 Tangible things. Well, yeah. Most all are, you know,
25 right of ways, you know, getting material, specialized

1 drilling rig, you know, availabilities. Things that
2 are kind of out of the applicant's control.

3 Now, when you start talking about, you
4 know, well, we're -- we're waiting on capital; right?
5 Or -- or something like that, then, you know, it's
6 going to hold a little bit less weight than, say, an
7 operational justifiable issue that -- you know, a lot
8 of us come from industry. So we do understand those
9 and -- and can probably come up with a comprehensive
10 list of -- but ultimately, it's up to the director or
11 his designee.

12 DR. AMPOMAH: Now -- so I do know that
13 OCD do have enforcement processes. Now, is there
14 going to be a different process for the UIC Class VI
15 wells in terms of enforcement escalation process that
16 you're going to use? Is it going to be existing rules
17 or are you going to more or less come up with a new
18 enforcement processes for the Class VI?

19 MR. WRINKLE: Yeah. I -- I mean, it --
20 it kind of comes with the territory when you're
21 talking about Class VI. It -- it's different than --
22 than some of the other classes. I mean, you know, all
23 of them are -- are serious; right? But I would say
24 that we would use our -- our already in place internal
25 processes for, you know, like I was explaining how

1 that goes up the chain of command.

2 But I do believe that the -- the Class
3 VI will -- will have altercations to that -- that
4 process because some things are way more serious than
5 others, and those need to be identified. And then
6 needs to be put into practice of -- of where that
7 goes, who it goes to, and what the levity of is -- of
8 each individual non-compliance issue.

9 DR. AMPOMAH: So let me ask, are there
10 any records that will be maintained permanently as
11 part of the application files?

12 MR. WRINKLE: Currently?

13 DR. AMPOMAH: Mm-hmm.

14 MR. WRINKLE: Our records retention
15 policy, I'm not very, very familiar with that. But I
16 know that, you know, everything that's in our imaging,
17 as long as the server's running and has power, it's
18 going to be there. And that's about the extent I -- I
19 know of that. I know that there are certain retention
20 policies, but I would have to review those to give you
21 a -- a meaningful answer.

22 DR. AMPOMAH: Thank you. Yeah. So I
23 want to talk to you a little bit about the
24 administrative appeals and commission jurisdiction.
25 So I do know there has been a lot of discussions back

1 and forth. It's just because there's no appeal
2 process established in the current rule that we are
3 reviewing. So I just want to ask you, who may appeal?

4 MR. WRINKLE: I -- I believe that in --
5 in the rule that I cited, and I -- and we can pull it
6 up. I -- I believe it's anybody with standing.

7 DR. AMPOMAH: Who has standing?

8 MR. WRINKLE: Well, I'm not an
9 attorney.

10 DR. AMPOMAH: Okay. So you cited the
11 rule, but did we -- did you have that in the rule that
12 we are looking at right now? Reference it.

13 MR. WRINKLE: No. No. So in my -- you
14 saying something? Oh, okay. So -- okay. So in --
15 I'm watching your finger over there, Jesse.

16 So in my -- in my meeting with -- when
17 I -- when I was drafting my rebuttal to, I believe it
18 was -- was Oxy's witness, we felt that since that was
19 already there in -- in the other rule that I cited,
20 that -- that it would add no value to place it in here
21 because there already is a pathway for -- for them to
22 do -- to do an appeal on -- on the books for anything.

23 MR. TREMAINE: And Commissioner
24 Ampomah, so I -- I'd just like to clarify because
25 there was an addition to the rule that was made purely

1 on a legal basis, and Mr. Wrinkle cannot testify to
2 that.

3 So if you look at the -- page 16, the
4 last page of OCD Exhibit 2, we specifically identify
5 this is not an EPA Rule. I'm moving as not
6 confidential. He's not going to testify to any
7 processes here, but we specifically included a
8 requirement that all enforcement be conducted under
9 the existing -- the existing enforcement rules.

10 We did not make that same clarification
11 regarding adjudication or appeals, but Mr. Wrinkle
12 cannot testify regarding his standing, et cetera.
13 There's -- there's OCD cases on that, et cetera. So
14 I'm hoping that helps to just clarify for the record.
15 BY DR. AMPOMAH:

16 DR. AMPOMAH: So is it still OCD's
17 position that we don't necessarily have to have any
18 appeal provision in this rule?

19 MR. WRINKLE: That's currently my
20 understanding with -- with internal legal and
21 leadership.

22 DR. AMPOMAH: But when we did the
23 plugging, we did have that. The plugging rules.
24 Yeah, we did had -- OCD can -- let's say if OCD
25 doesn't respond to, let's say, an extension, then it

1 goes off and an operator can appeal. So even we still
2 incorporated that in there. But I'm just thinking
3 about for completeness of the rule.

4 MR. WRINKLE: No, I -- yeah, I -- I
5 completely understand. I understand.

6 DR. AMPOMAH: So it -- it doesn't hurt
7 if, let's say, we more or less even use what Oxy
8 suggested. Just a line saying that the decision by
9 the director can be appealed. Would you agree to
10 that?

11 MR. WRINKLE: I -- I don't know if --
12 if I would agree. I would just say I'm open.

13 DR. AMPOMAH: Okay. Okay. At least
14 you're open to that. Okay. Thank you.

15 Now, let me ask you, so which agency
16 will maintain records and oversee the site after
17 stewardship transfer? Do you know?

18 MR. WRINKLE: You -- you're talking
19 about the -- the period after the site has been
20 released after the PISC?

21 DR. AMPOMAH: Yes. So this will be
22 under Stewardship Act implementation and long-term
23 state responsibility.

24 MR. WRINKLE: Okay. Yeah. I -- you
25 know, I -- you're not going to like my answer, but --

1 but it is to be decided. We're -- we're weighing, you
2 know, do we have the capability on our servers, our
3 system, to maintain that, or do we need to contract,
4 again, a third party, like a university or something
5 of that nature to retain those records for us?

6 That is something that we're trying to
7 work through now rather than later, so we have a solid
8 plan in place, you know, before we jump in and start
9 reviewing these permits.

10 DR. AMPOMAH: Let me check to see if I
11 do have any questions -- additional questions for you.
12 Yes, I do.

13 And this one is going to be under the
14 financial assurance and then self-insurance. Is OCD
15 going to rely on independent financial professionals
16 to review those financial assurances or you do that
17 internally?

18 MR. WRINKLE: Currently, I -- I know
19 that we do that internally. But are you talking about
20 the -- like, a surety bond, those type of things?
21 Because there's a difference between internal review
22 if we do a -- let's say a corporate guarantee or, you
23 know, just -- just a -- a bond; right?

24 So if it's a bond, then -- then we do
25 have an administrative compliance department that

1 reviews those.

2 The technical role is basically vetting
3 all of their -- their quotes and -- and everything to
4 make sure that that is legit. And it will cover the
5 cost. Plus, I believe that there is something in --
6 in the rule in front of us that talks about inflation;
7 right? It's a -- it's a -- a tax, something like
8 times 22 million or something like that. It's --
9 but -- but that -- in context, that's not money
10 context. I -- I believe that's just kind of what tax
11 uses as a -- a saying; right? Name -- nomenclature.

12 For a corporate guarantee or self-
13 insurance, that -- that goes to our legal department
14 for -- for review. The -- we've done a few of them.
15 And then since it's a little bit more complicated than
16 looking at, you know, the -- the technical side of
17 things, okay, this is how much it costs. You go get a
18 surety bond for \$750,000. The administrative bureau
19 looks at that and says, yep. It -- it aligns with
20 what the technical people said. Bond is accepted.
21 The corporate guarantee is a little more complicated.
22 So we've -- we've got to bring in the -- the legal
23 team to -- to look at those things.

24 DR. AMPOMAH: So has self-insurance
25 more or less been successful in the past in other

1 programs?

2 MR. WRINKLE: I -- I believe there's a
3 couple that we have done. I -- I don't know the
4 thresholds that they -- they have to meet. It --
5 it's -- it's a lot of corporate accounting mumbo jumbo
6 that I've avoided like to plague my career. But I --
7 I do believe that for some operators, my personal
8 opinion, I -- I think self-assurance would -- would
9 work for them. In others, it might not.

10 DR. AMPOMAH: So definitely there will
11 be more like a -- a financial test threshold to
12 determine which company?

13 MR. WRINKLE: I -- I believe so.
14 The -- at the very high level that I understand it,
15 yes. It would -- it would be, you know, how -- how
16 much capital you have, how much liquidity --
17 liquidity, you know, et cetera. Which I'm just
18 throwing out buzzwords on -- on that subject. But I
19 do believe that that is -- the case is, you know,
20 how -- how much free capital you have and whatnot.

21 DR. AMPOMAH: So can a parent company,
22 guarantees or self-insured, survive bankruptcy or
23 corporate restructuring?

24 MR. WRINKLE: I -- I couldn't answer
25 that for sure.

1 DR. AMPOMAH: Okay.

2 MR. WRINKLE: I'm -- I'm sorry.

3 DR. AMPOMAH: Okay. Now, let's talk
4 about permit transfers and corporate changes, if you
5 can. Okay.

6 MR. WRINKLE: A little bit, yeah.

7 DR. AMPOMAH: Okay. Now, does a major
8 change of control, transfer of subsidiary, bankruptcy
9 reorganization, or transfer of professional control
10 require prior OCD approval?

11 MR. WRINKLE: Yeah. I believe -- I --
12 and I -- I might ask Dr. Schnarr to help me out on
13 this one, but I believe that the EPA allows automatic
14 transfers. And that's where we were a little bit
15 more -- are you talking about operatorship transfers
16 of -- of the -- of the actual well itself?

17 DR. AMPOMAH: Yeah. Of the projects.
18 Yes.

19 MR. WRINKLE: Yeah. And that's where
20 we were a little bit more stringent -- well, more
21 stringent is that you don't get the automatic
22 transfer. You have to get prior OCD approval.

