POLLUTION CONTROL HEARINGS BOARD
STATE OF WASHINGTON

WASHINGTON STATE DAIRY FEDERATION, the WASHINGTON FARM BUREAU, PUGET SOUNDKEEPER ALLIANCE, COMMUNITY ASSOCIATION FOR RESTORATION OF THE ENVIRONMENT (CARE), FRIENDS OF TOPPENISH CREEK, SIERRA CLUB, WATERKEEPER ALLIANCE, CENTER FOR FOOD SAFETY, and RESOURCES FOR SUSTAINABLE COMMUNITIES,	) PCHB No. 17-016(c)
Appellants,	)
vs.	)
STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY,	)
Respondent.	)

HEARING
VOLUME II
May 22, 2018
Olympia, Washington
Pages 200 through 409

Taken Before:

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BE IT REMEMBERED that on Tuesday, May 22, 2018, at 1111 Israel Road SW, Olympia, Washington, at 8:52 a.m., before ANDREA L. CLEVENGER, CCR, RPR, the following proceedings were had, to wit:

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JUDGE FRANCKS: So in the last day or this morning, I received information about the Reck deposition transcript. From the dairy federation, I have received deposition designations, and from PSA, I have received a letter with objections to those designations.

So I will deal with that, but I'm not prepared to deal with it right now, so the question for you all is: Does -- when do we expect to be asking any witness about the deposition?

MS. HOWARD: Your Honor, it's possible we will do that during Mr. Jenning's testimony this morning during cross.

JUDGE FRANCKS: Okay. So then I have to do it, which means we delay this morning. All right. Anything else that we need to talk about before we commence this morning?

MS. HOWARD: Your Honor, do you want me to respond to the filing last night?

JUDGE FRANCKS: Is that -- I thought you had another issue.

MS. HOWARD: Oh, no.

MS. NICHOLSON: Just that one.

MS. HOWARD: That was our issue.

JUDGE FRANCKS: Okay. There you go. I think I have enough information, so I -- unless you have a solution, unless you have a proposal about the designations.

MS. HOWARD: Well, so the designations, we sent those to you yesterday by email, but we have provided those all to the parties last week, so that was just an oversight on our part that we hadn't got that into your record. What you guys had was a clean copy of the transcript.

JUDGE FRANCKS: Right.

MS. HOWARD: And then yesterday we had talked about -- Ms. Barney and I talked about there's one document that she had raised an objection to during the deposition. We did speak about that during a break yesterday, and I'm going to -- let me make sure I get this correct, Ms. Barney.

So they would like to maintain their objection but didn't object to designating that portion of the transcript. So the designated transcript that you have

includes both our objection but also the section that followed, that related to a particular document that she objected to on foundation.

I'm probably giving you too much information and making it too confusing, but I just wanted to make sure that was clear, that we had conferred on that and we're in agreement that that portion of the transcript would still be designated.

JUDGE FRANCKS: Okay. So, Ms. Barney, let me just ask you: So the portion that you were concerned about is designated and you want it to remain designated.

MS. BARNEY: Yes. That's fine as it is.

JUDGE FRANCKS: Okay. That's what I needed to know.

Okay. Do we know exactly what that is? That would be helpful.

MS. HOWARD: Yeah. And I can find it for you. It was with regards to an email from Sally Fredwig (phonetic). I can just find it really quick. I think it's on Page 67. It starts on Page 65, Line 11, and goes through Page 67, Line 16. That's where we're discussing that particular email.

And Ms. Barney's objection is on top of Page 66.

JUDGE FRANCKS: Okay. All right. So Page 65, Line 11, to Page 67, Line 16?

MS. HOWARD: Correct.

JUDGE FRANCKS: All right.

MS. HOWARD: And then the only other thing I think we would maybe add is -- we did share this with Mr. Tebbutt when he raised this similar objection last week, is that -- and I think this is obvious from the transcript, so I apologize if it is -- that the attorney for NRCS was present throughout the entire deposition and was specifically ensuring that we stayed within the scope of the purpose of Mr. Reck's testimony, which was to address the NRCS Standard 313 and the basis for it.

And there were a number of -- maybe a number of times is too much, but there were a few times where she specifically would stop the deposition and ensure that we stayed within that scope.

So to the extent that there are objections being raised related to whether we stayed within the scope of the purpose of the testimony as determined by NRCS -- and you repeated that as well on your ruling -- there was -- she was there specifically, obviously for other purposes as well, to defend her client, but she very much was paying attention to that, to ensure that we stayed within

those bounds throughout the deposition.

JUDGE FRANCKS: Okay. Yes. And I've read the deposition. I just haven't -- I haven't had a chance to line up the things that you were objecting to and assess whether they fit within the scope of what I ordered.

So that's what I'm going to do. So I would say let's plan to begin at 9:30, and I will come back when I'm done. So if it takes a little longer, that's because I'm still doing it.

MS. HOWARD: Thank you, Your Honor.

JUDGE FRANCKS: And we're off the record.

(Recess from 8:58 a.m. to 9:31 a.m.)

JUDGE FRANCKS: Let's go back on the record.

So I have reviewed the Reck deposition, and I have reviewed the objections submitted by PSA, and I have looked at each and every entry that PSA objected to, and I have concluded that those all relate to the basis for Standard 313, which is what the issue is that NRCS is -- we needed their testimony about.

So I am going to leave the deposition designated the way it is, but let me just check the logistical question.

So the hyperlink that we have is to just the blank deposition -- not blank, but undesignated?

MS. HOWARD: That's correct, Your Honor.

JUDGE FRANCKS: Okay. But I can have Lynn take the designated version that I have now and fix that.

MS. HOWARD: That's right. That's why we emailed it. And we also provided you with binders, and the binders are also not designated version, so I apologize. It was a little bit of a fire drill, trying to get that all together.

JUDGE FRANCKS: Okay. What I'm going to do -- I'm not going to have her do that right now just because that would delay us more, but -- so I think, if we need to look at it before she has a chance to do that, we'll just look at the undesignated version.

But I have the designated version in front of me, so we can ascertain whether -- whatever we're talking about has been designated or not.

Okay. So --

MR. SNYDER: Your Honor, just for preservation purposes, I want to make sure that our objection to this testimony as outlined in our letter is on the record.

JUDGE FRANCKS: You filed it, so, yes, it's on the record.

MR. SNYDER: Thank you.

JUDGE FRANCKS: All right. Let's go off the record, and I will be back in one minute with the board.

(Pause in the proceedings.)

(Board members enter.)

JUDGE FRANCKS: You may sit down here.

All right. We are back on the record. And we are resuming Day 2 with Mr. Jennings on cross.

Ms. Matsumoto, you may proceed.

CROSS-EXAMINATION (Continuing)

BY MS. MATSUMOTO:

Q Thank you. Good morning. Good morning, Mr. Jennings.

A Morning.

Q I want to revisit a couple things from yesterday before moving on to the new subject areas, and just I will note for the record we also have Mr. Jennings on our witness list, so it's sort of a combined direct and cross.

Yesterday you talked about phosphorus. Ms. Barney asked you some questions. Do you remember that?

A Yes.

Q Okay. And was it your testimony yesterday that the combined permit includes limitations based on phosphorus

for land application?
A Yes, I believe it was. I'd have to look at the record to see my exact testimony.
Q Can we look at Exhibit A-6. Oh, and, again, you'll need those binders behind you, definitely the two in the middle.
JUDGE FRANCKS: Oh, Ms. Matsumoto, we need a mic for the court reporter.
MS. MATSUMOTO: Sorry about that. My apologies.
Q (By Ms. Matsumoto) Mr. Jennings, do you have A-6 in front of you?
A Yes.
Q Okay. Could you tell us what that document is called?
A This is for consolidated case 07-016C, "Appellants Puget Soundkeeper Et Al.'s First Set of Requests for Admission to Washington State Department of Ecology and Ecology's Answers Thereto."
Q Have you seen this before?
A Yes.
Q And could you turn to Page 20, please.
A Okay.
Q Could you read Request for Admission No. 47 and then the response that continues on the following page. 47, I believe, is at the bottom of Page 20.

A Okay. "Request for Admission No. 47: Admit the combined state federal CAFO NPDES general permit does not limit land application rates based on phosphorus."
Q And the answer on the following page is?
A The answer on the following page is "Response: Admit."
Q So wouldn't you agree, in written discovery, Ecology represented that the combined permit, in fact, does not limit land application based on phosphorus?
A I would disagree with that. Because the question here was land application rates, which is different than a nutrient budget. A nutrient budget is what would actually determine the total amount of phosphorus that -- excuse me -- may be land applied.

The application rate is just the rate at which manure or other materials is applied at one time.

Q But just looking at this request for admission that's right in front of you, wouldn't you agree that, in written discovery and under oath from I believe your supervisor Bill Moore, Ecology admitted that the combined permit doesn't limit land application based on phosphorus?

You read the response. It says admit; is that correct?

MS. BARNEY: Objection. Asked and answered.

MS. MATSUMOTO: I don't believe I got a clear answer, actually.

JUDGE FRANCKS: I'm going to overrule the objection. I think it was a different question.

A Okay. Can you repeat, please.

Q (By Ms. Matsumoto) I'm asking just what's in front of you in written discovery and what was produced to us throughout the course of this case, which is that RFA 47 states or asks Ecology to admit that the combined permit does not limit land application based on phosphorus, and the response is -- you just read to us -- says "Admit," does it not?

A The response in here is admit, yes.

Q You talked about tile drains yesterday, and Ms. Barney was asking you some questions about tile drains in the context of agricultural stormwater.

Do you remember that?

A Yes.

Q Okay. And you had testified that discharges from tile drains into surface waters or other ditches would not be agricultural stormwater; correct?

A I believe so, yes.

Q And the reason for that is that it bypasses the edge of field practices that you talked about yesterday?

A Correct.

Q And so in that case, the permittee, if they're discharging from tile drains, would not be in compliance with the permit because those would be unauthorized surface water discharges; isn't that right?
A If the discharge is from the activities taking place on the land, that would not be an authorized discharge.
Q And there's no surface water monitoring required at tile drains, is there?
A Well, there would be visual monitoring as part of the field edge practices that's required as part of the permit, visual inspections to make sure the practices are working, but specifically for a tile drain, no.
Q That's right. No surface water monitoring at tile drains to monitor for discharges; correct?
A To monitor what's coming out of the tile drain?
Q Yes.
A No. We don't have that monitoring.
Q And so, as you stated, there's a possibility that an unauthorized discharge could be occurring from the tile drains, and there's no monitoring required, so Ecology won't be able to know whether surface water quality standards are being impacted by those unauthorized discharges from tile drains, will they?
A So we would not actually measure what is coming out of the tile drain, no. The permit wouldn't require actual

monitoring what's coming out of the tile drain.
Q Okay. Could you turn to Exhibit A-58, please.
Oh, A-58. Sorry.
A Okay.
Q Do you recognize this document?
A I believe this is an email chain I was shown in my deposition.
Q Could you just briefly tell us what it is.
A This is an email chain, it looks like, to Melissa Gildersleeve from Ron Cummings, and this is an email chain for an email that is expressing Ron's concerns about some of the decisions that were made in the CAFO permit.
Q And who's Ron Cummings?
A Ron Cummings is another Ecology staff member in the watershed management section of the program.
Q Was he involved in drafting this permit?
A Yes. He did participate in some of the development discussions.
Q Okay. Could you please read the second paragraph for us.
A So the one that starts with NRCS Tech Note 14?
Q Yes.
A Okay. NRCS Tech Note 14 specifically states that winter, parentheses, October 1 to March 1, manure applications are not allowed if the fall soil nitrate test is greater

than 60 pounds NO3 an acre, approximately 17 parts per million.

Q That limitation isn't reflected in the permit, is it?

MS. HOWARD: Your Honor, we're going to object on this just because Tech Note 14 isn't actually before the witness, and so we're -- the witness is being asked to comment on an email in an email chain that he wasn't actually even involved in about a tech note that isn't in front of him.

So that was a really long objection. I apologize, but I think that's a foundation objection.

MS. MATSUMOTO: Mr. Jennings has already stated that the center of the email is somebody that he worked closely with in drafting the permit.

MS. BARNEY: Objection. Misstates his testimony.

JUDGE FRANCKS: I'm going to sustain that objection because I think it does misstate his testimony.

But what was the question that you asked him?

MS. MATSUMOTO: I believe I had just asked him to read the second paragraph and hadn't asked -- oh, I actually asked if that -- what was in the second paragraph was reflected in the combined permits.

JUDGE FRANCKS: I am going to sustain

the foundation objection. So let's move from there.

MS. MATSUMOTO: Just as a housekeeping matter, I would like to move for admission of Exhibit A-6.

JUDGE FRANCKS: A-6 is admitted.

(Exhibit No. A-6 admitted.)

Q (By Ms. Matsumoto) Could you tell us the date of this email, Mr. Jennings?

A Looks -- the sent date on this email is January 24th, 2017.

Q And you mentioned, when I first showed it to you earlier, that it looks like it was something that was used in your deposition?

A I believe that's where I recognize it from, yes.

Q So you've read this email before?

A Just during my deposition.

Q But the contents of it then aren't new to you, as we sit here today? It was something that was used in your deposition; is that correct?

A Yes.

Q Okay. Did you have any conversations with Mr. Cummings about his concerns expressed in this email?

A Not that I recall.

Q Did you have any conversations with anybody about Tech Note 14?

A Not that I recall either.
Q Did you have conversations with anybody about a different winter application standard similar to what Tech Note 14 requires?
A During development discussions, we did discuss winter land application, what may be appropriate controls on it, but I don't remember the specifics of those discussions.
Q So you don't remember if using a fall soil nitrate level as a standard for when to allow or to prohibit winter applications was something that Ecology ever discussed internally?
A I do not recall discussing that.
Q Okay. Could you look at Exhibit R-10.
A Okay.
Q Okay. And we looked at this yesterday; correct?
A NRCS Tech Note 23, correct.
Q Yes. One moment here. We're pulling it up on the screen. Could you turn to Page 3, please.
And just could you remind us, Tech Note 23 is referenced in the permit as part of the lagoon assessment; correct?
A For existing lagoons, yes. Correct.
Q Okay. And Tech Note 23 isn't meant to provide a quantitative analysis; is that correct?
A I believe it is mostly a qualitative assessment.

Q And isn't this designed to be used by trained personnel? It's directed at NRCS personnel, is it not?
A Yes. It's directed at -- as NRCS guidance.
Q And yet this is something you expect farmers to be able to complete on their own?
A My expectation is that the permittee has the assessment completed if -- I believe that, if the permittee has the expertise, they could complete it themselves, but if they don't, they would be required to obtain the services to help them complete it.
Q Could you read the bottom paragraph for us, starting under the bolded word "Procedure."
A "Procedure. Through this procedure, NRCS personnel will establish an overall assessment category of a WSP, waste storage pond, according to observed factors that may contribute to the risk of water resource degradation. NRCS personnel will assign one of four rating categories and corresponding subcategory."
Q So, again, Tech Note 23 contemplates that trained NRCS personnel are completing the assessment and assigning risk levels; correct?
A This statement here is that NRCS personnel will do the work.
Q When you were developing the permit, did you evaluate records either from WSDA or Ecology to determine how

likely it would be for a farmer to complete this assessment on their own?

A No. I don't believe we discussed that.

Q Do you know if farmers have requisite records for lagoons that in some cases may be decades old?

A I do not know if farmers will have all of the records.

Q Where in Tech Note 23 does it require a permittee to measure depth to the seasonal high water table?

A I would have to look.

Q I believe Page 15 there should be a form or what looks like a chart that says "Site Soils Report"?

A Okay.

Q Do you see that?

A Yes. I see the site soils report.

Q Okay. And then could you tell us in the bottom of that bolded square -- it's kind of in small font -- what it says?

A Oh, so the very --

Q The very last --

A -- bottom right-hand corner?

Q Yes.

A "Depth of the water table."

Q Right. And so this is all part of an assessment requirement in the permit that is asking farmers to look for the two feet vertical separation from the bottom of

the lagoon to the water table; is that right?
A So the permit does require the assessment, and part of the assessment is determining if there's two feet from the bottom of the outside of the lagoon liner to the water table.
Q Okay. So how will a farmer measure that?
A I couldn't answer that. That's not really something that I know. That may be a question better posed to Melanie.
Q Do you think a farmer will have the capability to do that?
A Well, the permit requires the completion of the assessment, and if they need technical assistance, it's expected that the permittee would obtain the assistance necessary to complete the assessment.
Q Is it a requirement that they have trained personnel complete the assessment? It's just an option, isn't it?
A Well, it's required that the assessment is completed. How -- we didn't specify in the permit who specifically has to complete the assessment --
Q That's right.
A -- other than the permittee needs to have the assessment completed.
Q Could you look at Page 28. And this is showing some different risk categories; is that correct?
A Correct.

Q And are these the same risk categories that the permit refers to?
A These are two of the risk categories that are referred to.
Q Okay. Could you tell us what -- well, looking at Categories 2B and 2C, you agree that the recommendation for those two risk categories involves discontinued use of the waste storage pond, does it not?
A Category 2B and 2C do state here, in part, that NRCS recommends discontinued use until minor repairs or improvements have been completed.
Q The permit doesn't require that lagoons in those categories be dis- -- the use of those lagoons be discontinued, though, does it?
A No, it does not.
Q And you consider that to be AKART?
A If the lagoon is in one of those categories after assessment as part of the permit, then the existing lagoon would be AKART for that facility.
Q Even though the permit doesn't actually require discontinued use, where here in Tech Note 23 the recommended protocol for the assessment recommends discontinuing the use?
A Yes. Ecology made a different decision in the permit than is provided in a guidance document.

Q Okay. Staying on the subject of lagoons, yesterday I believe, when you were kind of describing the lagoon assessment generally, you used the phrase that lagoons seemed to be in good shape.

Do you remember that?

A I don't remember my exact statement, but I believe my statement was to the effect of -- that we had heard during discussions that -- and those were discussions with industry -- that lagoons were in good shape.

Q So industry represented to you that lagoons were in good shape, but Ecology didn't independently verify that?

A We did discuss lagoons with Washington State Department of Agricultural, and that led us to -- well, that led -- that helped us make our decision.

Q So you accepted the industry's characterization of their -- the quality of their own waste storage lagoons without undertaking any independent assessment on your own; right?

MS. NICHOLSON: Objection. Misstates testimony.

JUDGE FRANCKS: I'm not sure that it misstated his -- I'm not sure it said anything about his testimony. I think it's just a new question. So I'm going to overrule that objection.

A So Ecology did not go out and assess all the lagoons

itself, no.

Q (By Ms. Matsumoto) So your statement that the lagoons were in good shape is purely based on the conversations you had with industry?

A I believe so, yes.

Q Okay. Could you open Exhibit A-69, please.

A Okay.

Q Okay. And we looked at this a bit yesterday, but just as a refresher again, this is one of the comment letters, and you said that you had read this comment letter in the process of developing the permit; correct?

A Yes, I believe so.

Q Okay. Could you turn to Page 11, please. And, Mr. Jennings, we touched briefly on the Cow Palace case yesterday, and you're familiar with that litigation; correct?

A A bit, yes.

Q Okay. Looking about halfway down the page, there is a sentence and then a quote that starts with, "According to U.S. District Court Judge Rice."

Could you just read that aloud, that section for us?

A Okay. So, "According to U.S. District Court Judge Rice, the fact that lagoons leak is genuinely not in dispute. Even assuming the lagoons were constructed pursuant to NRCS standards, these standards specifically allow for

permeability and thus the lagoons are designed to leak.

"There can be no dispute that the lagoons are leaking unless allowing nitrate to accumulate into the soil and at rates possibly higher than 3 million gallons per year."

Q And the quote ends with Footnote 44, where you see it's referencing the order on summary judgment from the Cow Palace litigation.

Do you see that at the bottom?

A Yes.

Q Okay. Do you agree that that description sounds like lagoons are in good shape?

A I think that lagoons could be in good shape, but the -- what's stated here is that the NRCS design standards essentially have a permeability and that permeability allows seepage.

So a lagoon could be in good shape and performing as intended, even though there is a seepage there.

Q Even 3 million gallons? Doesn't that sound like the lagoon is not in good shape and not protective of groundwater quality?

A Well, the statement here at least -- so it's not clear to me from this statement here if it's meaning lagoons across the state or a specific lagoon, but for me, with the permit conditions being what they are and -- I

believe those conditions to be protective, even though a discharge is being allowed from lagoons.

Q A discharge of that magnitude? You would still find that to be protective?

A Well, this, I don't believe, would be a discharge from a single lagoon. If it was -- so across the state, I believe it would be protective.

Q If it were from a single lagoon or a single facility, wouldn't you agree that that would not be protective of groundwater quality?

A I don't have enough information here to say if, for a particular lagoon, this would be -- this discharge would be protective or not.

Q All right. I would like to talk about the Manure Pollution Prevention Plan.

You testified yesterday that several dairies have already applied for permanent coverage; correct?

A Yes. That is correct.

Q Okay. Have you received any Manure Pollution Prevention Plans to -- as of today, sitting here?

A Yes. I believe we have received some. I don't know off the top of my head which facilities those would be from, no.

Q Do you know how many you've received?

A Not off the top of my head.

Q Have you reviewed them?
A I briefly looked at them, but I did not review them in any detail.
Q I have -- so yesterday you went through that comparison chart and some of the requirements of the CAFO rule, the regulations compared to what the permit requires. And I have an additional section of the CFR that I'd like to direct you to, and I have hard copies as well.

All right. Mr. Jennings, could you -- I've highlighted a section in front of you. We're looking at 40 CFR, Section 122.23(h)(1).

A Okay.
Q Could you read the highlighted portion out loud for us.
A So let's see. "Procedures for CAFO seeking coverage under a general permit. CAFO owners or operators must submit a notice of intent when seeking authorization to discharge under a general permit in accordance with Section 122.2AB.

"The director must review notices of intent submitted by CAFO owners or operators to ensure that the notice of intent includes the information required by Section 122.21(i)(1) including the nutrient management plan that meets the requirements of 122.42(e) and applicable effluent limitations and standards including those specified in 40 CFR -- 40 CFR Part 412."

Q And so this requires the nutrient management plan to be submitted at the time of application for coverage; correct?
A That's what this states, yes.
Q Okay. And the -- it also includes the provision providing for the opportunity for public comment; correct?
A Later on in this section, yes, it does.
Q And so under 40 CFR 122.23(h)(1), an application for permit coverage is supposed to include the nutrient management plan, which is all provided for public review and comment before coverage is issued; correct?
A Yes. That's what it states here.
Q Could you get Exhibit -- I believe R-1 is the combined permit. We'll just be referencing that a bit. I'd like you to have it handy. And Section -- I think it's 7A.
A Page 35?
Q Yes. That's correct.
And could you, under S7.A, just take a look at that and the time for submission of the MPPP is within six months of coverage; is that correct?
A Yes. That is correct. The permit requirement.
Q And so Ecology will issue permit coverage to an applying facility without actually receiving and reviewing the Manure Pollution Prevention Plan; right?

A The Manure Pollution Prevention Plan is a requirement of the permit, so we receive it after permit coverage.
Q But at the time that permit coverage is issued, Ecology has not received or reviewed the MPPP; correct?
A That is correct.
Q Okay. And, similarly, the MPPP is then not available for public comment prior to issuing permit coverage; right?
A That is correct.
Q Under the combined permit, the public doesn't ever actually have the opportunity to comment on the MPPP; right?
A Because the plan is just discussing how the -- how the permittee is meeting permit requirements, no, there is no -- not public comment on it.
Q And what about for updates to the manure prevention -- pollution prevention plan? In the handout that Ms. Barney gave yesterday, 40 CFR 122.42(e)(6), do you still have that from yesterday?
A I would need a copy.
Q Okay. Could you read 122.42(e)(6) for us, please, starting with "Changes to a nutrient management plan."
A So, "Changes to a nutrient management plan. Any permit issued to a CAFO must require the following procedures to apply when a CAFO owner or operator makes changes to the CAFO's nutrient management plan previously submitted by

the director."

Q And then looking down at Section 62, there are two subsections there, A and B?

A Correct.

Q Do you see those? Okay. And in Subsection A, could you just go ahead and read that for us, please.

JUDGE FRANCKS: Ms. Matsumoto, where are you? I'm sorry.

MS. MATSUMOTO: 40 CFR 122.42(e)(6).

JUDGE FRANCKS: Okay.

MS. MATSUMOTO: Roman II, A and B.

JUDGE FRANCKS: So Page 266.

MS. MATSUMOTO: I've given my copy to the witness.

THE WITNESS: Yes. That's -- I'm looking at Page 266.

Q (By Ms. Matsumoto) So looking at II, A, Mr. Jennings, could you read that for us.

A So, "A, if the director determines that the changes to the terms of the nutrient management plan are not substantial, the director must make the revised nutrient management plan publicly available and include it in the permit record, revise the terms of the nutrient management plan incorporated into the permit, and notify the owner or operator and inform the public of any

changes to the terms of the nutrient management plan that are incorporated into the permit."

Q And then looking at Subsection B, I won't ask you to read the whole thing because it's quite lengthy, but if you could please read just the first sentence for us.

A "If the director determines that the changes to the terms of the nutrient management plan are substantial, the director must notify the public and make the proposed changes and the information submitted by the CAFO owner or operator available for public review and comment."

Q And so in either case, when changes are made, there's an opportunity for the MPPP update to be made public, and in one case the public actually has the opportunity to comment; isn't that right?

A Well, the MPP is not the same type of document that is referenced here. It's -- because it doesn't contain the effluent limitations that are being referred to as part of the nutrient management plan.

The CAFO permits -- the effluent limitation and the nutrient management plan are the permit itself. They aren't -- so we went through that public review process as part of developing the permit.

The Manure Pollution Prevention Plan just describes how the permittee on each site is meeting the performance standards in effluent limitations in a permit, which is,

as I said, the nutrient management plan.
Q But doesn't the MPPP contain the site-specific and field-specific information for how compliance is achieved?
A It describes how -- yes, how the facility is meeting permit requirements on-site, but other documents describe things like the field-specific nutrient budgets, and so those are submitted to Ecology.
Q The nutrient budgets aren't made available for public review and comment, though, are they?
A So the nutrient budgets were -- how the nutrient budgets are developed is laid out as a permit requirement. So how those budgets are developed each year was available for review and comment prior to issuing the general permit.
Q But each facility's site-specific and field-specific process for how they will comply with the terms is not something that's made available for public review and comment, correct, because that's part of the MPPP?
A So, yes, the -- the description of how the facility is meeting permit requirements is not available for public comment.
Q The site-specific and field-specific requirements; right?
A Correct.
Q But then doesn't that mean the permit isn't complying

with the rules because didn't we just look at a rule that requires the field-specific and site-specific information to be submitted at the time of application?

A So as I stated previously, we did that process as part of developing the actual general permit. The actual general permit, since it contains the effluent limitations that all facilities have to comply with versus the model in the federal rules where those effluent limitations are contained in each site-specific nutrient management plan, we've gone through the process of developing the permit as the nutrient management plan and as -- and the effluent limitations as they're required to be.