23 DR. AMPOMAH: Now, as the transfer is
24 going on, or as they're going through that process, at
25 what point does the transferer cease to be responsible

1 for the Class VI project?

2 MR. WRINKLE: I -- I would have to -- I
3 would have to study a little bit more and -- and get
4 you a -- a meaningful answer to that.

5 DR. AMPOMAH: Okay. Then let me pause
6 on the transfer questions.

7 Now, can OCD remotely access real-time
8 operating and monitoring data during an emergency?

9 MR. WRINKLE: I -- I believe so. I --
10 I might have to punt to somebody else on that one, but
11 the -- the monitoring program, it -- it -- it's
12 instantaneous monitoring, or close to it. You know --
13 you know, pressure gauges, stuff like that. It's
14 either available to us instantaneously or we can
15 request that. I -- I would have to, again, look at
16 the -- look at the specifics of that. But there are
17 requirements for, you know -- I -- I've -- I've seen
18 PLCs in the pass before that -- every 33 seconds.

19 And you -- you can answer that,
20 Mr. Eales? Okay. Go ahead.

21 MR. EALES: So your question was, can
22 OCD see live data from wells?

23 DR. AMPOMAH: In -- in terms of
24 emergency.

25 MR. EALES: In terms of an emergency.

1 At this point, there's no connection to OCD from any
2 of the plant or -- or planned emergency response
3 systems. And a lot of that's, from my experience,
4 very much based on the different systems, softwares,
5 and methodologies for, like, HMI systems that report
6 that data.

7 So to try to get that software,
8 multiple software choices that different operators may
9 choose into one control room scenario in OCD would be
10 difficult. But it -- it doesn't exist, to my
11 knowledge, right now.

12 DR. AMPOMAH: So let me turn over --
13 thank you so much, Mr. Wrinkle, for responding to my
14 questions. So I'll turn to Dr. Schnarr for a couple
15 of questions here.

16 I presume you did the final cross-
17 reference with your attorneys on the audit of the Part
18 41, 42, and 43. Were you involved in that?

19 DR. SCHNARR: Do you mean, like,
20 attorneys working with my firm?

21 DR. AMPOMAH: No, no, no, no. So let
22 me -- let me start with the first one.

23 DR. SCHNARR: Okay.

24 DR. AMPOMAH: So has OCD completed the
25 line-by-line? I know we discussed that. OCD attorney

1 discussed that. So I want to make sure if you were
2 involved in that process.

3 So has OCD completed line-by-line legal
4 and technical crosswalk confirming that every Federal
5 Class VI requirement has been incorporated correctly
6 and is so no less stringent?

7 DR. SCHNARR: I really -- as I'm not a
8 lawyer, I can't really speak to a legal analysis, but
9 we were involved in developing the crosswalk, which
10 compares the proposed state regulations to the federal
11 regulations. The entire team was part of developing
12 that. And it's also, you know, been subject to EPA's
13 initial review.

14 DR. AMPOMAH: Now, you've been involved
15 in a lot of Class VI applications. Now, do you
16 believe that EPA guidance documents that you heavily
17 relied on in this application is up-to-date?

18 DR. SCHNARR: For the most part, yes.
19 I think those guidance documents were -- were written
20 with the understanding that there may be new
21 technologies. And so the language in there is open-
22 ended enough. I think, in a perfect world, they would
23 be updated all the time, but I think they are still
24 relevant. And I think it's correct to rely on them.

25 DR. AMPOMAH: And as the proposed rule

1 in front of the Commission, do you have that
2 flexibility to more or less incorporate technology --
3 new technology as they become available?

4 DR. SCHNARR: Yes. That was the -- one
5 of our key priorities is to not make the rules so
6 prescriptive and so specific that it would not be able
7 to be flexible enough to account for new technologies
8 and -- and new methods.

9 DR. AMPOMAH: But you are not flexible
10 on the log requirement?

11 DR. SCHNARR: Could you point me to the
12 exact log requirement? Are you talking about the
13 spontaneous potential?

14 DR. AMPOMAH: Yeah. That's a big one.

15 DR. SCHNARR: Again, I'm not an expert
16 in log analysis, but I would say my understanding of
17 that decision is that we were fairly sure that
18 would -- that would trigger a stringency issue with
19 EPA, and that would cause an issue with -- with
20 obtaining primacy.

21 DR. AMPOMAH: Did you try discussing
22 that with EPA or you just decided that once EPA is
23 requiring that, I'm not going to really touch it?

24 DR. SCHNARR: We may have discussed
25 that with EPA. I don't recall, as I sit here, if that

1 specific conversation took place, but --

2 DR. AMPOMAH: Because as Oxy was
3 saying, you do know the limitations that come with SP
4 log. You cannot run SP log when you have air
5 drilling, when you have, let's say, even oil-based mud
6 drilling. So why should not -- so if someone is using
7 air drilling, how are they going to run SP log?

8 DR. SCHNARR: Again, I'm not an expert
9 in SP logs, but I would say I think if this is --
10 it's -- it is reasonable as to -- to bring this up
11 with EPA for their review as an issue.

12 DR. AMPOMAH: Okay. Now, let's talk a
13 little bit about the long-term responsibility as well.
14 I do have some few questions for you.

15 So how is the stabilization of the
16 plume demonstrated than merely just predicted with a
17 simulation model?

18 DR. SCHNARR: And I'll ask a clarifying
19 question. Do you mean as part of the initial permit
20 application or as part of the non-endangerment
21 demonstration at the end of the project?

22 DR. AMPOMAH: Exactly. At the end.

23 DR. SCHNARR: At that stage, it is
24 based on both monitoring and modeling. So the non-
25 endangerment demonstration, I could -- the

1 requirements are -- are listed in here. I could find
2 that, but it -- it is required to account for all of
3 the monitoring data, which would include the plume
4 tracking, which occurs during the injection phase and
5 during the post-injection phase.

6 DR. AMPOMAH: Okay. So you're not just
7 going to rely on someone said, just the modeling, here
8 it is, to just make that decision?

9 DR. SCHNARR: That's correct. The --
10 it's -- it really is, in practice, a combination of
11 the model and the monitoring technologies. The
12 monitoring technologies are limited in some ways to
13 where they can monitor and how often. But the
14 modeling is -- is obviously a construct based on our
15 best understanding of the physics. So when you join
16 the two together, you get the best answer.

17 DR. AMPOMAH: Okay. Yeah. And all
18 these questions are still on the long-term
19 endangerment protection issues.

20 So let me ask, must measured pressure
21 return to a specified level or just declining pressure
22 should be sufficient?

23 DR. SCHNARR: Yeah. The specific
24 language, which I recall pretty specifically, because
25 this is one of the and/or instances, is that pressure

1 has to decline to a level less than what's referred to
2 as the critical pressure. And I can define that.

3 DR. AMPOMAH: Okay.

4 DR. SCHNARR: Or baseline pressure.
5 I'd have to look at the exact edit and how we handled
6 the and/or in this instance.

7 But those are the two pressures that
8 you would be comparing against. But it really is an
9 or in -- in my memory.

10 DR. AMPOMAH: Okay.

11 DR. SCHNARR: It -- it would be less
12 than the critical pressure or less than the pre-
13 injection baseline pressure.

14 DR. AMPOMAH: Now, assuming that there
15 were a lot of uncertainties that were discussed on the
16 cost of the project, and then now we are getting to
17 the end of the project, and they want site closure,
18 how would unresolved uncertainties, legacy wells,
19 faults, or monitoring anomalies be treated at -- at
20 closure?

21 DR. SCHNARR: Can I break that down
22 into sort of component parts?

23 DR. AMPOMAH: Sure. Sure.

24 DR. SCHNARR: So maybe ask me the first
25 part was about the -- the legacy wells?

1 DR. AMPOMAH: Yes.

2 DR. SCHNARR: And do you mean, like,
3 the presence of the legacy wells or if they are
4 leakage pathways or both?

5 DR. AMPOMAH: Or both. Yeah. If there
6 is. And then let's say if there were uncertainties
7 associated with how these -- the corrective actions
8 were more or less implemented. And so it's still hung
9 in there. It's not resolved.

10 DR. SCHNARR: Yeah. In my opinion, the
11 end of the project is when there will be the least
12 amount of uncertainty. At that stage, you would've
13 had several years, if not decades, of data. And one
14 area of increased stringency that the state has
15 proposed is soil gas monitoring. And it's likely that
16 that would be focused on areas of legacy wells.

17 There's above confining zone
18 groundwater monitoring. And if required by the
19 director, there could even be air monitoring. And so
20 at that stage, there would be literally thousands,
21 tens of thousands, of data points to evaluate the --
22 the potential leakage.

23 DR. AMPOMAH: So let's get to site
24 characterization, AoR, and computational modeling.
25 Now, I want to ask you, is it specified in the rule

1 with regards to what minimum site-specific data must
2 be collected before a model can be accepted, rather
3 than relying on original --

4 DR. SCHNARR: There are lists in the
5 rule that I could refer to and read out that do list
6 the types of data that are required to be considered.
7 Yes.

8 DR. AMPOMAH: And that has to be site-
9 specific, not just necessarily, oh, I mean the San
10 Juan basin. So I can use this and I can use that,
11 originally.

12 DR. SCHNARR: Yeah, that's a very good
13 point. And the -- the criteria, in my experience, in
14 my opinion, would be very site-specific and would rely
15 either on core and logs from existing wells or
16 stratigraphic test well. That -- that data's not
17 already available.

18 DR. AMPOMAH: Let me ask you this
19 difficult question about a 3D seismic. Do you believe
20 that it has to be a requirement?

21 DR. SCHNARR: No, I -- I don't.

22 DR. AMPOMAH: In what instance would
23 you say that 3D seismic has to be a requirement?

24 DR. SCHNARR: Well, I -- I do think
25 that's project specific. And so if you're asking me

1 if I was sort of sitting in the -- in the role of the
2 regulator here, what I would require for a specific
3 project? Is that what you mean?