Q But a general permit cannot contain the field-specific and site-specific application rates; right? Isn't that something that has to be done on an individual basis?

A So the federal rule has two different options for those particular practices: the linear approach and a narrative approach.

Ecology, in developing the permit, chose to include the narrative approach for those field-specific budgets, for example, where the narrative approach is a description of how budgets will be calculated each year.

Q Could you look at 40 CFR 122.42(e)(5), please. And in bold, it should say, "Terms of the Nutrient Management Plan."

Do you see that?
A On Page 264?
Q Again, you have my copy.
A Yes.
Q Okay. About halfway through the paragraph, there is a sentence that says -- starts with the terms of the nutrient management plan. Could you read that for us.
A So No. 5, the heading is "Terms of the Nutrient Management Plan." Are you referring to a different section?
Q That section, but just halfway through the paragraph, there's a sentence starting with, "The terms of the nutrient management plan." I just want to get into specifically what they are.
A "The terms of the nutrient management plan with respect to protocols for land application of manure, litter, or processed wastewater required by Paragraph E1 Roman numeral VIII of this section and, as applicable, 40 CFR Section 412.4C must include the fields available for land application, field specific rates of application, properly developed as specified in Paragraphs E5I through -- or Roman numeral I through Roman numeral II of this section to ensure the appropriate agricultural utilization of the nutrients in the manure, litter, or processed wastewater, and any timing limitations

identified in the nutrient management plan concerning land application on fields available for land application."

Q Okay. So you would agree just, in looking at this section, field-specific information is required such as this, field-specific rates of application, fields available for land application? That's what you just read to us; correct?

A Yes. Field-specific information is required as part of a nutrient management plan.

Q Okay. And this is 122.42(e)(5). Could you look back at 40 CFR 122.23(h)(1). It's from the handout that I just gave you today.

And, again, I know you've already read this to us, so as we've already discussed, 40 CFR 122.23(h)(1) requires that, at the time of application, a nutrient management plan meeting the requirements of that section you just read to us in 122.42(e)(5) be submitted prior to permit coverage; isn't that right?

A That's what it states here.

Q Okay. And the MPPP, which is the field -- has the field-specific and site-specific application information, the same contents of 122.42(e)(5), is not submitted at the time of application; right?

A So the permit which contains that --

Q It's just --
A -- specific information --
Q -- a yes-or-no question.
A So yes. The manure prevention pollution plan is not submitted until after coverage.
Q And so, again, doesn't this mean that the combined permit in allowing for the field-specific and site-specific application information to not be submitted at the time of application for coverage, doesn't that mean the permit doesn't comply with the rules?
A No. Because we developed the permit to include the requirements in the federal regulations as the nutrient management plan before we issue the permit, the general permit.

Therefore, we've already included the nutrient management plan requirements as part of the permit conditions. So they are -- they have been submitted and basically reviewed through the public process prior to Ecology issuing coverage.
Q But, again, those are just general terms; right? That's not each facility's site-specific information concerning things like rates of application and fields available for manure management?
A So it is --
Q It's just a yes-or-no question.

A So the description of how --
Q It's just -- Mr. Jennings, it's a yes-or-no question.
A So yes. The information comes in after we issue permit coverage for a facility.
Q Could you turn to Exhibit A-68, please.
Okay. Do you have it up in front of you?
A Yes.
Q Okay. Do you recognize this document?
A No, I don't.
Q Okay. At the top it looks like an email chain; correct?
A Yes.
Q Okay. And are you a recipient of this email?
A It looks like I was on the last email chain, yes.
Q Okay. And could you just tell us, for the record, the date that it was forwarded to you?
A Looks like the date is April 28th, 2009.
Q Okay. And it's, as you've said, a forward; right?
A Yes. That's what it appears to be.
Q Okay. So the second from the top email appears to be something from Thomas Tebb. Do you see that part of the way down the page?
A So an email sent April 24th, 2009? Is that the one you're referring to here?
Q Yes.
MS. BARNEY: I'm going to object on

relevance.

MS. MATSUMOTO: I'm just establishing foundation. It's -- has internal Ecology communications.

MS. BARNEY: But the relevance to the issues in this case from 2009 email.

MS. MATSUMOTO: It has to go to the ability of Ecology to protect groundwater and the -- you can see from some of the contents of the email, which hasn't been discussed yet, it's relevant to the issues of the permit.

MS. BARNEY: But I don't believe it's relevant to the issues before the board, which is the constitution of the permit conditions here.

MS. MATSUMOTO: This is an email that was sent after the appeals of the last permit cycle. And so, again, it goes to Ecology's decision-making policy processes involved for the permit and the ability of the permit to protect groundwater.

JUDGE FRANCKS: I think it has tangential relevance. I'm going to let you pursue this, but I think we're very close to outside the scope.

Q (By Ms. Matsumoto) All right. Mr. Jennings, do you remember yesterday discussing the 2006 permit?

A Generally, yes.

Q Okay. And you weren't involved in the drafting of that

permit, I believe that's what you said, but it was something that you had reviewed and referenced as you worked on the drafting of the current iterations of the permit?

A I was not involved in developing the 2006 permit. I did look at it as part of my job.

Q Okay. So, again, the email from Thomas Tebb, you see where that is about a third of the way down the page?

A Yes.

Q Do you know Tom Tebb?

A Not personally. I met him and had a working relationship with him briefly.

Q And who is he?

A At the time he was the director of Ecology central regional office.

Q And just looking at some of the other recipients on the email, do you see Kelly Susewind's name?

A Yes.

Q Okay. You know Kelly Susewind?

A Yes.

Q Okay. And Mr. Susewind was going to appear as a witness in this case; isn't that correct?

A Yes, he was.

Q Okay. And Jay Manning, do you know who Jay Manning is?

A I know who he is, yes.

Q Who is Jay Manning?
A At the time he was one of Ecology's directors.
Q Okay. And so you haven't seen this correspondence before today; is that correct?
A I don't recall seeing it before today.
Q Okay. But you're familiar with some of the Ecology staff members listed there?
A Yes. I know their names.
Q Okay. This email was forwarded to you.
Do you know why you didn't read it?
MS. BARNEY: Objection. Misstates testimony.
JUDGE FRANCKS: I'm going to sustain that objection.
Q (By Ms. Matsumoto) You said you don't remember seeing this document before; correct?
A No, I don't.
Q Okay. It was forwarded to you, as you can see from the top of the email; right?
A Yes. I am on the forward.
Q Okay. And you said Jay Manning was the director of Ecology at the time; is that right?
A At the time of this email, I believe so, yes.
Q Okay. Isn't this an email that, when it was forwarded to you, seems like something you may have read as someone

who works on permits and is discussing a prior iteration of the permit that you're working on?

A I do not remember if I did or not.

MS. MATSUMOTO: Okay. I'd like to move to admit A-68.

MS. BARNEY: Objection based on relevance and lack of foundation.

MS. NICHOLSON: Join.

MS. MATSUMOTO: Again, Mr. Jennings has discussed having referenced the 2006 permit. The contents of the email goes to subsequent events following the appeals of the 2006 permit, and it's important for the record.

JUDGE FRANCKS: I'm going to exclude it. I don't think it's relevant to the issues that are before the board today.

MS. MATSUMOTO: I just would like to make an offer of proof for the record that, if we were allowed to introduce this and further discuss it including with additional witnesses, one of whom on the email chain unfortunately is not able to appear, that the relevance would become apparent.

Q (By Ms. Matsumoto) Mr. Jennings, you were present here yesterday for the opening statements; correct?

A Yes, I was.

Q And you heard Mr. Tebbutt's opening statement?
A Yes.
Q And do you remember him describing a meeting with Director Bellon that took place in July of 2013?
A Yes. I believe that was part of the opening.
Q And you were present at that meeting as well, were you not?
A I believe I was.
Q So you remember being there in July of 2013 when Director Bellon said that if citizen groups wanted her to take on the industry, that they would have to give her a big fucking stick?

MS. BARNEY: Objection. Relevance.

MS. MATSUMOTO: Mr. Jennings was present at a meeting with the director of Ecology. It was in the context of the Cow Palace litigation. Some of our clients were also present, and our clients were urging Ecology to take protective action to protect the citizens of Washington State.

MS. BARNEY: If the content was the Cow Palace litigation, that's not what's before the board.

JUDGE FRANCKS: I don't see how this is relevant. We've heard it once, and it's not relevant to the issues that are before the board today.

Q (By Ms. Matsumoto) Mr. Jennings, you mentioned multiple times yesterday that Ecology, in making decisions about what to include or exclude as permit terms and conditions, considered cost to the industry.

Did you document those costs somewhere?

A I believe I stated that those were -- a lot of our discussions were qualitative in nature about the reasonability in terms of, is it reasonable. So we didn't have documentation of those discussions.

Q So you don't have any type of actual quantitative analysis of what the costs were that you referenced yesterday?

A So for some costs we looked at, we're required to, as part of developing a permit, have a small business economic impact statement, but for -- beyond that, most of our discussions were qualitative in nature. I don't have documentation of that.

Q So you don't have any documents that actually would tell us the cost to implement certain permit terms and conditions then; is that correct?

A I believe the small business economic impact statement has some discussion of the costs of implementing some conditions, but I don't have the details off the top of my head.

Q What about consideration of other costs, like external

cost to the public? Was that something that you considered when drafting the permit?

A So could you tell me what you -- what kind of costs you're referring to? Like --

Q Yes. You testified yesterday that you were aware of a berm failure; isn't that correct?

A Yes.

Q Okay. And could you remind us where that occurred?

A I believe that was in Outlook, Washington.

Q Okay. Could you turn to Exhibit A-55, please.

Do you recognize this document?

A I -- I don't really recognize this, no.

Q It appears to be a form. Could you tell us what it says at the top of the page.

A So this is Department of Ecology Environmental Report Tracking System form.

Q And did you reference ERTS, or the Ecology report tracking system, forms yesterday? I believe I was asking you questions about how Ecology would be informed of some problem that was perhaps occurring at a facility, and you said this was one way that you could learn of problems or discharges.

Do you remember that?

A Yes. The ERTS system is a way that complaints can be submitted to Ecology.

Q So have you seen other ERTS forms reporting incidents in the context of your work with Ecology?
A I have seen other ERTS reports, yes.
Q Okay. Could you look at the bottom portion of the page? The font that's all in caps and boxed in, could you read that for us?
A So the text in the "more information"?
Q Yes. That's correct.

MS. HOWARD: Your Honor, we're just going to object on grounds of relevancy. It's not very clear how this specific enforcement or complaint-related issue relates to the CAFO permit that's before the board at this time.

MS. MATSUMOTO: I'm asking about costs, including cost to the public. Those costs could involve cleanup costs or evacuation costs or cost to health exposure.

And that's something that's reported potentially by an incident report when a berm breaks as we're about to see.

JUDGE FRANCKS: I'm going to allow it, but, again, I think we're on the edge of relevance.

MS. MATSUMOTO: Understood.

JUDGE FRANCKS: So keep it short.

Q (By Ms. Matsumoto) Go ahead.

A Caller states that last night flooding occurred when dairy berm broke, slash, failed and flooded approximately 12 homes in Outlook.

Caller states that residents were evacuated from homes. Basements flooded but unsure if main floor of residences were impacted.

Caller states concern that floodwaters had the smell of cow urine. Caller states berm has been repaired and also states that flooding spread to approximately 3,250 feet from berm. Approximately 90 acres of fields also impact.

Q So when you asked for an example of the specific types of cost to the public that I'm asking whether you considered, it would be, for example, costs involved in responding to a berm failure?

MS. BARNEY: Objection. There's no indication here that this is related to the permit.

MS. MATSUMOTO: A berm is specifically incorporated as an option for addressing risks to surface water runoff and discharges.

Mr. Jennings testified yesterday that he was aware that berms can fail. And, again, I'm inquiring about cost to the public, and this is a specific example.

MS. BARNEY: But there's no indication on this form that this is related to a berm that -- at a

facility that was under the permit or that was in any way regulated by the permit conditions.

JUDGE FRANCKS: I'm going to sustain that objection. I think you can ask him general questions, but not related to this particular flood.

Q (By Ms. Matsumoto) In general, did you consider the cost to the public that might be involved in a situation such as this where some permit term or condition may fail and the public could potentially be exposed to water that is laden with urine or manure?

A In terms of assessing dollar amounts associated with discharges, no, we did not do that.

Q And what about remediation costs? Did you consider the cost to remediate contaminated aquifers like the Lower Yakima Valley Aquifer, the Sumas Aquifer?

MS. HOWARD: Your Honor, again, objection. The question makes statements about facts that are not actually being introduced in as testimony in this case.

JUDGE FRANCKS: I'm going to sustain that objection. I think you can ask in general, but once you get into specifics that aren't part of this case --

Q (By Ms. Matsumoto) Did you consider remediation costs generally in the event that an aquifer ends up being contaminated with groundwater discharges including

conditionally authorized discharges that are specifically mentioned in the permit? Did you consider those costs to remediate aquifers?

A No. Remediation costs were not part of our consideration.

Q Yesterday you mentioned that you were aware that shellfish beds have been closed due to high fecal coliform levels and that fecal coliform is something that's present in animal waste.

Do you remember that?

A Generally, yes.

Q So did you consider something like the lost value of not being able to harvest from those shellfish beds in the event that they are closed and contaminated due to high levels of fecal coliform?

A That was beyond the scope of what we assessed for the permit.

Q So no, you didn't consider that as a potential cost to the public?

A No. That was -- that was beyond the scope of the permit development.

Q Mr. Jennings, even if the financial investment in some pollution prevention -- and, again, sounds like you do not have a quantitative documentation of what that financial investment is, but even if there's some

financial investment required from industry, should Ecology just allow pollution to continue because there's financial costs involved to the permitted entities?