4 DR. AMPOMAH: Or let me even turn it to
5 be like, if let's say a company comes to you, to your
6 company to permit Class VI well for them, what would
7 be your criteria to say that without 3D seismic, I'm
8 not really picking up this case?

9 DR. SCHNARR: Well, I'll caveat this,
10 but -- that I am not a geophysicist.

11 DR. AMPOMAH: Okay.

12 DR. SCHNARR: But I will say that in an
13 area of a high degree of faulting where there really
14 is not very much seismic data, that I would recommend
15 either a high density of 2D seismic or 3D seismic, or
16 other potential technologies that -- again, I'm not
17 the expert, but maybe things like VSP, that there
18 should be some detailed geophysical characterization
19 for the potential presence of faults and also the
20 geologic structure more broadly.

21 DR. AMPOMAH: Now, so that is more of
22 a, let's say, new seismic acquisition. But would you
23 agree that at least the Commission should consider
24 that operator has to search within the basin or the
25 area to see if there is any existence of 2D or 3D

1 seismic, and they have to more or less evaluate those
2 to more or less reducing uncertainty?

3 DR. SCHNARR: I understand that's a
4 very reasonable take. My -- my only concern with that
5 is that there may be limitations on their ability to
6 obtain that data, and other operators may own it and
7 not want to share it. And so, you -- you know, I
8 just -- it starts to flag some concerns I would have
9 that, yes, just because it exists doesn't mean that
10 they would necessarily have the ability to access it.

11 DR. AMPOMAH: Now, you made a point
12 about if you have a concern with, let's say, highly
13 faulted area, definitely the director has a discretion
14 to ask for 3D seismic data. Do you have a fair idea
15 within the two major basins in New Mexico that this
16 could be something that we should look at?

17 DR. SCHNARR: Generally, yes. I -- I
18 do believe that that would be the case in most of the
19 areas of these basins, but --

20 DR. AMPOMAH: Would you say that
21 probably Permian would be more than San Juan?

22 DR. SCHNARR: Getting to -- yeah, I
23 don't want to speak to the specifics of the basins,
24 but that -- that is my understanding.

25 DR. AMPOMAH: Now, based on your

1 experience working on AoR, some people will use
2 pressure. Some people will use saturation. So my
3 question to you is, must the AoR include both
4 projected CO2 plume and the pressure front?

5 DR. SCHNARR: Yes. It's illustrated on
6 my demonstrative yesterday. The operator is required
7 to define the area of the free phase, most likely
8 super critical CO2 plume. And the area of elevated
9 pressure, you know, we've used the word pressure
10 front. That is a site-specific value. And it's
11 subject to usually some review by the agency on how
12 the operator would define that critical pressure and
13 the pressure front.

14 But after that value is decided, the
15 outermost area where over the lifetime of the project,
16 they would exceed that critical pressure. And the
17 area of review is the final outline of -- on both the
18 plume and that pressure front.

19 DR. AMPOMAH: Then let me ask you. So
20 in the particular basin, there is already salt water
21 injection going on there. An operator comes in
22 doing -- want to get a permit to do Class VI wells
23 injection. How do you -- because you want to just
24 isolate the air operations, you know, to calculate the
25 AoR. So how do you incorporate that into what I just

1 asked you in terms of the pressure front and then the
2 CO2 front?

3 DR. SCHNARR: Yes. I've -- I've
4 actually been involved in this exact scenario where
5 there was existing salt water exposal wells in the
6 area of a project that we were working to get
7 permitted. And it would be required that that salt
8 water disposal be represented in the actual model.
9 That would be the first answer. It would be accounted
10 for in the initial baseline pressure.

11 So all -- that -- that baseline
12 pressure, you asked if the data should be site-
13 specific or regional. It -- the -- the baseline
14 pressure is very site-specific, and it should account
15 for previous injection or production activities. And
16 it would be accounted for in the model that would then
17 be used.

18 So it's -- it -- that injection is
19 essentially accounted for in the modeling that also
20 accounts for this injection project. So the final
21 pressures that are calculated account for all of it.

22 DR. AMPOMAH: So in a scenario where
23 your critical pressure, you've not even started
24 injection, but your critical pressure is already
25 above.

1 DR. SCHNARR: Right.

2 DR. AMPOMAH: In what's -- in that
3 situation, how are we going to handle the AoR?

4 DR. SCHNARR: Yeah. I might backtrack
5 your question a little bit. So there's several
6 methods that, for example, are listed in the EPA
7 guidance on how to calculate the critical pressure.
8 And in instances that the -- or what we use the term
9 over-pressured before you even start injecting, there
10 are alternative methods to calculate the critical
11 pressure.

12 And so pretty much by definition, you
13 wouldn't be above the critical pressure. Your
14 critical pressure calculations themselves would take
15 into account the baseline pressure condition. So that
16 would be the approach that would be used.

17 DR. AMPOMAH: So is it OCD position
18 that risk-based AoR will be accepted in the state of
19 New Mexico?

20 DR. SCHNARR: I don't want to speak for
21 OCD on this topic, but I would say that in general, my
22 understanding is OCD is relying on the EPA guidance
23 and that the EPA guidance, as you -- as you know, has
24 a section specifically on risk-based area of review
25 delineation, which is the method used and recommended

1 in this over-pressured case.

2 DR. AMPOMAH: And this discussion is
3 very important because you have -- communities wants
4 to see your entire AoR based on pressure, based on the
5 CO2 plume. But the scenario that we just discussed,
6 they'll probably not see that. So it has to be in the
7 record showing that there are different types of AoR
8 methods. And it could be applicable, especially in
9 some of the basins we have.

10 DR. SCHNARR: Yeah. In my technical
11 opinion, the risk-based area of review methodology is
12 very sound. It's a very detailed analysis. It's
13 actually more detailed and technically defensible.

14 And some of the simpler methods -- the
15 simpler methods are okay when you have an under-
16 pressured situation, but it's analogous to more
17 detailed modeling analyses and other types of
18 environmental programs. And it demonstrates that the
19 pressures at which you would actually have a risk to
20 USDWs.

21 DR. AMPOMAH: Now, in the rule, you
22 talked about -- or even in your testimony, you talked
23 about there has to be a way to account for the
24 displaced brine. How are we going to do that? Or how
25 are operators going to do that?

1 DR. SCHNARR: Maybe you could point me
2 to the exact area of my testimony that you're
3 referring to. I just want to make sure I understand
4 the -- the context of your question.

5 DR. AMPOMAH: Okay. Then let me -- let
6 me ask you my direct question here, and then we'll see
7 if we can pull it up here. But I'm asking you, so how
8 does the model that OCD is going to evaluate account
9 for displaced brine that may move beyond the CO2
10 plume, if that is much clearer?

11 DR. SCHNARR: Yes. So the main issue
12 is that the displaced brine does not -- brine does not
13 move upwards into a USDW, or could cause potential
14 endangerment of a USDW. And so I think that would be
15 the focus of the modeling that would show that the
16 confining system is capable and competent to restrict
17 upwards movement of displaced brines that could
18 endanger a USDW.

19 DR. AMPOMAH: Okay. As you know, some
20 of these models, they do have open boundaries.

21 DR. SCHNARR: Yes.

22 DR. AMPOMAH: You know, semi-open
23 boundaries. So my question is, how will OCD address
24 open or semi-open model boundaries that could
25 artificially suppress predicted pressures?

1 DR. SCHNARR: Yeah. That's actually
2 one of the main questions I have seen coming back from
3 the more detailed modeling reviews.

4 DR. AMPOMAH: Okay.

5 DR. SCHNARR: Is that anytime -- any
6 boundary condition on any model really should be
7 physically based. And so I have seen that question
8 come back on modeling. And I would think that those
9 types of boundaries would have to be justified.

10 The area of review and corrective
11 action guidance that I worked on specifically said --
12 states that there should be testing of the model to
13 ensure that the boundary conditions are far enough
14 away from the injection project that the operator can
15 demonstrate that those boundary's assumptions aren't
16 impacting the results.

17 DR. AMPOMAH: Now, still on that
18 though, does the -- in the rule, does the director
19 have the discretion to request that applicant's model,
20 alternative conceptual geologic interpretations, are
21 not only the one that they prefer?

22 DR. SCHNARR: Yes.

23 DR. AMPOMAH: Okay. We've addressed
24 this one. Now, will OCD -- or would they have the
25 ability to require applicants to obtain pressure and

1 operating data from neighboring operators? Assuming,
2 let's say you have an existing UIC Class VI project
3 going on, and there's a new one coming in. How is the
4 process going to be like?

5 DR. SCHNARR: Yes. I -- I think this
6 is one of the main reasons that's -- that justifies
7 and supports the state getting primacy, is because the
8 state already oversees the other injection projects.
9 And I have experienced this in another state where EPA
10 had primacy on everything.

11 And in that case, EPA essentially
12 required the different operators for the different
13 projects to share certain information so that their
14 respective models could account for the other projects
15 in the area.

16 DR. AMPOMAH: And has it been that
17 smooth?

18 DR. SCHNARR: It actually was fairly
19 smooth. Yes. Yeah.

20 DR. AMPOMAH: Oh, okay.

21 DR. SCHNARR: So we were able to
22 account for their projects. They were able to account
23 for our projects and look at cumulative impacts of --
24 of multiple projects in the same general area, if
25 that's what your question is.

1 DR. AMPOMAH: Yeah.

2 DR. SCHNARR: Yeah.

3 DR. AMPOMAH: So I'm just asking that
4 we don't necessarily need anything in the rule to
5 account for that, to give OCD that authority to really
6 instruct companies to more or less be more
7 transparent.

8 DR. SCHNARR: Yeah. I -- I -- that I
9 probably would want to defer a little bit more to OCD
10 in their practice because -- and how they handle that
11 in other well classes.

12 DR. AMPOMAH: Okay. Because I do know
13 that there are instances where a company will tell
14 you, "I spent millions of dollars to buy my 3D
15 seismic. I'm not giving this out."