MS. BARNEY: Objection. Assumes facts not in evidence.

MS. MATSUMOTO: We've been discussing cost. Mr. Jennings referenced cost yesterday and has actually stated there's no quantitative documentation of those costs.

MS. BARNEY: But allow pollution to continue?

MS. MATSUMOTO: We've described many examples of areas that are not only sources of pollution from CAFO but potential high risk areas, and the permit explicitly includes the conditionally authorized discharges.

MS. BARNEY: Which is not pollution.

JUDGE FRANCKS: I'm going to sustain the objection. I think that we're focused on the permit, and we're focused on the issues before the board here.

And I think some of your questions are more like a closing argument and less like a question of the permit writer.

So I think you can ask these questions without making assumptions about what the discharge is.

MS. MATSUMOTO: Well, that's fair, Your Honor. Although Mr. Jennings yesterday did go into some detail about areas that not only are potential for discharges but would have conditionally authored discharges under the permit.

Q (By Ms. Matsumoto) You're aware, Mr. Jennings, of groundwater contamination in the Lower Yakima Valley and the Sumas-Blaine Aquifer; correct?

A I am aware that there are nitrate impacts in those areas generally.

Q Okay. And so you didn't develop -- as part of developing the permit, you didn't consider the costs to the public involved with having nitrate contamination problems in the groundwater in those areas?

A So the permit is intended to protect water quality equally across the state, but addressing impacts in a specific area is beyond the scope of what a general permit does.

Q So those costs weren't considered then; correct? Is that what you're saying?

A That is correct.

Q Okay. And, Mr. Jennings, Ecology recognizes that dairies are the largest source of contamination of those two aquifers; isn't that correct?

A I think Ecology recognizes that they are a source. I

don't recall that we've ever said they are the largest source.

MS. MATSUMOTO: Okay. I'm reserving time for responses to board questions. That's all I have.

JUDGE FRANCKS: Okay. Let's take a ten-minute break and then we'll resume. So back at 10:55.

(Pause in the proceedings.)

JUDGE FRANCKS: Okay. Have a seat. Okay. Ms. Howard.

MS. HOWARD: Yes, thank you, Your Honor.

CROSS-EXAMINATION

BY MS. HOWARD:

Q Good morning, Mr. Jennings. I'm Elizabeth Howard here on behalf of the Washington State Dairy Federation and Washington Farm Bureau, and I just have a few questions for you about your testimony from yesterday and today.

So let's start first by looking at the permit. Let's look at R-1, which is the combined permit, and if you could turn to Page -- let me try to find the page for you to make this easier -- Page 21.

And you can see under Item 3(d)(vi), it references T-sum 200.

Do you see that there?
A Yes.
Q And you testified about T-sum 200 in your testimony yesterday, didn't you?
A Yes, I believe so.
Q When -- when Ecology considered using T-sum 200, did you consider the application of T-sum 200 on both the west and the east side of the state?
A Yes. I believe we discussed including it on both -- for use on both -- excuse me -- both the east and west side of the state.
Q So it was a methodology you intended to be applied on both sides of the state; is that correct?
A Correct.
Q Did you do an evaluation about whether it would appropriately be applied on both sides of the state? Do you recall doing that?
A I do not recall a specific evaluation.
Q Okay. Really quickly, let me back up. Is this T-sum 200 also the methodology that was referred to in the state-only permit?
A Yes. I believe that condition should be just the same.
Q And for the same purposes in the state-only permit?
A Yes. As the start date for land application and spring.
Q Great. Thanks for clarifying that.

Was this the only method that Ecology considered when evaluating when land applications should occur in the spring?

A Initially, under the draft permits, Ecology did try and use descriptive language for when to start land application, but the comments Ecology received on the draft led us to looking for a tool to use in place of that descriptive language to be more clear, and the comments indicated that T-sum 200 was -- seemed to be the preferred method of determining a start date.

Q And I think you had said yesterday that your understanding was that it was generally accepted by folks.

Who were you referring to when you made that statement?

A So generally accepted by industry, so the folks that would be permittees under the permit.

Q If there were another method that were more protective than T-sum 200, would that be a method that Ecology would have considered for purposes of determining when land applications should occur?

MS. MATSUMOTO: Objection. Vague.

MS. HOWARD: That was pretty specific actually.

JUDGE FRANCKS: I'm going to overrule

that. I think that was specific.

A I think, if there were other methods that were available that Ecology felt we could use, I think we have looked at them.

Q (By Ms. Howard) Okay. Thank you. All right. Let's move on to -- again, I'm going to try to give you a page number. We're looking still in R-1 in the combined CAFO permit, Page 18. And I'm going to be specifically referring you to the fall soil sampling paragraphs, which are the bottom of Page 18.

This fall soil sampling provision, is that the same in both this state and the combined CAFO permits?

A I believe it is, yes.

Q Okay. Do you want to take a look at the state one just to confirm that?

A Yes. Which exhibit? R-2?

Q Yes. I apologize. R-2. See if you can find it faster than me. Let's see. How about Page 18 of the state-only permit at the top there.

A So, yes, it looks -- they are the same condition.

Q Okay. Thank you. So specifically I'd like to talk about the October 1st date in this provision, and that's in the second paragraph back on R-1 on the bottom of Page 18.

And I think yesterday you testified that the purpose for that date was to having these fall soil samples taken

prior to heavy rain. Is that a fair restatement of your testimony yesterday?

A So I believe that, yes, I discussed October 1st as a date we chose to be before generally before heavy rains.

Q That's perfect. And the fall soil sample, again, one of the things that Ecology is looking for in that soil sample is that it is taken prior to the heavy rains; is that correct?

A Yes.

Q Do you recall any data or literature that you relied on to determine that October 1st would be the date that would get you to that place where you would be taking the fall soil sample prior to heavy rains?

A So that was -- that information came from Melanie Redding as part of discussions around -- I believe related to the manure groundwater literature review.

Q Okay. And I'm not asking you to actually look at the literature review, but just off the top of your head, if you will, do you recall whether the October 1st date is actually referenced specifically in the literature review?

A I don't know specifically.

Q Okay. I'm just going to ask you to look at another exhibit, and it's actually Ecology's Exhibit R-12.

Does this document in front of you look familiar to

you?
A Yes.
Q And can you just state for the record what it is.
A This is a post harvest soil nitrate testing for manured cropping systems west of the Cascades, an Oregon State University extension service publication.
Q Did Ecology rely on this document in developing the permit?
A I believe it was one of the documents that I reviewed as well as -- so, yes, I believe it's one of the documents we used.

MS. HOWARD: We'd like to move for admission of R-12.

JUDGE FRANCKS: R-12 is admitted.

(Exhibit No. R-12 admitted.)

Q (By Ms. Howard) Can I have you move to Page 15. Just before we talk about -- did I just say Page 15? I meant Page 5. You probably couldn't find a Page 15. Page 5.

Before we do that, is your understanding that this particular document was developed by -- is an Oregon State University publication?
A Yes. That's the -- states that it's an Oregon State University publication.
Q And that this specific document is looking at the Pacific Northwest and conditions in the Pacific Northwest in

drawing its conclusions. Is that a fair statement about this particular document?

A That's my understanding.

Q Okay. And then on Page 5, just the -- just trying to think of the best way to explain this. Actually, maybe I can point up here.

You see where it starts "Table 1," the paragraph that says "Table 1"?

A Okay.

Q Do you mind just reading that paragraph.

A So in the black box heading of the table?

Q No. The paragraph that starts by reading Table 1.

A Oh, left-hand column?

Q Perfect. Yes.

A Table 1 shows the average calendar date when cumulative rainfall after September 1 reaches five inches at a variety of locations.

For most locations, sampling prior to October 15 is acceptable in an average year. In high rainfall areas, parentheses, coastal areas in the cascade foothills, close, plan to sample earlier.

A late October sampling date is usually acceptable in lower rainfall areas of Southern Oregon, the Puget Sound islands, Olympic Peninsula, or Vancouver Island.

Q So, again, would you agree that this particular document

doesn't seem to be referencing October 1st as a date related to heavy rainfall when -- excuse me -- that wasn't a good question -- a date when heavy rainfall would begin to occur?

A So this -- that paragraph does not reference October 1st.

Q Fair enough. What date does it reference?

A So it would reference September 1st, October 15th, or, depending on location, it could be -- could be earlier or could be later.

Q And the middle paragraph there does say for most locations sampling prior to October 15th is acceptable in an average year. Would you agree that's what the document says?

A Yes. That's what the document says.

Q Thank you. Can we turn back to R-1 and this same language that we were just referring to for fall soil samples.

The way that the permit reads right now, if you're not able to take fall soil samples by October 1st, are you kicked into Paragraphs 3 and 4 for purposes of the soil samples you're required to take?

A Yes. That is correct.

Q And Paragraphs 3 and 4 require deeper soil samples; is that correct?

A Correct.

Q So if your -- prior to October 1st or by October 1st, your soil sample depth would be one foot?
A For heavy areas with greater than 25 inches of precipitation, yes, the soil sampling depth would be one foot.
Q Where does it say that in Paragraph 2 -- or excuse me -- in Subsection 2?
A So the fall soil sampling section here references Paragraphs 3 and 4, which define the depths at which soil samples must be taken in the fall, depending on the area of the state that the operation is located in.

And then Sections 3 and 4, Section 3 is the depth of soil samples in areas with 25 inches or less annual precipitation, generally Eastern Washington.

Section 4 is the depth of samples in areas with more than 25 inches of annual precipitation, generally Western Washington.

And so for the heavy rainfall areas, as I was -- as were mentioned, in Western Washington, the fall soil samples have to be taken at the zero to 12 inch, so the first -- the top foot depth, unless that sample is taken after October 1st, in which case the depth of the sample -- there's an additional sample that must be taken for the 13-to-24-inch depth, so the second foot below the surface.

Q And my question maybe wasn't very good, but that was exactly what I was trying to ask, is that, if you're prior to October 1st, the depth of the soil sample is in that first foot range; correct?
A For -- generally Western Washington, yes.
Q And so when Ecology was picking the October 1st date, did you take into account sort of a normal time frame when annual crops would be harvested?
A So that date was picked out of discussions with Melanie Redding, I believe, as part of the newer groundwater literature review.

So my understanding from those discussions was there were documents that she reviewed that generally October 1st would be an acceptable date to pick.
Q Related to crop harvest?
A I don't know specifically which documents, so I would -- for crop harvest, I don't know specifically which documents, but as I said, that was, I believe, taken into account in the newer groundwater literature review, so through my discussions with Melanie on that.
Q Can we turn to Exhibit I-56, Page 9, please.

And let's see. Line 11 there, it says, "Ecology does not expect crops to be harvested at any particular time."

Let's just lay a foundation for this document before

I ask you a question about it. How about that?

So if you don't mind looking at Page 1 of I-56, are you able to find it? Sorry. It's at the very back of a very big binder.

A Yeah. Took me a while to page there, but, yes, I'm there.

Q Okay. Great. Are these Ecology's answers to the dairy farmers' requests for admissions and interrogatories?

A So this is "Appellant Washington Dairy Federation Second Set of Request for Admission Interrogatories and Requests for Production Washington State Department of Ecology and Ecology's Answers Thereto."

Q So my question was whether or not that's what these -- this document is.

Is that what this document is, Ecology's answers to our requests for admissions and interrogatories and production?

A Yes.

Q Okay. Thank you. Now let's turn to Page 9.

While you're doing that, do you recall reviewing this document previously?

A Yes.

Q Okay. And, again, I was reading Line 11 there on Page 9. Says, "Ecology does not expect crops to be harvested at any particular time."

I read this to mean that Ecology didn't take into account particular crop harvest. Is that your understanding of what this response meant?

A Let me read it here just to --

Q Sure.

A -- refresh.

Q And you don't need to read it out loud. That's fine.

A So can you please repeat your question.

Q You bet. Yeah. My question is going back to whether Ecology took into account dates that crops would be harvested when you crafted -- or when you came up with the October 1st date of the fall soil sampling.

A So --

Q And specifically my question related to this particular statement which appears to indicate that Ecology didn't expect crops to be harvested at any particular time.

A So as I think I said before, the October 1st deadline came from my discussions with Melanie about generally when, you know, heavy rains start and when generally crops could be harvested.

But this isn't to say that crops have to be harvested by October 1st. This is just a cutoff date for when deeper soil sampling has to occur after harvest in order to account for if there's been heavy rains and potential leaching in the soil profile.

Q So looking back at the fall soil sampling requirement in the permit, I'm just going to read to you the first sentence of the second paragraph there under Sub 2. Says, "Fall soil samples must be taken by October 1st after harvest of annual crops and before heavy rains begin in the fall or before any irrigation water is used on the field after harvest."

Would you agree that that statement means that, if you are not able to harvest your crops by October 1st, you would not be able to comply with that particular requirement, if you will, to take fall soil samples?

A No, I don't agree with that. Because you have to take the permit condition as a whole, not just a single piece.

And so with this condition, yes, it starts with fall soil samples must be taken by October 1st, but following that, taking the condition down and following it through, if a permittee is not able to do that by October 1st, then they can take their soil samples later.

They just have to take the additional deeper sample, and they would still be complying with the permit.

Q Thank you.

Yesterday you also testified about -- I think Ms. Barney asked you a question about anti-backsliding with regards to the soil samples. Yesterday seems like a long time ago.

Do you recall that conversation?

A Yes. I believe there was a question about anti-backsliding.

Q And I think it was in the context of moving from a two-foot soil sample to a one-foot soil sample.

Do you recall that part of the questioning?

A For --

Q Yeah. Let me maybe ask -- provide a little more foundation. You guys were talking about the 2006 CAFO permit and that it had a two-foot soil sampling requirement on the east side, and her question was whether or not moving from a two-foot soil sample to one-foot soil sample would be backsliding.

Does that ring a bell?

A Yeah. So for the east side, moving from a one-foot -- or excuse me -- a two-foot sample to only requiring a one-foot sample on the east side, would that be backsliding, and I believe my answer was yes, I believe it would be.

Q That's what I remember as well, yes.

And is that answer being driven by concerns about water quality in the sense that you want to ensure that you're collecting enough information from the soil sample to ensure that the agronomic applications are providing water quality protections?

A So I think the anti-backsliding piece is driven by -- we've had soil samples being taken in specific depth during the previous iteration of the permit, and to decrease that depth or moving closer to the surface would basically not allow us to get the same information, so we wouldn't know what the risk closer to the bottom of the crop rooting zone would be.

So, yes, it would -- it would not allow us to assess a potential risk to the environment.

Q If you could assess that risk using information from the first foot of the soil sample, would you agree that that would not be anti -- that would not be a backsliding condition?

MS. MATSUMOTO: Objection. Calls for legal conclusion.

MS. HOWARD: Your Honor, he was testifying relating to the specifics on the permit, and I'm trying to do the same, what terms in the permit would not result in backsliding.

JUDGE FRANCKS: I think he can testify about his knowledge.

A I -- generally, I understand, if there is enough information to draw such a conclusion, Ecology may make that decision, but I -- that wasn't a question that we dealt with, so I don't know if it would -- would be

considered backsliding or not at this point.

Q (By Ms. Howard) Okay. All right. I'm going to actually just direct your attention behind you to Table 3.

A Okay.

MS. HOWARD: And before we do that, can I move for admission of I-56, please.

JUDGE FRANCKS: I-56 is admitted.

(Exhibit No. I-56 admitted.)

Q (By Ms. Howard) So Table 3, yesterday you talked about this, and I believe you said that you -- these numbers here are based on Washington Department of Agricultural numbers.

Do you know if -- I'm just going to use the acronym, WSDA -- Department of Ag has this same chart that it uses?

A I do not believe Department of Agricultural uses the same table that we have in the permit.

Q And do you know if they use these exact same ranges when they're evaluating management activities that need to occur?

A So when -- my understanding is, when Department of Ag is doing an inspection, they use the same ranges as listed in parts per million in this table as part of their assessment of an operations fields.

Q Do they account for different types of crops when they're

applying those ranges? Do you know? Or -- and if you don't know, that's fine, if you didn't have a discussion, but if you do know, please --

A I do not know if they account for crops as part of that assessment.

Q Okay. I'm going to point you back to R-12, which we were talking about just a minute ago. And, yeah, let's look at Page 6 and 7. And, again, this is the OSU extension -- Oregon State University extension bulletin that we were looking at earlier.

And looking at Page 6 -- I'm sorry. I keep on saying the wrong page numbers. Page 7 and 8. I'm sorry.

Do you recall looking at these particular tables as you were developing Table 3?

A I don't recall specifically looking at these --

Q Okay.

A -- as part of development.

Q Yesterday you were asked a question about -- a few questions about groundwater monitoring, and I just want to make sure I have straight in my head how Ecology is looking at the permit terms.

So I think the questions were along the lines of, if you don't have groundwater monitoring, would you be able to know if there's a discharge occurring.

Do you remember those questions from yesterday?

A Generally.
Q Not from your counsel, from Appellant Puget Soundkeeper.
A Generally, yes, I recall there were questions about groundwater monitoring.
Q When Ecology designed the permit, did you develop permit terms that you believed would be, in and of themselves, protective of groundwater?
A Yes. Our goal with developing the permit is to be protective of water quality.
Q So if a permittee were complying with the terms of the permit, would you anticipate that there would be harm to the groundwater?
A Assuming compliance with the permit, I believe that any discharges that are occurring would. Even though they are occurring, the permit would still be protective.
Q Let's turn to another provision in the permit, if we can, to -- let me give you a page number. Let's look at R-1, and this is Page 13, S4.B. And I want to direct your attention to actually kind of the last three sentences of this permit provision, and this is talking about lagoons and construction of lagoons.

And that -- hopefully folks can follow me on this. It starts the middle of the third line from the bottom, "And there must be a minimum of two feet of vertical separation between the bottom of the lagoon measured from

the outside of the earthen liner and the water table including seasonal high water table."

Do you see that there?

A Yes.

Q And do you recall that this particular language was in the draft CAFO permits?

A This language was not specifically in the draft permits. It was added, I believe, based on comments to the final permit.

Q And do you recall what those comments were?

A Not specifically.

Q Do you know, in developing this particular permit provision, was Ecology trying to do something similar to NRCS's lagoon standard with regards to two feet of separation -- vertical separation?

A No. This -- Ecology's position, as I understand it, has always been, there needs to be two feet of separation between groundwater and the bottom of the liner for at least attenuation of the bacteria from lagoon seepage. I believe that's always been Ecology's position.

Q So -- and my question was: Were you trying to do something similar here to NRCS's standard? I think you just said no. Did I understand you correctly?

A Correct. We -- Ecology made our decision based on what our position has always been.

Q What do you mean, your position has always been? I guess I'm not following you.

Your position on what has always been?

A So the -- our position on the vertical separation between the groundwater table and the bottom of the lagoon liner. Our position has always been there needs to be at least two feet there.

And so in including this language, Ecology made our decision, not based on NRCS, but what our agency position has been.

Q In your -- this is Exhibit I-55, so I apologize again. You're going to have to flip to the very back of our binder. If you look at Page 1 --

A Okay.

Q -- this is -- it says, "Appellant Washington Dairy Federation's First Set of Interrogatories Request for Production to State Washington State Department of Ecology and Ecology's Answers Thereto."

Have you seen this document before?

A Yes.

Q Let's look at Page 9, the middle of the page, and actually, this -- let's back up for just a minute.

Interrogatory No. 3, which is -- actually starts on Page 8, we are asking, "Describe the scientific or technical basis supporting the following section of the

paragraph quoted in Interrogatory No. 3."

And then we specifically refer to Section 4B and that same language that we've been referring to here.

Do you see that?

A I see that, yes.

Q And then Ecology's answer, if you can skim down into the middle of Page 9, says, "NRCS technical guidance on lagoon construction specify two feet between the bottom of the lagoon and the top of the seasonal high groundwater table."

So would you agree that Ecology's answer to our request for scientific or technical basis for this particular term in the permit was NRCS technical guidance?

A As I understand it, looking here, that's only part of the larger answer, and --

Q That's totally fair, but I would like to just talk about what you've said was always your longstanding interpretation, and we're referring specifically to the two feet division here.

And in the answer from Ecology, you do mention two feet, and that refers back to the NRCS technical guidance.

So it appeared that that two feet separation is, in fact, related to the NRCS technical guidance. Is that a

fair summary of the answer here?
A So my understanding came from my discussions with Melanie at least about that separation, and while it is part of the answer here, I believe that Ecology's longstanding position was, again, from my discussions from work prior to this, so --
Q Ecology's interpretation of the NRCS guidance was that the two feet was from the bottom of the lagoon? Is that what you're saying?
A No. I'm saying -- I was just reiterating that I believe Ecology's position on the separation of -- from the bottom of the lagoon liner to the groundwater table, that my understanding from my discussions with Melanie is that came prior to the NRCS -- the NRCS technical guidance listed here.
Q Do you know what NRCS technical guidance's answer is referring to?
A I believe that it would be referring to -- since it doesn't specify, I believe it would be referring to an engineering specification document that's, in short, Appendix 10D of one of NRCS's design manuals.
Q Okay. Do you recall if Appendix 10D talks specifically about two-foot separation?
A I do not recall specifically.
Q Okay. Would you agree that the NRCS standard for lagoons

is an industry standard?
A Could you define please what you mean by "standard"?
Q Well, let's look at the literature review, if you will, which is Exhibit R-4.
What would -- before we do that, what would you describe as an industry standard?
A So from the permitting perspective, a standard would be an enforceable set of basically nonvoluntary language, so, like, the surface water or groundwater quality standards.
Q When you were testifying yesterday, you talked about AKART, and you said one of the considerations you take into account was that whether the technology was already being used by industry; is that correct?
A That is correct.
Q And so in that particular situation, something that's already being used by industry, would that be an industry standard?
A In that context, yes, I believe so.
Q Okay. Let's look at the literature review, R-4. This has already been admitted in as evidence, and can I point you to Page 64.
And the second line in Paragraph 1 there says, "The NRCS agriculture waste management field handbook, NRCS 2009 B, is the industry standard. It describes the

protocols and specifications for storage lagoons."

Does this seem to be indicating that the NRCS standard for waste storage lagoons is the industry standard?

A So, as it states here, the field handbook referenced is the industry standard.

Q And do you know if that field handbook relates to waste storage facilities?

A I believe it does, yes.

Q Do you recall ever having a discussion with industry about how -- what Ecology's longstanding position was as compared with the NRCS standard for waste storage facilities?

A I don't recall such a discussion.

Q Do you recall receiving any comments related to a concern about there being a distinction between Ecology's longstanding interpretation and NRCS standard for waste storage lagoons?

A No. I don't recall comments to that effect.

Q Let's turn to the document which, again, is Ecology's Exhibit -- just a moment -- R-7.

MS. HOWARD: Your Honor, before we move off of that, can I move for admission of I-55?

JUDGE FRANCKS: I-55 is admitted.

(Exhibit No. I-55 admitted.)

Q (By Ms. Howard) Does this document look familiar to you? Let me point you to a specific page to try to help you out. If you can turn back to what's called Appendix C.
A Okay.
Q It's towards the back. And it's Page 28, though I don't know if those have page numbers on them.
A Okay.
Q And does this figure look familiar to you?
A Yes. This figure does.
Q All right. And let's just for the record establish this is -- I'm just going to do a shortcut on the name of this document because it's really long, but Technical Note 716. Is that what your first page indicates?
A Yes. The cover page is South Technical Center Engineering Series No. 716. It's a technical note.
Q Is this a document that Ecology has relied upon in order to determine this two-foot vertical separation that's referenced in the permit term?
A No, I do not believe so.
Q Is it a document that you referenced in your deposition related to Ecology's longstanding interpretation of what the two-foot separation needs to be?
A I believe in my deposition I referenced -- I did reference this, though it was related to an agreement in the definition of where to start the measurement of the

distance between the groundwater table and the lagoon liner, the bottom of the liner.

Q And that is specifically the subject of this particular permit term, correct, that we've been talking about?

A The distance between the bottom of the liner and the groundwater table?

Q Correct.

A Yes.

MS. HOWARD: Okay. Your Honor, I'm going to move for admission of this document. It's R-7.

MS. MATSUMOTO: Objection. Relevance. It's from 1993 and lack of foundation.

MS. HOWARD: Your Honor -- and Ms. Barney I think also included this in her exhibits, but this particular document was also referred to by Mr. Reck in explaining NRCS's distance, how they view the distance in the liner.

And I believe we're going to get to it, that this will help us to determine Ecology's interpretation within the permit itself versus NRCS's standard, which, of course, is a key issue for us in our case.

JUDGE FRANCKS: Okay. I think it is.

MS. MATSUMOTO: Preserve our objection to having to do with Mr. Reck's testimony.

JUDGE FRANCKS: Okay. It's relevant

to Issue 19, and so I'm going to allow it.

(Exhibit No. R-7 admitted.)

Q (By Ms. Howard) I understand that you haven't had the opportunity to review Mr. Reck's testimony yet, so just bear with me, if you will.

It is Exhibit I-6, if you would like to look at it in your binder.

Let's see. Let's look at Page 62 of his deposition, and I was asking specifically a question about the same document.

So my question begins on Line 20.

"And let me -- let's maybe try a visual so we can try to explain where that is. I provided you with what is labeled as Exhibit R-7, which is South National Technical Center technical note in series 716. Are you familiar with that document?"

To which he answers: "Yes.

"Does this document have any connection to Standard 313?"

And he answered: "It does, and that is a historical document. This particular document is a predecessor of Appendix 10D."

We then labeled the exhibit.

And then if you can skip down to the question, Line 13: "And if you could turn back to Page 29 of

37" -- which he did -- "the top of that page, does it say Appendix C?

"Yes."

You can see that here. And then Line 20: "For calculation of hydraulic gradient.

"Perfect. Do you see the figure or diagram in the middle of that page?

"Yes.

"Could you explain getting -- using that diagram where the" -- I'm sorry. My questions were not great here. Excuse me. Get the right terminology there -- "the impoundment bottom, right, the elevation?

"Yes. On that figure Appendix C."

And then we specifically were asking him: "Yes, if you could look at the figure, there's two points that are -- that are located. There's a Point 1. There's a Point 2.

"Point 1 is the top of the clay liner and Point 2 is the bottom of the clay liner." So this is Mr. Reck explaining that.

And so then skipping down to Line 23, it says: "So that Point 1" -- and just for reference, can you see Point 1 on Appendix C?

A Sorry. I put that exhibit away. Which exhibit was that?

Q R-7.

A Okay. Thank you. Okay. Yes. Point 1.
Q Yeah. Do you see it on Exhibit R-7, Appendix C?
A Yes.
Q And is it at the top of what appears to be the lagoon liner?
A Yes. In this diagram, there is a Point 1 at the top of the impervious clay layer.
Q And I think Mr. Reck in his testimony referred to that as the impoundment bottom elevation. Do you see that in -- again, we're flipping back and forth here; I apologize -- but I-6, Page 64, Lines 23 through 25.

So the question there is: "That Point 1 would be -- is that Point 1 what you would call impoundment bottom elevation?"