16 DR. SCHNARR: Well, you -- I'm sorry.
17 To clarify, you -- I thought you were specifically
18 asking about pressure data.

19 DR. AMPOMAH: Exactly. Exactly.

20 DR. SCHNARR: So I -- I -- my answers
21 are all really specifically on pressure because that
22 is sort of the most likely cumulative impact is -- is
23 these pressure areas kind of interacting with each
24 other. I -- I was not speaking to sharing proprietary
25 seismic data.

1 DR. AMPOMAH: Yeah. But I'm just
2 saying that so in this rule, do you believe that OCD
3 do have the authority to at least even tell the other
4 companies, these are this information that you need to
5 share with the other party? And even it's counter
6 sharing; right? So that everybody will know what each
7 of -- each party is doing?

8 DR. SCHNARR: I -- I may defer a bit to
9 OCD on what they are required to share, but I will say
10 that the pressure data they collect is required to be
11 reported to the agency. I believe it's in quarterly
12 reports. But they have -- they will have monitoring
13 reports of all their monitoring data that would
14 include their injections on pressure data. So OCD
15 themselves should have that pressure data

16 DR. AMPOMAH: Then let me ask
17 Mr. Wrinkle. So would OCD, without permission from
18 the other party -- you know, in the rule, I don't
19 think there's any protection there. So I'm just
20 probing to see if there has to be something there to
21 give OCD that authority?

22 MR. WRINKLE: So --

23 MR. TREMAINE: Well, Commissioner, I
24 don't think that Mr. Wrinkle -- I -- I'm not sure the
25 context of your question. So I don't think that

1 Mr. Wrinkle is able to testify as to whether or not
2 OCD could legally compel the disclosure of a
3 proprietary piece of information. That's a different
4 question.

5 So if you're asking about 3D modeling
6 that is labeled as proprietary, that requires a legal
7 analysis that Mr. Wrinkle could not answer. If it's
8 about something else that's more specific within the
9 custody of control or the normal investigation
10 authority, inspection authority of the OCD, that would
11 be something that we could get, so it depends.

12 DR. AMPOMAH: Yeah. This -- so this
13 one will be specifically to the pressure, you know,
14 but I just threw in the seismic for just illustration
15 purpose. But it's the pressure.

16 Because let's say you have one company
17 coming in. They already inject it. The other company
18 is coming in. They need to look at the cumulative
19 effect, you know? So I'm just looking at the legal
20 authority that OCD will have to make that happen.
21 Yeah.

22 MR. TREMAINE: You said the magic words
23 "legal authority," Commissioner, so I don't --

24 DR. AMPOMAH: Okay.

25 MR. TREMAINE: I really --

1 DR. AMPOMAH: Okay. Let me pause
2 there.

3 MR. TREMAINE: I try not to object to
4 any Commissioner questions, but he can't answer that.

5 DR. AMPOMAH: Let me pause there.
6 Okay.

7 MR. TREMAINE: I think the issue is
8 whether we're just talking about data. And it really
9 becomes a question about whether is -- whether with
10 the data that's submitted, OCD may have options to
11 compel or share data. But is there -- is the permit
12 adequate absent that data? They're two different
13 questions.

14 DR. AMPOMAH: Oh, then you open up
15 another --

16 MR. WRINKLE: I -- I can answer in an
17 analogical kind of -- kind of way without legal
18 interpretation.

19 BY DR. AMPOMAH:

20 DR. AMPOMAH: Okay.

21 MR. WRINKLE: So, you know, when --
22 I -- I hope I don't butcher this and my compulsory
23 pooling team isn't watching me. But basically, if an
24 applicant comes in and you already have a neighbor,
25 right, that is already, you know, active with a --

1 with a permit and doing something, you know, we would
2 definitely point them to public information; right?
3 That -- that they submit to us, either quarterly,
4 monthly, whatever that may be, injection pressures
5 and -- and whatnot.

6 But basically, you know, if you gave,
7 say, the authority to the OCD to go to essentially
8 their competitor, possibly; right? And say, you have
9 to give up this information so their permit is -- is
10 legit, I don't think -- I think most -- the most that
11 OCD would do in this circumstance, kind of like we do
12 in the compulsory healing world, is you guys go talk
13 amongst yourselves. And if you come up with a deal
14 and this -- this company is willing to share whatever
15 that information is that OCD doesn't collect as
16 public, then by all means do so. If not, then, you
17 know, I -- I don't really have an answer if not;
18 right?

19 DR. AMPOMAH: Okay.

20 DR. SCHNARR: I guess I could clarify a
21 little bit. Some of this information is publicly
22 available on the Class VI permit applications
23 themselves. So that's why when you asked if it was
24 that smooth, it's because the anticipated pressures
25 were available and injection rates for other projects

1 so they could be incorporated into the modeling.

2 DR. AMPOMAH: Okay.

3 MR. WRINKLE: And Mr. Eales has a --
4 has a comment as well.

5 MR. EALES: And I'll just add one
6 further data point. The OCD for -- for current
7 injection wells requires operators to submit a monthly
8 C-115 showing their volumes and pressures in that
9 well. That's public available information that
10 anybody can pull from and inform their permit.

11 DR. AMPOMAH: Thank you. So
12 Dr. Schnarr, let's go back -- let's get back. And let
13 me ask you this. What monitoring results would cause
14 OCD to conclude that original AoR is no longer valid?

15 DR. SCHNARR: Would trigger an AoR
16 reevaluation?

17 DR. AMPOMAH: Yes.

18 DR. SCHNARR: I would want to point to
19 the exact regulatory text, but I -- I do believe it's
20 not quantitative in the regulations, but that it is a
21 significant deviation between the observed pressures
22 and the monitored pressures, and the location of the
23 plume and the modeled location of the plume at that
24 time frame would be two key considerations.

25 DR. AMPOMAH: And you still stand by

1 the fact that you believe that it has to be two-year
2 initial review and then four years recurring of the --
3 of the AoR?

4 DR. SCHNARR: Well, that was in working
5 with OCD. That was a decision that was made to be
6 more stringent. And as someone who's, you know,
7 worked on a lot of these, I -- I agree. It's a very
8 reasonable ask. And to be more protective and have an
9 earlier viewpoint, I would say even the EPA has a
10 default minimum time frame. So there is something
11 that's a little subjective about any time frame. And
12 just to be -- have something that's sooner than five
13 years, I agree with.

14 DR. AMPOMAH: Now, in the application,
15 there are a lot of usage of material change --
16 material change in the application. When I say the
17 application, I mean, the rules. So 41, 42, 43. What
18 constitutes a material change in injection rate,
19 volume, pressure, or CO2 composition?

20 DR. SCHNARR: This would be defined in
21 the AoR corrective action plan of that specific
22 project.

23 DR. AMPOMAH: Okay.

24 DR. SCHNARR: If it's about AoR
25 reevaluation, for example. Those specific

1 quantitative criteria would be defined for each
2 project. And it could also be covered in guidance of
3 what would cause a material change.

4 DR. AMPOMAH: So in your case -- in
5 this case, you're saying that that has to be covered
6 in the permit application. So if, let's say, an
7 applicant goes beyond that, then it triggers?

8 DR. SCHNARR: It's -- it's a part of
9 the permit application. And ultimately, if the permit
10 is issued, it is a -- a condition of the permit
11 itself.

12 DR. AMPOMAH: Okay. Now, what
13 corrective action is required when pressure fronts
14 expands beyond the approved AoR, but there's no
15 contamination?

16 DR. SCHNARR: If the pressure front, as
17 we call -- we -- we discussed, it could be defined in
18 different ways. So for that project, if the pressure
19 front expanded, the area of review expanded,
20 corrective action would be required in that area by
21 definition.

22 DR. AMPOMAH: But it would not really
23 require, let's say, a shutting or something like that?

24 DR. SCHNARR: I think that would be a
25 project-specific determination. I will say that the

1 Class VI framework does allow for what's called phased
2 corrective action, which means that there can be areas
3 that the pressure front may not reach for 10, 15, 20
4 years. And you don't -- you aren't necessarily
5 required to perform corrective action on all areas
6 within the area of review prior to injection.

7 There is an allowance for phasing that
8 in, focusing on the area closest to the injection
9 wells first, and doing the areas furthest away from
10 the injection wells at a later time.

11 DR. AMPOMAH: Let's go to test and
12 monitoring a model verification. Must each monitoring
13 technology be tied to a stated detected threshold and
14 spatial and temporal resolution?

15 DR. SCHNARR: Do you mean in the
16 regulation or in a permit application?

17 DR. AMPOMAH: In a permit application.

18 DR. SCHNARR: There is a requirement to
19 just -- to put that information in the permit
20 application. There's a -- an appendix to the testing
21 and monitoring plan called a quality assurance and
22 surveillance plan, where the resolution and the
23 detection limit are disclosed for every single
24 monitoring technology for review by the -- in this
25 case, the OCD.

1 DR. AMPOMAH: So the permit applicant
2 is going to more or less present this to OCD. Now,
3 let me ask, how will OCD determine whether a
4 monitoring network can detect an adverse condition
5 before it more or less reaches the USDW?

6 DR. SCHNARR: That would be based on
7 the monitoring within the injection zone and above the
8 confining zone. And it would be based on both the
9 presence and the location of those monitoring points
10 and the detection limits that you are asking about.

11 DR. AMPOMAH: Now, I know this has been
12 discussed, but I don't know if there was a concrete
13 answer provided to this. So what baseline groundwater
14 formation fluid and soil gas data are necessary before
15 injection?

16 DR. SCHNARR: The rule -- I'll take
17 that in its component parts. So I think you said
18 baseline groundwater first.

19 DR. AMPOMAH: Mm-hmm.

20 DR. SCHNARR: The pre-operational
21 testing requirements in the rule do list that fluid
22 data has to be collected during the drilling of the
23 injection well itself. And that would typically
24 include verification of the salinity of formations to
25 verify the depth of the lowermost underground source

1 of drinking water. That would be one type of baseline
2 data.

3 Typically -- and then anything beyond
4 that, I think would get beyond the -- including in
5 soil gas would get beyond the rule text and would go
6 more into guidance and project-specific oversight.
7 But in general, there is a baseline. Well, do you
8 want me to continue or does that answer your question,
9 Commissioner?

10 DR. AMPOMAH: No, it does in the sense
11 that you're telling me that at least some of it has to
12 be collected during the drilling, like, formation
13 fluid. But others, more or less, can be determined
14 through guidance.

15 DR. SCHNARR: Yes. Guidance and -- and
16 I would also add project-specific oversight.

17 DR. AMPOMAH: And that -- would that
18 mean that it has to be a discussion with the director
19 to more or less come to consensus as to what will
20 establish the baseline?

21 DR. SCHNARR: A discussion with the
22 director as -- and reflected in the plans and the
23 final permit, yes.

24 DR. AMPOMAH: Okay. Now, so you said
25 monitoring wells has to penetrate into the injection

1 zone. You gave two monitoring wells potential. One
2 would be upper zone, and then one will be within the
3 reservoir itself. Can you explain to the Commission
4 why the monitoring well within the injection zone is
5 really necessary?

6 DR. SCHNARR: There are requirements in
7 the Federal Class VI Rule for monitoring, direct
8 monitoring of pressure within the injection zone. And
9 so really the only way to do that, that I'm aware of,
10 would be dedicated injection zone monitoring well for
11 monitoring pressure at some distance away from your
12 injection well.

13 DR. AMPOMAH: So don't you believe that
14 you can have, let's say, a well drill into the
15 mostly -- probably would be the -- the caprock, but
16 you do not really enter into the injection zone. And
17 you do have a pressure gauge that can point into the
18 injection zone. Are you familiar with something like
19 that?

20 DR. SCHNARR: The pressure gauge itself
21 is in the injection zone?

22 DR. AMPOMAH: You know, they -- they are
23 able to implement to -- to be able to install it in
24 such a way that the readings that will be coming out
25 will be right from the reservoir without actually

1 getting into the reservoir itself. I don't know if
2 Matt knows that, that he can comment on that.

3 MR. EALES: Yeah. I'm familiar with
4 bottom-hole tests where you can stop injection and
5 allow time to settle and read the actual pressure at
6 the bottom of the well. So is that what you're
7 referring to? Within the existing injection well?

8 DR. SCHNARR: Well, this is -- well,
9 this would be continuous. I'm sorry. And I'll
10 clarify. The -- the requirement is for continuous
11 monitoring of pressure, I believe.

12 DR. AMPOMAH: So we've done some
13 projects where you do have a monitoring well, but that
14 monitoring well really doesn't go straight into the
15 operational zone. But you are still able to implement
16 the monitoring strategy to get the data from the
17 injection zone, or the production zone.

18 Because I'm more concerned about if we
19 drill a monitoring well through injection zone, and we
20 get through what next. I mean, that -- that
21 monitoring well becomes a potential for leakages.

22 DR. SCHNARR: Right. In the preamble
23 to the initial Federal Class VI Rule, EPA has a pretty
24 detailed discussion of that concern because there were
25 commenters at the time who said there should be ten

1 injection zone monitoring wells.

2 And so what EPA said was that there was
3 a concern of leakage from injection zone monitoring
4 wells, so they should be limited in number.

5 I can't speak personally to the
6 technology that you are referring to. And I -- I
7 think that it would be up to OCD to determine if that
8 fits the definition of direct pressure monitoring in
9 the injection zone. And if it did, then that would be
10 great.

11 DR. AMPOMAH: So then would you agree
12 that if an operator is able to prove that my
13 technology -- because for sure, you still have the
14 measurement in the injection well, right, there too;
15 correct? So if an operator is able to prove that I'm
16 not -- I'm not going to drill straight into the
17 injection zone, but I'm still going to be able to use
18 technology to get the pressure measurements within the
19 injection zone, should the director consider such --
20 such request? Okay.

21 MR. WRINKLE: Okay. So -- so we -- we
22 do the -- we do this with different cements, different
23 technologies where -- where we do, you know, the --
24 the operator can come in and the applicant and say,
25 we -- "Instead of penetrating the injection zone for

1 continuous monitoring, we have this new technology
2 that does as good or better. And here's" -- and they
3 present it to us, and then we -- we make a decision
4 from there. So -- so it wouldn't be a new process
5 for -- for OCD.

6 DR. SCHNARR: I'll answer your
7 question. I'll say yes.

8 DR. AMPOMAH: Okay. Now, do you know
9 any direct measurement, any direct tool, that can give
10 us the actual pressure front without doing the
11 modeling?

12 DR. SCHNARR: Well, as I explained,
13 it -- it really -- you have to marry the monitoring
14 data you have, which is limited in -- by its nature to
15 certain locations with a model that is calibrated to
16 that data. And -- and that's the best way to have a
17 firm understanding of your pressure front.

18 DR. AMPOMAH: Okay. Now, this is a --
19 this is a difficult one because let's say you've
20 permitted a well and they showed you the area or
21 footprint. And now the plume is moving away from the
22 footprint that they want to show you that they have
23 control over, and the new landowner is saying, "No,
24 I'm not going to allow you to come and monitor," even
25 though the plume has moved. Is there any guidance,

1 you know, as to how OCD is going to handle such
2 situations?

3 DR. SCHNARR: And I'll just reiterate,
4 make sure I understand the scenario. So in this case,
5 after some years of -- of monitoring, the plume is
6 moving in a different direction or a different
7 location, and the operator doesn't have land access
8 for monitoring wells?

9 DR. AMPOMAH: Yes.

10 DR. SCHNARR: In that case, the
11 operator in -- in this framework, my understanding,
12 would be required to do an AoR reevaluation. And also
13 an area of increased stringency that OCD has proposed
14 is also a reevaluation of the testing and monitoring
15 plan. And if they, in this instance, were not able to
16 develop a testing and -- you know, an implementable
17 testing and monitoring plan for approval by the
18 director, that -- that may cause some problem with the
19 project continuing.

20 DR. AMPOMAH: Okay. So I asked
21 Dr. Wang about interference test. Now, through this
22 rule, you are also supporting area permits where --

23 DR. SCHNARR: I'm sorry. Go ahead.
24 I'll let you finish your question.

25 DR. AMPOMAH: Okay. So in instances

1 where you do have multiple wells within, let's say, a
2 single AoR, I'm just asking, at what point should
3 interference test be a requirement?

4 DR. SCHNARR: Yeah. And I'm sorry,
5 just to be clear, area permits are prohibited in the
6 Federal Class VI rule, and they would not be allowed
7 in the state program because of that, even if it was
8 desired. So there are no area permits for Class VI.

9 And so although -- and it -- I know
10 it's a -- it can be a little confusing because you can
11 have projects with multiple injectors. In that case,
12 each injection well receives its own permit, but each
13 of those injection wells needs to consider all of the
14 injection from all of the other wells in their plans.

15 So the modeling has to consider it.
16 The monitoring strategy has to consider that. But
17 officially, each -- each well actually gets its own
18 permit. It's not an area permit.

19 DR. AMPOMAH: Yeah. You -- you use
20 that area permit to cover my question. So let me --
21 let me rephrase my question.

22 DR. SCHNARR: Okay.

23 DR. AMPOMAH: Now, if you have multiple
24 wells within a single AoR, or let's say a project, at
25 what point will OCD make interference test a

1 requirement?

2 DR. SCHNARR: And by interference
3 testing, you mean, like, understanding the cumulative
4 impact from injection from all these different wells?

5 DR. AMPOMAH: Exactly.

6 DR. SCHNARR: I -- I -- well, it would
7 definitely be -- I'm trying to -- you know, I -- I
8 don't know how much this is spelled out in the rules.
9 It's definitely in the guidance. But in practice, all
10 of those wells and all of the injection from their
11 project would -- would have to be included if it's in
12 the same area of review. There's no question.

13 And if there was salt water disposal,
14 other activities in the general area, that would
15 typically be required.

16 And when I mentioned my experience in a
17 different state, there was three separate projects.
18 They didn't have overlapping area of reviews, but they
19 were in the same general vicinity. And I can get into
20 more detail on -- but in that case, all of the wells
21 from all the different projects had to be considered
22 in the modeling to inform the area of review for all
23 the different projects.

24 DR. AMPOMAH: Yeah. But -- so let's
25 say we are not really mandating interference testing,

1 but there is a situation where the director has to
2 have a discretion to mandate that based on what you
3 just described.

4 DR. SCHNARR: Yeah. I would just --
5 the only thing I would say I agree with you is -- is
6 that I just -- be sure we define what we mean by
7 interference testing.

8 DR. AMPOMAH: Okay.

9 DR. SCHNARR: But -- because in my kind
10 of language, I -- I think of that as understanding the
11 cumulative impacts.

12 But I do agree with you that the
13 director should have the discretion to evaluate the
14 cumulative impacts for multiple wells injecting in the
15 same area. And I'm not sure that needs to be in the
16 rules or it can be left to guidance.

17 DR. AMPOMAH: Then let me add and ask
18 that must the test design interpretation be
19 independently reviewed by OCD before the results are
20 accepted?

21 DR. SCHNARR: The test design, in my
22 mind, this is just the same kind of AoR modeling, but
23 accounting for the other projects. And it would be
24 subject to OCD review. Yes.