To which he says: "Yes. Point 1 would be the impoundment bottom."

Do you see that? Again, I'm looking at the bottom of Page 64.

A Oh, okay. Yes.
Q Line 23: "So that Point 1 would be -- is that Point 1, though, what you would call the impoundment bottom elevation?"

To which he referred: "Yes. Point 1 would be the impoundment bottom."

Do you see that testimony?

A I see it here.
Q Okay. And is Point 1 the -- what Ecology would refer to as being the bottom of the lagoon liner?
A No, we would not.
Q Where would Ecology want to establish this two-foot separation from, if you could, just using this particular diagram in front of you?
A So on this diagram, below Point 1, outside the liner, there should be a small No. 2 that is outside the impervious clay layer as referred to, that would be the point where we would start the measurement for the two feet of vertical separation.
Q There should be a pointer next to you. Would it be helpful? Could you just point that out on the diagram.
A I don't want to hit somebody in the face. So that should be right there if my hand will hold still at all.
Q And typical liner, I think you said yesterday would -- you would expect to be about a foot in size; is that correct?
A I don't believe I referenced a thickness of the liner.
Q What would be a typical thickness of a clay liner? What would you expect in a lagoon?
A I think that's really going to depend on the soils that are used in a location of the lagoon, so I don't have a -- I don't have a standard thickness.

Q Would you agree, though, that Ecology's permit provision for the distance between -- let me ask that better.

Would you agree that Point 1 and Point 2 are not in the same location?

A Yes.

Q And so irregardless of the thickness of the liner, which I believe is that space in between of Point 1 and Point 2, would you agree with that on this diagram? That is the liner?

A Yes. I believe that's -- that's labeled little D in this diagram.

Q Perfect.

A The thickness of the liner.

Q Thank you. So irregardless of the space, would you agree that where NRCS is looking for the separation between groundwater and where Ecology is looking for separation from groundwater and the permit terms are different?

A Based on this, yes, they are different.

Q Okay. And you haven't reviewed Mr. Reck's testimony; is that correct?

A No. This is the first time I've seen it.

Q Okay. And do you recall, again, specifically having a discussion with anyone about how Ecology interprets where the separation -- vertical separation needs to be and where NRCS lagoon standard looks for a vertical

separation?

A So the conversations I had about this were with Melanie Redding about where Ecology -- basically Ecology's longstanding position that -- of where to measure from the outside of the lagoon liner to the top of the groundwater table, and I believe discussion of the NRCS practices came up during that.

Q This question is specific to permits related to animal waste storage.

Are you aware of any permit that Ecology has issued that includes this same language as the general permits related to the two-foot separation?

A No. I'm not familiar with any permits that include -- there's lot -- Ecology has issued quite a few permits and I'm not familiar with any of those enough to say whether similar language is included.

JUDGE FRANCKS: Ms. Howard, it's coming up to the noon hour, so I'm wondering how much more you might have.

MS. HOWARD: I don't have anything else. I am done.

JUDGE FRANCKS: How's that for timing.

MS. HOWARD: Oh, you know what? Let me make sure -- I guess at this point, can we move to admit Mr. Reck's testimony as an exhibit, Exhibit I-6?

Do we need to do that at this point? I think you've already sort of ruled that it's in as an exhibit, but --

JUDGE FRANCKS: I have, but let's go ahead and move for its admission.

MS. HOWARD: Move for admission of I-6, which is the designated deposition transcript of Mr. Reck.

MR. SNYDER: Your Honor, same objections we've had previously. Late notice of the deposition, unreasonable timing, undisclosed expert testimony, and it's outside the scope, and finally the objections contained in our letter all for preservation.

JUDGE FRANCKS: Yes. And I ruled already that the deposition as designated is admitted.

With that, let us go to lunch and return at one o'clock. Thank you. And we're off the record.

(Recess from 11:56 a.m. to 1:00 p.m.)

JUDGE FRANCKS: Have a seat. Okay. Let's go back on the record. So, Counsel, are we at the board questions stage or is there some sort of redirect that needs to happen?

MS. BARNEY: I believe we're at the board question stage.

JUDGE FRANCKS: All right. Board

members, who wants to go first? Who's ready?

EXAMINATION

BY MR. WISE:

Q Good morning. Good afternoon I guess it is.

I don't know a lot about manure lagoons. What keeps the water in them, or the liquid?

A So manure lagoons, generally talking earthen lagoons, which are essentially compacted earth and clay structures, and it's the compaction of the earth or the clay in many cases, the liner, that initially reduces the permeability and causes it to retain liquid.

Q Is that just a natural occurrence or is there something you put in the lagoon to keep it from leaking?

A So initially, when the lagoon is built, it's going to be -- to have a permeability, and then there is some additional sealing that takes place from the fine particles from the manure that's contained in there, and that additional sealing decreases permeability further than from the initial design and construction.

Q So do operators normally ever put anything in if there's leakage to stop the leakage?

A Not that I'm aware of.

Q Okay. So there's like -- there was testimony about these artificial liners and all that. They -- the operators don't use those?

A There are what I'll call geotextile or plastic liners that can be used. There's, to my knowledge, very few that are actually being used in Washington, but those are -- those would be a liner that's put in when the lagoon is constructed versus after the lagoon is already in use.
Q So do they ever use bentonite?
A I believe that may be one material that's used and mixed into the soils when the actual structure is being constructed.
Q Is the lack of a liner primarily a cost consideration?
A The lack of the liner for the current lagoons or for, say, new construction?
Q Well, new construction. I mean, why don't people put in some kind of a liner?
A Generally, cost is a big factor of that. They are -- lagoons themselves are expensive to construct, and then the additional of a plastic liner, if you will, adds a significant additional cost.
Q Does Ecology consider some kind of a liner a requirement under AKART?
A For new construction, we just consider the soil and earthen liner, as long as it meets the one times ten to the minus six centimeters second permeability, we would consider that AKART for the newly constructed lagoons or

in the permanent refurbished lagoons if they're rebuilding them.

Q So it sounds like even your standard allows some leakage. That's not a concern?

A So, yes, our standard does allow some seepage from the lagoon. That's part of the design. And I don't believe that -- assuming the operation is in compliance with its permit, I don't believe that's a concern.

Q If a CAFO was out of compliance with the permit, how would you know?

A So that would really depend on the condition they're out of compliance with, and largely that would be found through inspections, the routine inspections, that Department of Ag does for us.

Also it could be found through complaint response or -- well, complaints that Ecology receives through our complaint system, also through the reports that are required to be submitted by the permittees. There's an annual report that's required.

I believe, you know, also that, you know, there's visual inspections that are required to be done by the CAFO on -- depending on which part of the CAFO, you know, there's visual inspections that have to take place on either a daily or weekly or monthly basis, and then records of that, which would be viewed during

inspections, or Ecology could also request those records.
Q You mentioned an annual report. Do the CAFOs self-report on violations?
A They are required to, yes.
Q And if you suspected a violation at that point, would there be some sort of sampling done to determine the extent of the pollution?
A I think that would really depend on the circumstances of the violation.
Q Okay. The NRCS technical notes that we've been looking at, are those federal law? Are they legally binding?
A No, they are not. Those are guidance documents that are used primarily during voluntary work with operations that come in for technical assistance.
Q And can you explain to me the connection between the CFRs we were looking at and the CAFOs? Are those federal regulations binding on all the CAFOs?
A Yes. So the Code of Federal Regulations are the federal rules that are in place for permitted CAFOs.
Q And Ecology considers their permits in compliance with the CFRs?
A Yes.
Q You mentioned that an SBEIS was done. Is that correct?
A Yes.
Q And just for the record, what's the purpose of an SBEIS?

A So the small business economic impact statement or analysis looks at the -- it's required by our permit development code, and it looks at the potential impact to small businesses from proposed permit conditions and potential mitigations for those.

Small businesses in this case being businesses with 50 or fewer employees.

Q Do you remember if the EIS determined that there was a disproportionate impact to small businesses?

A Yes. I believe for this, there was -- we did determine there was a disproportionate impact. And so for small businesses, we included different requirements for when those businesses would need to apply for a permit.

There are additional steps Ecology would have to go through before they're required to be permitted.

Q And that was to be mitigation for the disproportionate impact?

A Yes.

Q Last question, was SEPA done on these permits?

A I believe that -- no. We don't have a SEPA determination. I believe that SEPA -- the re-issuance of the permit was exempt from that. I don't recall off the top of my head the exact reasons for that exempt.

Q But it's under one of the categorical exemptions under SEPA?

A I believe so, yes.

MR. WISE: Thank you.

EXAMINATION

BY MS. BROWN:

Q So just to follow up on Mr. Wise's question about the manure lagoons and the liners and the -- you know, what holds the water in without a liner, and I understand it's compact earth or clay-type thing.

So now my question is: Well, so if you're measuring where the bottom of that is, how do you know? How do you tell where the bottom of an earthen thing is?

A I'm certainly not an expert on lagoons. Melanie may be able to answer your question better.

Q Okay.

A But for my understanding, where you have a distinct clay liner, as part of building a lagoon, that liner would be measured, the thickness of it, as it's compacted into place.

Q Okay. But it's still -- it's not like a separate piece of material? It's just a different kind of dirt?

A Yes. It's not an artificial, like, plastic that's laid down. It would -- when the lagoon embankments are compacted into place, the -- then the clay for the liner would be compacted on top of that.

Q Okay. Okay. So I have a note to myself, and I'm not

sure if I can recapture this at this point, but I noted that you said that Ecology made a different decision than where you would have been guided by that Tech Note 23 on lagoons, the higher risk ones.

Does that question make sense?

A Okay. I believe that would be in reference to in Tech Note 23, there are four categories which are outcomes of the assessment, 1 through 4, and then other than Category 4, Categories 1 through 3 have three subcategories, if you will.

And for some of the subcategories for the main Category 2 result, NRCS guidance in that document says that they suggest that that lagoon should -- that that lagoon should not be used until deficiencies noted in the assessment are fixed.

That is the guidance that NRCS provides in that document. Ecology chose not to follow that guidance.

Q Okay. That's helpful background. Thank you.

So I was wondering then, why did Ecology choose not to follow the guidance? What was the reason?

A As I recall about discussions in Tech Note 23, the deficiencies noted in Category 2 are what were considered in the guidance minor, and so we felt that minor deficiencies could be, you know -- we would focus on the major ones instead --

Q Okay.
A -- because those would be of higher risk.
Q Okay. And then my last question: I'm getting the impression that there are a lot of cattle, dairy, particularly dairy operations out there that aren't applying for coverage under the general permit. And I'm sort of coming to the assumption that that's because they don't have discharges.

Is that why -- why is there that difference? Because I think it's something in the technical definition of the CAFO who has to apply.

A Right. So for a facility to be defined as a CAFO, the way it's laid out in the permit, we have a different definition for a small CAFO versus just a CAFO.

For a CAFO, you have to have animals that are confined for 45 days or more during a 12-month period in an area where there's no crop residue or pasture essentially, and then that facility has to have a discharge.

Now, I can't speak for all the facilities out there. However, I think, based on my experience, getting facilities to apply for a permit is -- and the lack of facilities applying for a permit, I think, is very much probably similar to other permitting activities where some folks do come in the door voluntarily. Some folks

do come in the door after discharge.

But, you know, there's going to be various groups that don't come in the door unless, you know, Ecology pursues them for a discharge.

Q Okay. So most of the other operations that are out there, there's a lot of them that meet the requirements for applying for CAFO except the question about whether they have a discharge or not? That's the part where they're saying they don't need to apply because they don't have a discharge?

A I would say that, yes, I mean, to require a permit, there has to be a discharge.

Q Okay.

A And so I'm -- I believe that there are facilities out there that are not having discharges, and so they aren't required to apply for a permit.

But, again, I think there are probably facilities out there that may meet the definition because they've had a discharge and that either they just haven't applied or, you know, Ecology, you know, hasn't followed up with them.

That said, there are a number of facilities that Ecology is following up with that have had discharges to get them under permit coverage for discharge.

Q So how many -- what was the numbers again about how many

are or have applied under this -- the new permit now?

A So there's approximately 23 permittees in the last time I looked.

Q Okay.

A Roughly I would say half to two-thirds of those are new since we've issued these new general permits in 2017.

Q Okay.

A And then we do have about ten to twelve operations that we are in the process of getting to apply for a permit or that are in the application process.

Q Okay. So do you have any idea of the numbers that are out there that would meet everything, all of the other requirements of the CAFO permit except the discharge piece, assuming you can't tell that one way or the other?

I mean, are there a lot of operations that have these types of numbers that would -- you know, numbers of animals that would meet this requirement?

A So because there is a dairy program, we have a better idea for dairy operations.

Q Okay.

A I think the last time I looked, there was roughly between 420, 450 dairy operations in the state. Those operations, of course, are spread across small to large facilities.

I think there were roughly -- in about 200

facilities -- maybe 2- to 250 facilities that we would consider a CAFO under the permits just based on size --

Q Mm-hm.

A -- not that they've necessarily had a discharge, and then the rest of those facilities would be small, which would fall under the small CAFO definition if they'd had a discharge and Ecology pursued that.

For nondairy operations, Ecology doesn't have a good list of those facilities. Mostly we find out about those through other work that Ecology is doing, say point source work or through complaint response through complaints that we've received.

Q Okay. And do you have very many of the nondairy people that have applied for this permit?

A So let me see here. I believe we've had four. There were four beef operations that were covered under the 2006 permit.

Since we've issued the 2017 permit, there is one poultry operation that has applied for permit coverage and also one heifer raising operation that's applied for permit coverage.

There was a unique situation in the 2006 permit where another poultry operation was covered by that 2006 general permit, as well as an individual permit. That poultry operation has moved completely over to the

individual permit, so I'm no longer counting that under the general.

MS. BROWN: Okay. Okay. That's helpful. Thank you.

EXAMINATION

BY MS. MARCHIORO:

Q So in terms of the Table 2 of the combined permit, which sets out the -- you don't need to look at it. I bet you memorized it -- has to do with the sizing and what's a small CAFO and what's the large CAFO? Where does that information come from to create that table?

A Okay. So Table 2 is based upon the federal definitions of a CAFO. I can't provide you the exact Code of Federal Regulation off the top of my head, but the federal -- the Code of Federal Regulation lays out a decision for three different sizes of CAFO: small, medium, and large.

They very much mirror the -- well, the permit very much mirrors the 45 days of confinement and basically non-pasture non-field areas. And what we did is, we simplified the definition down to two categories because really the difference in the federal rules was animal numbers.

So for a large or medium facility to be required to get a permit, they have to have a discharge. The only difference in the federal rules was that a large

facility -- which is just automatically classified as a CAFO. A medium is not.

So a medium size facility would be classified as a CAFO if it's -- has a certain number of animals and has a discharge.

A large size facility would have been -- is classified as a CAFO just based on the size -- the number of animals alone, but even with that classification, it's not required to -- such a facility is not required to obtain a permit unless there's a discharge.

So because of the -- there really wasn't a difference. In order to simplify terminology, we just broke things into two categories.

Q So in terms of the discharge, if a lagoon is designed to seep, is that not a discharge if it's -- where it would eventually go is to the groundwater table?

A So if lagoon seepage does reach the groundwater table, that would be a discharge that requires a facility to obtain permit coverage.

Q And the way that would come to light would be someone taking a groundwater sample and finding out that there's nitrate -- let's use that as an example -- at high levels in close proximity to a CAFO?

A Groundwater sampling, I believe, would be one way for determining that.

I think in some of our permit implementation discussions, we've talked about how you could also make that determination based on a predominance of evidence in terms of things like length of time that a lagoon has been in place, what the known groundwater table is, other soil characteristics.

But that's -- that's really an area where Melanie would have to answer better than I could about what would go into that.

Q So going back to the schematic of the lagoon, discussing in terms of if it's two feet of separation -- let's just say, for sake of argument, that where the Point 1 was and there was the clay layer and there was Point 2, let's say that clay layer is a foot, it makes a difference whether you're measuring your two-foot separation from Point 1 or Point 2, doesn't it?

A Yes, it does.

Q Okay. And can Ecology be more protective of groundwater than, say, the NRCS?

A Yes, we can.

Q And then back to the -- when you decide to take -- when the permit has requirements for the soil sampling, I'm just trying to understand the timing question which seems to be of interest.

If -- is that your understanding of the issue? Is

it that it's difficult to go out when a crop is still on the ground to take a soil sample to meet the October 1st, for example, or is it really more an issue of, if you go when there's winter rains, that let say there's nitrates on the surface, they'll end up going farther into the soils, that might change the nutrient budget.

I'm just trying to understand what the concern is.

A So I think there's two concerns. One is that taking a soil sample when a crop is on the field can lead to crop damage because you have to take subsamples around a field in order to form, based on the permit requirements, a composite sample that represents the field.

So there is concern about the crop damage from that equipment on to the field. In addition, for Ecology, our concern is, yes, we want the sample taken prior to rain starting because, in this example, nitrate would move with that rainwater that's going down into the soil profile and change the outcome of our fall report card samples.

Q Would it possibly dilute them? Might be results so that your feedback would be that there could be a higher application rate the following year?

A Yes.

Q Okay. So EPA reviews the draft permits?

A Yes. EPA has an opportunity to review the draft permits

before they're issued.

Q Did EPA have any comments about the incorporation of the nutrient management plan, those elements into the permit? Did they have any commentary back to Ecology about that approach?

A I don't recall comments to that effect.

MS. MARCHIORO: Thanks.

JUDGE FRANCKS: Okay. Follow-up to board questions?

MS. BARNEY: None from Ecology. Thank you.

MS. MATSUMOTO: We have a few.

JUDGE FRANCKS: Okay.

FURTHER EXAMINATION

BY MS. MATSUMOTO:

Q Mr. Jennings, Board Member Wise was asking you a bit about liners in lagoons and some synthetic liners and whether there were cost concerns.

Are you familiar with waste storage ponds and lagoons that are used in other industries?

A No. That's -- I don't have familiarity with those.

Q You didn't ever consider what other industries do for storage ponds when you were looking at storage ponds for this permit?

A Other -- no. I mean, we were focused on the CAFO

industry.

Q And, similarly, there was a question about how would you know if a facility was out of compliance with the permit, and so specifically, if you wanted to know whether a facility was exceeding groundwater effluent limitations, how would you know that?

A So you're referring to the section of the permit that references the groundwater quality standards; correct?

Q Correct.

A Okay. So to actually know what's in the groundwater, you would need to sample -- sample that groundwater and have it analyzed.

Q Okay. And there was -- I think you also mentioned that one way Ecology might learn of compliance issues was through the required annual report; correct?

A I see that as a potential avenue of finding out about the compliance issues.

Q And those compliance issues could include discharges that aren't authorized by the permit; correct?

A Yes. Well, I believe there is a section on the annual report that is where a permittee is required to list the discharges that have occurred throughout the year.

However, I think, if the discharge is actually noncompliance with the permit, we should have found out about it sooner. There's a noncompliance reporting

section of the permit where permittees are required to report on noncompliance.

Q But since the annual report is a self-reporting requirement, that only would apply to a CAFO facility that actually has permit coverage; correct?

A Correct. The permit would only apply to those facilities that have permit -- have been issued permit coverage.

Q And so when Board Member Brown was asking you just kind of about the numbers of facilities in the state, total numbers of CAFO, setting aside the question of whether or not they've had a discharge, if there are any of those facilities that qualify as a CAFO but don't have permit coverage, they don't have to submit an annual report to you about discharges to groundwater, for example, do they?

A No. So any facility that doesn't have permit coverage is not required to comply with its requirements.

Q Right. And as you said in response to the questions about numbers, aren't there over 500 of those facilities in the state?

A I don't know that there's that many. I think I referenced around 430 to 450 dairies, and then we don't have a good number for the other types of facilities.

Q Board Member Brown also was asking you some questions about measuring the bottom of the lagoons, and in order

to -- you said that one way you might know where the bottom of the lagoon was, was from some records about the compaction when the lagoon was being put in; is that right?

A Just based on the understanding I have that, yes, there may be records from how the lagoon was built that would tell you where the liner is.

Q Okay. And so that's information that can only be known then if it's, say, a new lagoon that someone is present and documenting the installation or if there are records that actually exist to reflect any type of liner depth; correct?

A So new lagoons may have that documentation, but permittees, if they don't have that documentation, would need to obtain it as part of their lagoon assessment, I believe.

Q So if some of these lagoons have been around for many, many years and it turns out the documentation doesn't exist, how would a permittee be able to obtain that measurement?

A That's not really my area of expertise. My guess is that a permittee would need to hire a consultant that does have expertise to determine that information.

Q And in terms of the number of facilities that are being covered, you had kind of been making a distinction about

the question of whether or not a discharge exists kind of as an additional question on top of whether the CAFO numbers are satisfied. Board Member Marchioro was directing you to Table 2 and the numbers listed there; correct?

A Yes.

Q As we've also discussed and seen in various evidence, Ecology has recognized and you've just stated a moment ago about how every lagoon discharges; right? They're designed to have some type of leakage rate?

A I believe I stated that lagoons, as they're designed, have a seepage rate. I don't believe I stated that they all discharge.

Q So if a facility has a lagoon and it's one of these lagoons that is designed to leak, shouldn't they be obtaining permit coverage?

A Again, that depends on whether there is actually a discharge taking place. Yes, there is most likely seepage, but my understanding is that seepage may not always reach groundwater.

There may be circumstances where that seepage doesn't reach groundwater, so we can't make a blanket statement that all lagoons are automatically discharging.

Q So what are the circumstances where a lagoon that is designed to have a leakage rate would be leaking and

there would not end up being a discharge to groundwater?

MS. HOWARD: Your Honor, I'm going to object. The witness has testified a couple times this is not necessarily in his area of expertise, and I think he's -- there is a foundation for the question that's being asked as a result.

JUDGE FRANCKS: I'm going to overrule the objection. I'm going to let him answer that, but I think we can probably move on.

A So generally, I think circumstances where you have a lagoon, if it has seepage but groundwater is a very long ways down, it's conceivable that that seepage may not reach groundwater or, you know, a situation where I'm thinking, you know, the lagoon was built and happened to be over really high clay soils, which, you know, clay is used to limit the permeability of the lagoon itself, so in such a situation that -- that seepage may not actually reach groundwater.

Q So where would it go in that case?

A That, I -- that, I don't really know.

MS. MATSUMOTO: Okay. That's it.

JUDGE FRANCKS: Ms. Howard.

MS. HOWARD: Thank you.

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FURTHER EXAMINATION

BY MS. HOWARD:

Q Just one quick clarification. With regards to liners, are clay liners a type of liner?

A Yes, I believe so.

Q And are clay liners a type of liner that is used in a lagoon in animal waste storage lagoon?

A Yes. They are one of the liner types.

Q Okay. So it's not necessarily correct to say that, without a clay liner, there is no liner in a lagoon?

A I believe I used clay liners to try and describe, but there are lagoons that are built just with soils that has been amended with clay to increase the clay content.

So I don't think -- so in those circumstances, I don't think there's a distinct clay layer that you would call a liner.

Q Is the area that you would call a clay liner a compacted area of soil?

A Generally, yes. I think the clay liner, that area, is compacted, and that's how the permeability is achieved as part of the structure.

Q And in order to achieve a certain permeability rate, would you also have to add bentonite, for example, in order to achieve a certain permeability if you weren't already achieving it with the natural soils?

A Yes. Clay -- the soils of the structure, clay would be added to those, amended and mixed in order to increase the clay content, which, when compacted, would lead to the desired permeability.

Q Have you ever actually observed a clay liner on an animal waste lagoon?

A Not that I -- not that I would -- had knowledge of.

Q So you said earlier that you didn't think that you could discern the difference between a liner and the other soils, but you actually haven't observed that yourself; is that correct?

A I have not observed a clay liner as a component myself. I'm going on -- based on diagrams that I've seen.

MS. HOWARD: No further questions. Thank you.

JUDGE FRANCKS: Okay. Thank you very much. You're excused.

Ms. Barney, do we have another witness?

MS. BARNEY: We do. Ecology calls Melanie Redding.

MELANIE REDDING, having been first duly sworn by the Certified Court Reporter, testified as follows:

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DIRECT EXAMINATION

BY MS. BARNEY:

Q Good afternoon, Ms. Redding.

A Good afternoon.

Q Would you please say and spell your name for the court reporter.

A Melanie Redding, M-e-l-a-n-i-e, Redding, R-e-d-d-i-n-g.

Q And let's turn to Exhibit R-25. It will be in the green binders.

A Oh, there it is. Sorry.

Q It's all about binder management.

A Okay.

Q Do you recognize this document?

A I do.

Q Can you tell us what it is, please.

A It's my most current resume.

MS. BARNEY: Ecology moves for the entry of R-25.

MR. TEBBUTT: No objection.

JUDGE FRANCKS: R-25 is admitted.

(Exhibit No. R-25 admitted.)

Q (By Ms. Barney) We're going to review some of the aspects of your resume here.

Can you tell us what your educational background is.

A I have a bachelor of science in environmental geology.

Q And when did you gain that credential?
A 1986.
Q And where are you currently employed?
A Washington State Department of Ecology.
Q How long have you been at the Department of Ecology?
A 1991.
Q And what positions have you held there? You can start with the earliest and move us forward.
A I've always been employed as a hydrogeologist. I started off in the water quality program, and my first job was -- the groundwater standards had just been adopted, and I was hired to write the implementation guidance for the groundwater quality standards.

And then once that was completed, I moved down to our Southwest Regional Office, and I assisted with permit development on any kind of permits that had a groundwater component to them.

And then about 15 years ago, I moved up into our environmental assessment program, which is essentially like our research part of the agency. And I've been working on projects to help assist the rest of the agency with science-based questions or issues.
Q Okay. So looking at the portion of your resume, about the middle of the first page here, it says "significant initiatives."

I think you just mentioned the implementation guidance?

A Yes.

Q We'll talk a little bit more about that in a minute.

Could you tell us about Bullet Point No. 2, "Lead responsibility for resolving program policy issues to protect groundwater"?

A Yes. I took on -- I was actually designated in my position description as an expert for land treatment systems.

So I was involved with trying to manage issues related to, like, food processors and how they were land applying their wastes, on-site sewage systems and how their disposal mechanisms were consistent with the groundwater quality standards.

So I touched on a lot of different kinds of issues that were related to groundwater quality in that position.

Q Okay. Thank you. If we look at the top of Page 2 of your resume, under "Selected Publications," the one on the top there is titled, "Literature Review Manure and Groundwater Quality"?

A Yes.

Q Could you please pull up Ecology's Exhibit E-4. It might be in a different notebook than that one, one of the ones

behind you. I guess it's R-4. Sorry.
A Okay. Got it.
Q Can you take a look at the first page of that document.
A Yes.
Q Is that the -- is that the literature review you're referring to?
A It is.
Q What was your responsibility with regard to writing this literature review?
A At the time I was working for the environmental assessment program, and we had a request from the water quality program to look at some of the science behind permitting CAFOs, specifically how manure relates to groundwater quality.
Q And when did you begin your work on the literature review?
A I believe it was proposed in 2011, and then I think it got started about 2012.
Q And what specifically did your work entail?
A So as part of when they ask us to do something, they prepare a scope of work, and they --
Q Just to clarify, when you say "they" --
A Oh, water quality program.
Q Okay.
A They told me specific issues that they were interested in

having a better understanding of the science and what the literature said, so it had to do with, like, soil nitrate values, land application. There was just sort of a list, and pretty much those issues are reflected in this document.