25 DR. AMPOMAH: We are after four now.

1 Do I still continue or we can pick it up --

2 THE HEARING OFFICER: Yes.

3 DR. AMPOMAH: Okay. Well, let me
4 finish, probably let me --

5 MR. CHANG: I just want to confirm.
6 There's no 4 p.m. public comment today?

7 THE HEARING OFFICER: No, Mr. Chair.

8 MR. CHANG: Okay.

9 THE HEARING OFFICER: The first day was
10 four, and then every subsequent day is nine.

11 MR. CHANG: Just nine. Okay.

12 DR. AMPOMAH: But just in case you are
13 tired, I mean we can.

14 DR. SCHNARR: I'm fine.

15 DR. AMPOMAH: Okay. But there -- but
16 I'm not going to finish today.

17 DR. SCHNARR: That's great.

18 DR. AMPOMAH: Yeah.

19 DR. SCHNARR: Sounds good.

20 DR. AMPOMAH: Okay.

21 BY DR. AMPOMAH:

22 DR. AMPOMAH: Now let's get into the --

23 MR. CHANG: Would you like to take a
24 break? If --

25 DR. AMPOMAH: No, I can go, but I feel

1 like it's been a -- a long afternoon but --

2 MR. CHANG: I mean, I don't mind
3 continuing until five. But do people need a bathroom
4 break or anything like that?

5 DR. AMPOMAH: Till five.

6 MR. TREMAINE: I -- I've got half of my
7 panel would like a bathroom break, so.

8 THE HEARING OFFICER: All right. Let's
9 come back at 4:20, please.

10 (Off the record.)

11 THE HEARING OFFICER: It's like greet
12 your neighbor at church. It's hard to come back.

13 All right. Commissioner Ampomah, do
14 you have additional questions of this panel?

15 DR. AMPOMAH: Yes, I do. And I'm going
16 to switch over to the legacy abandoned and
17 unidentified wells. So this one will still be for
18 Dr. Schnarr on this one.

19 BY DR. AMPOMAH:

20 DR. AMPOMAH: Now, let me ask, what
21 sources must be searched -- what sources must be
22 searched to identify wells and other artificial
23 penetrations? Is it only OCD records? Or it has to
24 also contain water well records, federal records,
25 historical maps, aerial imaging -- imagery, landowner

1 interviews, and do physical surveys?

2 DR. SCHNARR: You know, it might take
3 me a minute, but I'm -- I might be best to actually
4 find the rule text in general. It -- if you're
5 talking about wells that may penetrate the confining
6 zone, it's usually -- yeah. Maybe the best thing is
7 to find the actual citation, but typically it would be
8 the state databases and internal records of that
9 company if they are in that area. And in -- if
10 required by the director, additional searches outside
11 of that.

12 DR. AMPOMAH: Oh, as required by the
13 director. Additional searches?

14 DR. SCHNARR: Yes.

15 DR. AMPOMAH: Okay.

16 DR. SCHNARR: Yeah. There -- there is
17 language in there that I'm paraphrasing that if
18 required by the director, there may be a requirement
19 for physical well searches.

20 DR. AMPOMAH: Now, are there any
21 guidance for the director in terms of determining if
22 the well search is sufficiently complete?

23 DR. SCHNARR: Yes. There is guidance
24 in the EPA area of review and corrective action
25 guidance on this topic.

1 DR. AMPOMAH: Now, can a permit be
2 issued where the applicant cannot physically assess or
3 evaluate every potential affected legacy well?

4 DR. SCHNARR: In my understanding, if
5 there are known wells that cannot be assessed, that --
6 that may be a problem for issuing a final permit.

7 DR. AMPOMAH: Now, must corrective
8 action be completed before injection, or it can be
9 phased?

10 DR. SCHNARR: As I spoke about before
11 the break, there is an allowance for phased corrective
12 action. Again, that's under the oversight of the
13 director.

14 DR. AMPOMAH: The director.

15 DR. SCHNARR: But yes, the -- the Class
16 VI framework does allow for phased corrective action,
17 I believe.

18 DR. AMPOMAH: Okay. Now, there has
19 been a discussion about the -- and this one will be
20 the plugging post-injection site care closure, this
21 particular question.

22 There has been a discussion about the
23 PISC period should be shortened. Or more or less go
24 for the 50 years. May the post-injection care period
25 be shortened? And -- but -- but my question here is,

1 what burden of proof applies here?

2 DR. SCHNARR: There are actually
3 specific criteria that are listed in the proposed rule
4 that mirror the federal rule. From memory, it -- it
5 has to -- you know, you need to evaluate the distance
6 between the injection zone and the lower most USDW,
7 the competence of the confining system, the projected
8 time frame for pressure decline, and the projected
9 rate of plume migration after injection ends. Those
10 would be four of the key things that you would look
11 at.

12 But it's actually in the regulation,
13 these specific criteria. I don't believe that was
14 every single one of them that must be evaluated in
15 this alternative post-injection site care time frame
16 application.

17 DR. AMPOMAH: Now, one thing that I'm
18 still struggling to -- to really agree to is the fact
19 that this alternative PISC period has to be part of
20 the initial application. Do you still believe that?

21 DR. SCHNARR: Well, it's not required
22 to be part of the initial application. It's the
23 operator's choice to do that. So the operator has the
24 option of, if -- if they don't believe the 50 years is
25 applicable to their project, to, as part of their

1 initial application, recommend a shorter time frame
2 based on the criteria. And then it would be up to the
3 OCD to approve or deny that -- that request.

4 DR. AMPOMAH: And do you believe that
5 the director should even consider this, even prior to
6 you issuing the permit in the first place?

7 DR. SCHNARR: Yes. I -- I can speak to
8 this with some experience because I was actually part
9 of the team that came up with the 50 years when I was
10 at EPA. And it was based on modeling studies, which
11 was all that was available at the time. And it -- it
12 assumed at the time, we envisioned that most Class VI
13 projects would be injecting for 40 or 50 years, and
14 associated with clean coal projects.

15 And the shorter duration injection
16 projects, many now are recommend -- are -- are
17 proposing 12 years of injection. I do think it's very
18 reasonable to -- to have a -- a shorter default time
19 frame. And that's why that flexibility was written
20 into the original rule, and I would maintain it.

21 DR. AMPOMAH: Okay. Let me ask some
22 few questions on the financial assurance. And if it's
23 beyond your abilities, you just say, "Pass." Yeah.

24 Now, in putting together that financial
25 assurance, what activities, or let's say worst case

1 scenarios, must be included in the cost estimate?

2 DR. SCHNARR: The cost estimate is
3 required to be broken down into several different
4 components. So one is corrective action. One is
5 injection well plugging. One is post-injection site
6 care monitoring. And one is emergency and remedial
7 response. And I think that your question is related
8 to the last one.

9 And it really is tied to that
10 applicant's emergency and remedial response plan. But
11 in general, it would be activities to remediate,
12 address, mitigate groundwater contamination, and other
13 contamination events that could occur.

14 DR. AMPOMAH: Now, would you agree --
15 or let's say must the estimate assume a third party
16 completion rather than that of the operator's internal
17 cost? How should we -- you know, how should OCD look
18 at the cost that has been proposed?

19 DR. SCHNARR: I have developed these
20 cost estimates myself many times. And I -- if I was
21 reviewing it on the other side, I would be looking at
22 the unit costs. If it's just some guesstimate with no
23 reference, or if it's, like, from a local vendor, if
24 you're looking at things like monitoring well or
25 remediation well, drilling, or water treatment

1 technologies, I would hope that it would be something
2 that is -- they went to the effort of getting
3 something that was project and -- and location
4 specific and has references.

5 It is required to be done by a third
6 party, not the operator themselves. But that's what I
7 would be looking for. And the assumptions. So does
8 this really cover all of the emergency activities that
9 are potentially an issue with this project?

10 And so for example, it may look very
11 different for a project that is located near a more
12 highly densely populated areas. It may be very
13 different for areas that are dependent on groundwater
14 as a sole resource.

15 So there should be area-specific
16 considerations that are taken into account in the
17 broader assumptions. And, again, I would go back to
18 the actual unit costs as well.

19 DR. AMPOMAH: And then you said that
20 there has to be a reference associated with the cost?

21 DR. SCHNARR: Yes. Yeah. Yeah, that's
22 correct. It's a third-party requirement. And I
23 would -- if I was reviewing it, I would hope that the
24 third party -- I would require it that they -- the --
25 the -- they bring their receipts, that this isn't just

1 a guess of what something might cost.

2 DR. AMPOMAH: Now, should there be any
3 contingency percentages on top of the estimates?

4 DR. SCHNARR: I think that would be at
5 the discretion of the director.

6 DR. AMPOMAH: Okay.

7 DR. SCHNARR: But it's -- it -- it
8 would be a reasonable question.

9 DR. AMPOMAH: Now, how do stream
10 impurities affect the plume behavior, density, phase
11 behavior, geochemistry, and AoR modeling?

12 DR. SCHNARR: So the operator is
13 required to disclose what their stream characteristics
14 will be. It may be a range. And that is a permit
15 condition. And they are subject to monitoring the
16 stream periodically.

17 And then they are required to perform
18 really two types of modeling activities. One is a
19 geochemical suitability analysis. And it's
20 demonstrating that the inject date is compatible with
21 both the injection zone and the confining system.
22 It's not going to lead to a loss of containment. And
23 that analysis needs to take into account the presence
24 of these potential impurities. And also the area of
25 review modeling.

1 If -- if the -- if in the discretion of
2 the director and the technical reviewers, those
3 impurities could have some impact on the plume
4 migration. I think typically in those cases, it's
5 not, like, fully reactive transport modeling, but it
6 may be a more simplified consideration of these
7 impurities that would be acceptable. And the last --
8 yeah, I think I would leave it at that. Yeah.

9 DR. AMPOMAH: Yeah. So is it your
10 testimony that the model must use a representative
11 range of anticipated compositions rather than just a
12 single composition?

13 DR. SCHNARR: Yes. But I would not be
14 so specific that it has to be a fully reactive
15 transport model that has, like, a specific numerical
16 representation of every chemical. There may be a -- a
17 way of -- of -- it's 94 percent CO₂, 6 percent
18 hydrocarbons. So there are ways in the modeling to
19 simplify it that I think are acceptable and typical in
20 the industry.

21 DR. AMPOMAH: So this will be something
22 that could be added to the AoR session where we talk
23 about the sensitivity and then also the internal
24 analysis?

25 DR. SCHNARR: That's exactly right.

1 And that is what is standard.

2 DR. AMPOMAH: Okay. Thank you. Okay.
3 I believe I'm done with you. So I'm going to move on
4 to Mr. Matt Eales. So I don't know if I can continue
5 or we -- we pick it up in the morning.

6 THE HEARING OFFICER: What is your
7 preference?

8 DR. AMPOMAH: I do not have any
9 preference. I can move, but should I?

10 MR. CHANG: Go for it.

11 DR. AMPOMAH: Okay. But at least check
12 the time for me. Once it's five, then we're done.

13 THE HEARING OFFICER: Mm-hmm.

14 BY DR. AMPOMAH:

15 DR. AMPOMAH: Thank you, sir, for your
16 testimony. So I'm going to start with the well
17 construction, casing, and cement corrosion questions.

18 Now, what design life must casing and
19 cement meet?

20 MR. EALES: For the life of the well.

21 DR. AMPOMAH: For the life of the well.
22 What about -- oh, for the -- explain a little bit
23 more.

24 MR. EALES: Yeah. So that's a good
25 question. So the -- it's for the life of the well,

1 and it's also through the post-injection time period.
2 Ensure that it's -- maintains integrity through that
3 entire time period.

4 DR. AMPOMAH: Now, how will OCD verify
5 that the well -- the -- the materials, you know, meet
6 that criteria that you just described?

7 MR. EALES: So as Dr. Schnarr just
8 pointed out, one of the obligations of the rule is for
9 the operator to present the characteristics of the
10 inject date itself and its corrosive properties.

11 And so using that data, the operator
12 then has to present to the OCD that that particular
13 inject date is being handled so the well design is
14 appropriate to that inject date for that life of that
15 well. So that would be alloys, special alloys, or
16 special cements, if necessary, with any area that's in
17 contact with the CO2.

18 DR. AMPOMAH: Now -- so what kind of
19 changes in the CO2 composition that might more or less
20 require a renewal compatibility testing, or let's say
21 permit modification?

22 MR. EALES: So if there's any
23 significance in that -- in that change in that inject
24 date, then that has to -- we have to reevaluate.

25 So if you -- if you see a change, as

1 was referred to earlier in prior testimony, in that
2 inject date, then you do have to reanalyze the alloys
3 in the cements.

4 DR. AMPOMAH: But there is not a
5 quantitative description with regards to what kind of
6 change would trigger that?

7 MR. EALES: That's correct.

8 DR. AMPOMAH: So it's still at the
9 discretion of the director?

10 MR. EALES: It is. And in history with
11 the OCD, typically, they'll show a 1 or 2 percent
12 change in the inject date itself. So it is at the
13 discretion.

14 DR. AMPOMAH: Oh, okay. Now, when will
15 cement bond, ultrasonic, and other evaluation logs be
16 mandatory?

17 MR. EALES: Okay. So they're required
18 in a few spots within the rule. With the surface
19 casing itself, the -- the logs are required on the
20 formation to ensure that you're below these -- the
21 water, and you're into the containment zone below that
22 water when you set the surface casing.

23 As well, it's called out specifically
24 on the production string, or the casing that goes to
25 the bottom, to also assess the particular containment

1 zone that you're going into and -- and the area in
2 that -- because that's such a sensitive area. So the
3 logs are required for that, and it's a certain type of
4 log.

5 Also within the rule, when you are
6 placing intermediate casing, or any other layers of
7 casing, you're obligated to perform casing cement bond
8 logs. It doesn't call out the actual type, but it
9 does spell out that you're required to perform logs to
10 verify that you had good cement, you had good radial
11 cement bonds, and you don't have any channeling within
12 that casing.

13 DR. AMPOMAH: It is interesting because
14 you triggered one more question.

15 MR. EALES: Yes.

16 DR. AMPOMAH: Now, so in the rule, as I
17 read, you're saying that the surface casing is a
18 requirement, and then one more string, at least one
19 more string.

20 MR. EALES: Yes. On -- for the
21 formations.

22 DR. AMPOMAH: So now let's take San
23 Juan basin as an example. Now, what that same
24 criteria holds, when you have depleted, massive,
25 depleted zones, within the area, and you are just

1 saying that, okay, just put only one surface and not
2 go straight into the surface complex. Is that
3 really -- would that -- I mean, is that safe enough to
4 do?

5 MR. EALES: No. And if I understand
6 the question, the way it's written now is the
7 surface -- the surface casing has to be able to prove
8 it's below the -- I'm not sure I'm understanding the
9 question, so maybe if you could reiterate.

10 DR. AMPOMAH: Okay. Let me -- let me
11 break it down.

12 MR. EALES: Yeah.

13 DR. AMPOMAH: Now, in the rule, we are
14 requiring at least two string; surface, and then
15 another long-string through the injection zone; right?

16 MR. EALES: Correct.

17 DR. AMPOMAH: So my question is about
18 the intermediate.

19 MR. EALES: Yes.

20 DR. AMPOMAH: So in the San Juan basin
21 where we have all the production zones, mostly
22 depleted, most -- most of -- some of them depleted, if
23 we require only one single, let's say, surface, no
24 intermediate, and go straight into the -- the storage
25 complex, do you believe that we are protecting the

1 USDW?

2 MR. EALES: No, I don't -- I don't
3 believe so in that situation. And it's covered and
4 contemplated in the rule through the tensile burst
5 strings and in the casing strings itself, and the
6 ability to cement.

7 So if you're going very deep -- and
8 most of my experience, of course, is in Permian. But
9 if you only have one production casing, let's say, for
10 an 18,000 foot well, you will not get cement to the
11 surface. You will not be able to protect the -- the
12 integrity of the well.

13 So another section within construction
14 talks about the integrity of the well, or the
15 construction has to be robust in such a manner that it
16 can, number one, have good cement behind the casing.
17 And it can also protect from the formation behind that
18 casing also.

19 And -- and have the structural
20 integrity as -- you know, a 7-inch production casing
21 won't be able to go to bottom by itself without other
22 layers to provide that protection.

23 DR. AMPOMAH: Let me ask. And this
24 one, Dr. Schnarr, can also chime in on this. So it's
25 a requirement that the production casing has to go

1 through the storage complex for this rule. Is that
2 correct?

3 MR. EALES: That I can't answer. Do
4 you know that answer?

5 DR. SCHNARR: I'm in the same boat. I
6 would want to look at the rule.

7 MR. EALES: I would need to look at it.
8 I'm not sure that's a requirement.

9 DR. AMPOMAH: So is it not -- it's not
10 required. I mean, you said you have to have -- in the
11 rule, definitely you have to have the surface casing.
12 And then another long-string that goes all the way to
13 the injection zone. So you can crosscheck and see if
14 that is correct or not.

15 MR. EALES: Yeah. I believe it goes to
16 the containment layer, but not required to go through
17 the injection zone. But let me check.

18 DR. AMPOMAH: Please do. Because for
19 sure, EPA, you have to go through that.

20 MR. EALES: I just don't remember
21 seeing that, but we'll keep looking.

22 DR. SCHNARR: So Matt, I'll just help
23 you find it if that helps.

24 MR. EALES: Please, yes.

25 DR. SCHNARR: You're looking at Exhibit

1 3. And 19.15.43 -- I'm getting there. Nine. So
2 19.15.43.9. May be easier, just page 11. Part of the
3 injection well construction requirements. So page 11
4 of Exhibit 3 at the bottom of the page, starting at
5 part G.

6 MR. EALES: And I'm familiar with this
7 section. I don't remember seeing it obligates to run
8 the casing to the bottom of the injection zone though.
9 Extend to the injection zone. One long-string casing
10 must extend to the injection zone.

11 DR. AMPOMAH: Exactly. To the
12 injection zone. And that is what I know EPA requires.
13 Now -- so are we on the same page that there has to
14 be -- that string goes through the injection zone?

15 MR. EALES: I'm not sure. I'm not sure
16 how to interpret to the injection zone. My experience
17 has been to the injection zone and then open hole from
18 there.

19 DR. AMPOMAH: Okay. Let -- let me ask
20 Dr. Schnarr on this one. Have you worked on any
21 permit where the injection zone is left open hole?

22 DR. SCHNARR: I have worked on permit
23 applications where the injection is left open hole.
24 Yes.

25 DR. AMPOMAH: And EPA accepted that?

1 DR. SCHNARR: Well, they're
2 applications. So I wouldn't want to get ahead of --
3 of saying that. For these specific instances, I'm
4 aware of. They are still in the review stage.

5 DR. AMPOMAH: So would it be the
6 position of OCD, representing the state of New Mexico,
7 to leave it open that -- I mean, injection zone can be
8 left open?

9 MR. EALES: Position of OCD would not
10 be my place to state.

11 DR. AMPOMAH: I mean, -- so the rule.

12 MR. EALES: So my -- what I would say
13 from my experience is there are some conditions in
14 which open hole is appropriate. And some conditions
15 where you need cased hole and -- and the aligner. You
16 need to have protection from the formation you're
17 injecting into. And my recommendation would be to
18 leave it open to the discretion of the permit and
19 the -- and the Commission.

20 DR. AMPOMAH: But definitely there has
21 to be some guidelines to guide the director as part of
22 the rule; right? To make those decisions. Because
23 Permian, I can see that, because you're going all the
24 way to 18,000 feet. The San Juan basin. I mean, can
25 someone help me?

1 DR. SCHNARR: I think you kind of
2 directed this to me. I would say I understand and I
3 agree that some operators have been confused on this
4 point. And there may be an opportunity for additional
5 clarity on open hole completions.

6 DR. AMPOMAH: So will OCD more or less
7 take this on and at least provide some guidelines, you
8 know, so it is much clearer?

9 MR. EALES: I think that's -- I think
10 that's a good recommendation from my view.

11 MR. WRINKLE: No, I -- I think it makes
12 perfect sense, especially with Dr. Schnarr saying that
13 there has been confusion in the past.

14 DR. AMPOMAH: And so does that mean
15 that acid gas injection well right now is on the spot
16 to become Class VI?

17 MR. WRINKLE: No, no.

18 DR. AMPOMAH: No, no.

19 MR. WRINKLE: No.

20 DR. AMPOMAH: Okay. But so in the
21 Permian, most -- some of these Class II wells -- I
22 mean, it's very deep, 18,000 feet. And if you are to
23 require chrome casing for -- from 16,000 to 20,000
24 feet, I mean, that's a -- that's a big killer.

25 MR. EALES: Yeah. And the other thing

1 to -- that -- of the guidance is a good idea. I like
2 the idea. Because what gets contemplated with any
3 operator that wants to drill a well, they want it to
4 last for a long time as well. And the Siluro-Devonian
5 is robust enough that you don't have the concerns of
6 coming in, falling in, sloughing off.

7 And so the casing doesn't have the
8 value because of that rock hardness of the Siluro-
9 Devonian, but a lot of other areas will have areas
10 where they'll slough. You'll have clays fall in, and
11 casing is definitely the way to go. So those are
12 things that could be handled in some guidance.

13 DR. AMPOMAH: Yeah. And that -- that
14 is -- and I'm -- I'm glad that is on the record. So
15 definitely OCD has to look into this, you know,
16 because I'm just thinking about how -- because if you
17 look at different Class II wells in the San Juan
18 basin, if it's saltwater disposal wells, do have
19 casing into the injection zone. In the Entrada. And
20 we're saying that, okay, for even more -- let's say
21 more -- like CO₂, we can leave it open. I mean, I'm
22 just trying to -- I feel like it's just not feasible.
23 So some guidance on that will be really helpful.

24 MR. EALES: No, appreciate the point.

25 DR. AMPOMAH: Thank you. Now, let --

1 let me ask. Still on the Class II. So -- and we will
2 go through the rules, and I do have some questions
3 there.

4 So I asked about, based on a discussion
5 that we had, does that mean that acid gas injection
6 wells are more or less at the forefront to become
7 Class VI? And Mr. Wrinkle said, "No, no, no."

8 So I want to ask, what additional
9 requirements apply when converting an older Class II
10 well to, let's say, a Class VI? And this one, anyone
11 can have -- anyone can respond to that.

12 MR. EALES: Yeah. And what I would say
13 is that an older well, most wells that I'm aware of,
14 if not all wells I'm aware of, do not meet the same
15 criteria of having to present to the Commission the
16 inject date composition. They'll -- they'll provide
17 the percentage of, in this case, H₂S or CO₂, but not
18 necessitate the evidence and the backup of that inject
19 date analysis, as well as the API or SPD standards
20 that relate to the choice in the metallurgical casing
21 choices and the cement.

22 So those have been required in the --
23 in AGI wells, but not for the entire duration of the
24 program. Early on in the program, a lot of AGI wells
25 were converted to SWDs that had no alloys. So many of

1 those won't meet that requirement from that
2 standpoint.

3 But even of -- of late, there's not
4 that backup information as to why the different alloys
5 were chosen. But it had -- there's a requirement that
6 you must choose CRA generally for the bottom 300 feet
7 of casing and tubing, and Inconel for the packer.

8 But this standard, this one here, it
9 says you not only have to provide the inject date
10 analysis, but you have to -- have to be able to prove
11 through API and ASTM standards that the material
12 choices you have will last through that completion and
13 the final injection.

14 So for an operator, it'd be very
15 difficult, if not impossible, to pull that forward.
16 And on top of that, of course, you've got the
17 monitoring well that we've talked about. Some of
18 these other requirements would be difficult, but
19 primarily you can't go back and change out components
20 in a well. It's not as easy as that.

21 DR. AMPOMAH: So then are you saying
22 based on your knowledge now, you feel like probably
23 there's not much wells that would meet the criteria?

24 MR. EALES: That's correct. I agree
25 with that.

1 DR. AMPOMAH: Okay. Do you believe
2 there are some wells that could meet that criteria?

3 MR. EALES: I'm only aware of one that
4 I actually permitted and designed that was done with
5 the intent of meeting Class VI. But I'm not aware of
6 any others. And even then, I'm not even sure if it
7 would -- this is a very strict standard.

8 DR. AMPOMAH: Okay.

9 MR. EALES: I'm not sure if it would
10 even meet that intent. So I tend to say zero from
11 anyone -- any I'm aware of.

12 DR. AMPOMAH: So the burden is going to
13 be the -- on the operator?

14 MR. EALES: The burden is on the
15 operator.

16 DR. AMPOMAH: On the operator.

17 MR. EALES: Absolutely. You would have
18 to go back and look at everything; logs, cement, you
19 know, all the records and specifications, pull forward
20 that information that likely is impossible to find
21 that, but it's -- it's possible, I guess, but
22 difficult.

23 DR. AMPOMAH: Then there was something
24 in the rule that surprises me. Even you're talking
25 about the acid gas injection wells that are very close

1 to that of Class VI. And there's been a discussion
2 about Class II wells for oil and gas production. And
3 there -- I know that you said these are just copy and
4 paste from the federal rules into the -- the current
5 rule.

6 And tomorrow, let's say -- we'll --
7 we'll go through that, because if you've done your
8 basic analysis and then you see that probably -- even
9 there's probably no well in the state, except -- that
10 could even be on the path to become Class VI.

11 MR. EALES: Yes.

12 DR. AMPOMAH: Essentially, all Class II
13 wells for production and injection into production
14 zones probably do not qualify.

15 MR. EALES: I agree with that.

16 DR. AMPOMAH: So that provision in
17 the -- in the rule, I really want us to explore that.

18 DR. SCHNARR: Do you want me to answer
19 that now or tomorrow when we go through it?

20 DR. AMPOMAH: Yeah, you can start now
21 and then we will still probably bring it up tomorrow.

22 DR. SCHNARR: I'll just try to clarify.
23 The intent of that section of the rule is to preclude
24 operators from trying to skate by as a Class II. When
25 really the intent of their project is long-term

1 storage.

2 Because the Class VI regulations are
3 more stringent, EPA envisioned, and there may be the
4 potential for, given the tax breaks, an operator
5 trying to operate really a long-term storage project
6 as a Class II. And so the intent of that section of
7 the rule is to -- to give the director criteria that
8 they should evaluate to see if that's no longer
9 workable as a Class II project.

10 DR. AMPOMAH: But even in there, so you
11 may -- there is one, and we will look at it tomorrow,
12 when you say that when the -- when the pressure is
13 building up. Or let's say when there's increasing
14 pressure. When there's increasing rate. I mean, it's
15 not quantified. So what guidance does the director
16 has to quantify those to trigger that? Something for
17 us to think about.

18 DR. SCHNARR: Yeah, I agree. In this
19 case, there is also not really very thorough EPA
20 guidance on your questions. So I -- I agree with you
21 it's something to think about to maybe be more
22 quantitative. I'm not sure if that's appropriate in
23 state guidance or -- or rule, but those criteria are
24 listed out, at least as a starting point for what
25 should be considered.

1 DR. AMPOMAH: I will say that probably
2 more in a guidance because things will evolve over
3 time. But definitely right now it's open-ended. And
4 that puts a lot of pressure on the director. You
5 know, someone coming in and say, hey -- so you know
6 what I mean.

7 DR. SCHNARR: I agree with you. Yes.

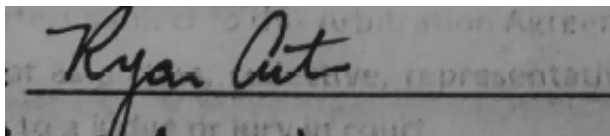
8 DR. AMPOMAH: Okay. I think I'll
9 probably want to pause here because I'm going to go
10 into the mechanical integrity and operational
11 monitoring. So I prefer to probably pick it up in the
12 morning, if you -- Ms. Chair if it's okay.

13 THE HEARING OFFICER: Yeah. Thank you.
14 Thank you, Commissioner Ampomah. Thank you, panel.
15 We'll resume at 9 a.m. and begin with any public
16 comment that there is to be given.

17 (Whereupon, at 4:53 p.m., the
18 proceeding was concluded.)
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CERTIFICATE

I, RYAN AUTEN, the officer before whom the foregoing proceedings were taken, do hereby certify that any witness(es) in the foregoing proceedings, prior to testifying, were duly sworn; that the proceedings were recorded by me and thereafter reduced to typewriting by a qualified transcriptionist; that said digital audio recording of said proceedings are a true and accurate record to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

A handwritten signature in black ink, reading "Ryan Auten", is written over a horizontal line. The background of the signature area is a light gray, textured surface.

RYAN AUTEN

Notary Public in and for the
State of New Mexico

CERTIFICATE OF TRANSCRIBER

I, LAURA ROAM, do hereby certify that this transcript was prepared from the digital audio recording of the foregoing proceeding, that said transcript is a true and accurate record of the proceedings to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

A handwritten signature in black ink, appearing to read 'LR', with a long horizontal flourish extending to the right.

LAURA ROAM

[& - 3d]

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New Mexico Rules of Civil Procedure for the
District Courts

Article 5, Rule 1-030

(e) Review by Witness; Changes; Signing.

If requested by the deponent or a party before completion of the deposition, the deponent shall have thirty (30) days after being notified by the officer that the transcript or recording is available in which to review the transcript or recording and, if there are changes in form or substance, to sign a statement reciting such changes and the reasons given by the deponent for making them. The officer shall indicate in the certificate prescribed by Subparagraph (1) of Paragraph F of this rule whether any review was requested and, if so, shall append any changes made by the deponent during the period allowed.

DISCLAIMER: THE FOREGOING CIVIL PROCEDURE RULES
ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.
THE ABOVE RULES ARE CURRENT AS OF APRIL 1,
2019. PLEASE REFER TO THE APPLICABLE STATE RULES
OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS

COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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