Q So what literature did you include in your review?

A There's a section called "Methodology" in the document, but essentially what it is -- it's fairly early on. Methods, Page 14. Essentially we looked at peer-reviewed journals.

Q This will be Page 16 of the PDF, for people's information.

A It says Page 14 on this document.

Q Oh, does it? Sorry. And you're right. Sorry. My error.

A So essentially we looked at peer-reviewed journals. We looked at scientific papers by other state agencies, universities, or even information that came from reputable sources like the NRCS, other kind of institutions like that.

Q Were there -- was there literature that you found that you ended up not including in the review?

A Yes. We did not include raw data. We did not include personal opinion. We did not include incomplete studies. And the direction that I was given was very clear to

me, was, we want to know what the science says. Plain and simple. We want to know what the science says.

So that was my basis for moving forward with this document.

Q Did the review itself undergo peer review?

A Yes. It went through a couple of internal reviews, and then it also went through an external peer review.

Q And who were your external peer reviewers?

A So that's in the acknowledgment section, but it was Pony -- or Charles Ellingson -- he also goes by the name of Pony -- from Pacific Groundwater Group, and Ralph Fisher with EPA.

Q And how many times did you undergo an internal peer review with the document?

A So there was probably two rounds of internal peer review, and then there was comments also designed on trying to help improve the organization of the document, readability, that kind of thing.

Q Did you incorporate comments that you received from your peer review?

A Oh, absolutely.

Q Okay. So how long, approximately, from the start of your publication until it was ready for publication by Ecology? How many years?

A It was about four years.

Q Okay. Did you work at all on the 2006 CAFO permit?
A No, I did not.
Q Was producing the literature review the only involvement you had with the permits that are under appeal?
A Well, that was -- that was sort of -- that was sort of my -- that was what I was actually tasked to do, was to write this document, to provide the science.

And beyond that initially, I was just providing comments on the draft permits, but then after the final draft permit, I believe it's called, after that went out for review and we got all the comments back, Bill Moore from water quality approached my supervisor and asked for more time to help with response to comments from a technical perspective and then help with revising permit conditions to make sure that we got the technical aspect in.

Q So did you participate in the development of any of the specific aspects of the conditions that are in the permits?
A Yes, I did.
Q Do you recall in what areas you provided or that you worked on the development?
A Do you want me to go through permit piece by piece or just in general?
Q Just in general.

A So I worked -- the adaptive management matrix, I provided comments on that. The timing issue, provided comments on that.

Boy, it seems like -- you know, the permit is -- it all works together, so there was some different pieces that I worked on that it's all -- it all kind of works together, so that's kind of tough to say.

Q When you say you worked on aspects of it, did that involve just commenting on documents you received or did you actually have actual input?

A So it was a combination of both. And I did work fairly closely with John and also Bill. And then after the draft permit, after we got the comments back, then I was working with John's internal work group, so --

Q Okay. Thank you.

Since you mentioned the adaptive management matrix, let's start with the land application of manure as a topic.

A Okay.

Q Let's see. Can you turn to Exhibit R-5, please.

A Got it.

Q Do you recognize this document?

A Yes, I do.

Q Can you tell us what this is?

A This is the Implementation Guidance for the Groundwater

Quality Standards.
Q And did you state earlier that this was one of the documents that you authored for Ecology?
A Yes, it is.
Q And when, again, was that?
A It was 1996 that I completed this document.
Q Has it been updated since then?
A It was revised in 2005, but my recollection of this document being revised was that they only revised Appendix A essentially to update the criterion, though the -- as those had been updated through EPA or Washington State Department of Health.

And then I believe they also updated like the PQLs, which are essentially the laboratory requirements about, this is as low as we can detect when we're actually looking for this constituent in water. So those kind of things were updated.
Q So in terms of land application, what is the purpose of land application?
A Land application, a better term for that are -- is really land treatment. So it's when you're -- when you've got material, and you're trying to treat it by use of either a crop or the soils, that's considered land treatment.
Q How is it a treatment?
A So there's nutrients that are -- so let's say manure, but

it also holds true for food processing waste. There's nutrients in that waste.

And it can be used to beneficially grow a crop. So you're treating that waste. You're using those nutrients, and you're also getting a crop out of it.

So it's kind of a nice win-win situation.

Q Could you turn to Page 14 of the document, please. You'll see a diagram at the top.

A Okay.

Q Oh, it's Page 2 of the document. I'm sorry. It's Page 14 of the exhibit.

A Okay. Got it.

Q Could you explain this document to us, please.

A So this is essentially, like, a cross section of what you would see if you were to cut the earth open, and at the very top you have the land surface, and you'd have a crop and those are cats.

And so then you have -- beneath the land surface, you have the root zone, and then part of the root zone is also in the vadose zone. The vadose zone is essentially the unsaturated zone.

Q And what does that mean?

A It means that you've got water that may be present in there, but until it's saturated, it will only move under -- through -- through gravity and matrix forces.

It won't actually move horizontally. That only occurs once you've got saturated conditions.

So it's not considered groundwater unless you've got saturated conditions.

Q What else can you tell us about this diagram?

A So the interesting thing about what you do with the land surface, there's -- what you do at the land surface, like, say if I were to apply potato processing wastewater at the land surface today, whatever doesn't get used by the root zone will take a while to move through the vadose zone because it's moving very slowly, and it only is -- like with nitrate, it's only moving with water.

So it's going to take a while to move through the unsaturated zone until it reaches groundwater. Once it reaches groundwater, it depends upon the conditions of the aquifer as to how long it will actually take until it gets to a monitoring well or a drinking water well.

So there's -- what we call is a lag time between what you do at the land surface and when you see it in groundwater.

Q So will that water always reach groundwater?

A So when you apply water, it's -- if it's in the root zone, chances -- it's got an opportunity to be used by the crops, by the roots uptaken by the plant.

And that's really what we want to see when we're

dealing with these land treatment systems. We want to keep the water in the nutrients in the root zone so it's available to the crop.

Once it goes beneath the root zone, at some point, it's most likely that that water will reach groundwater.

Q And how long will that take?

A It's really site specific because it depends upon what the media is in the unsaturated zone and in your aquifer, so it's really a site-specific thing.

Q Are the land application areas of a CAFO significant in their role as a treatment?

A I'm not sure I understand your question.

Q So a land application area on a CAFO --

A Mm-hm.

Q -- is that -- is that a significant area if you're looking at the role of the land application as treatment?

A Oh, I see what you're saying. So the question is, is the land application like a significant part of their -- what they're doing on their -- on their operation?

And if we were to go back to the literature review --

Q We can do that.

A Okay.

Q It's R-4.

A Thank you. So one of the things that we did -- I've done

some work up in Whatcom County in the Sumas-Blaine Aquifer, and I found a document that was done by Almasri, and -- where they looked at the loading from different kinds of sources that was happening in the Sumas-Blaine Aquifer, and that's on Page 21. Yeah. That's it.

So what these researchers did is, they looked at all the sources, and they broke them out into percentages, and there's even a table that breaks that down further on the next page.

But the thing that I think is most important is, they identified that dairy lagoons contribute 2 percent of the nitrogen over the Sumas-Blaine Aquifer, and that manure provides 65 percent of the potential nitrogen load that's being applied to the land surface.

So land application or the land treatment part of the facility is really a big part of a land treatment system.

Q So just to clarify that, so dairy lagoons are storing manure; correct?

A Correct.

Q And what this 65 percent we see here for manure, that's a manure attributable to land applications?

A Correct.

Q Okay.

A And it's a loading, and there's a difference between

loading and what actually goes to groundwater. So this is loading to the land surface.

Q So what is that difference then to what actually ends up going to groundwater? What are the factors that would affect that?

A Well, it really depends on what the crop doesn't use, what is actually leached below the root zone and then continues to migrate to groundwater.

Q Okay.

A And just to -- so if we go to the table on Page 22, this, I think, also might help explain the difference in the percentages between the lagoon area and the land application area because the dairy lagoons the nitrogen loading might be -- look like it's actually higher.

But when you do it in terms of acreage, what is the amount of area that a lagoon covers compared to land application? It's very, very small.

So that explains the difference between when we're looking at lagoons and what are they contributing to the environment versus a land application field.

Q So in order to be a proper treatment system, the plant -- the application has to be planned so the plants uptake the majority of the nitrogen?

A Correct.

Q Is that how that goes? So what needs to be considered

when an operation is planning manure applications?

A So the NRCS has something called the four R's, and I know I'm going to get this wrong, but some of them have to do with the right amount, the right time, the right area. I can't remember what the fourth R is.

But that really holds true when we're trying to figure out, like, how to really maximize the land treatment system so it's keeping the nutrients in the root zone.

And I think one of the things that's really important in the permit is, we have a nutrient budget that is in the beginning of the -- that's taken in the spring to actually tell the producer, the permittee, what is available right now? And then using that to say, well, what -- what do I need to amend it with? How much can I apply?

Those are the kind of things that I think are really important.

Q Could you look at Exhibit R-15.

A Got it.

Q Can you tell us what this document is.

A This is a document called "Nitrogen Dynamics at a Manure Grass Field Overlying the Sumas-Blaine Aquifer in Whatcom County."

It's an Ecology publication, but it was written in

conjunction with Joe Harrison, who is with the WSU.

Q And are you familiar with its contents?

A Yes.

Q Generally, what did this study look at?

A So this study -- this was a really good study. It was -- they looked at a manured field up in Whatcom County for four and a half years, and they looked at not only the inputs and outputs of nitrogen to this field so their accounting for how much manure was applied, how much -- I don't know if they considered if there was a commercial fertilizer, but they considered all the inputs going onto that field.

And then they looked at the output, so they were measuring the crop -- the crop and telling how much nitrogen was actually removed when they harvested the crop.

They also were looking at soil nitrate values, and they look at that year-round, and I believe it was weekly during the fall, and they looked at groundwater monitoring.

So this is really a comprehensive look at a manured land application facility.

Q Could you turn to Page 25 of the exhibit. I believe it's on Page 23 of the executive summary, so XX, three little I's.

A Got it.
Q Do you recognize this illustration?
A I do.
Q Can you tell us what this says and is illustrating.
A So this is a graph with all the soil nitrate that they collected over this four-and-a-half-year period.

And the green zones are the fall soil nitrate concentrations. And the red line is the target that they were shooting for, which would be 15 parts per million of nitrate in the soil.

There's a couple of things that jump out to me when I look at this graph, and one is, there's an awful lot of variability in soil nitrate, not only throughout the year, but also in that fall time frame when they might be taking that report card sampling or that fall soil nitrate.

The other thing that jumps out at me, too, is that the spring -- if you tried to look at -- the dates are a little bit hard to see, but if you look at anywhere between the December and the March -- or the April values, well, first of all, you can just look and see that never at any time were there any spring soil nitrate samples that were zero. There was always some soil -- there was always some nitrate present in the soils.

But there wasn't consistency in that springtime when

you look there either. So it wasn't a clearcut, the spring always shows us a certain amount.

Q So what does that tell you about planning a nitrogen budget for the coming year?

A I think it just reinforces how important that spring summer soil is because, if you're doing a nutrient budget and you really want to know how much nitrogen does my crop need, having your starting point is really important.

And there's a lot of variability that goes into what is the spring soil nitrate because there's something that happens over the wintertime -- well, it happens year-round, but it's called mineralization.

And it's when you take organic nitrogen and it slowly converts to ammonia, and that process -- we don't really have a good sense of what that mineralization rate will be from year to year.

And even when you go to some of -- some of the documents like they're in the literature review, like Barry 2000, he talks about that the mineralization rate is unpredictable, and it might be anywhere from 40 to 70 percent of what you saw that was in the soil in the fall.

So not having a definitive we know what the number is going to be in the spring based on the fall really highlights the importance of knowing what's in the soil

before you start applying more nutrients.

Q Okay. Thank you.

So you also mentioned timing as another aspect application? What needs to be considered when an operator is --

MS. BARNEY: Well, before we leave this, Ecology would move to enter Exhibit R-15.

MR. TEBBUTT: No objection.

JUDGE FRANCKS: R-15 is admitted.

(Exhibit No. R-15 admitted.)

Q (By Ms. Barney) What types of things need to be considered when an operator is planning the timing of manure applications?

A So it really has to do with providing nutrients when the crop needs it, and there's a figure. It's on Page 49 of the manure literature review. Oh, that would be R-4.

Q So I believe we're on 51 of the PDF, the figure at the bottom there.

A So this is a very simplistic illustration, but I think it's important because it shows the growth phase of a crop and the cumulative nitrogen uptake by that crop.

So you see in the very beginning, the slope of that line is very kind of flat, and that's when the crop is just starting to grow. And then you see the line steepens quite a bit, and that's rapid nitrogen uptake by

the crop.

So that's where you really want to be applying nutrients because that's when the crop will take them up. And then once the crop has matured to a certain point, it's going to slow that nitrogen uptake.

So really timing the applications so they coincide with a plant's growth needs is really important.

And I've done some work on looking at year-round land application for these food processors, and one of the things I've noticed -- I mean, one, there's a lot of similarities with a land treatment system, whether it's food processing waste or manure, but the year-round land application, we saw an awful lot of groundwater contamination.

And so that does -- when I start to think about these situations, it really highlights to me that the timing is a very critical piece to protect groundwater quality.

Q So in putting together the literature review, did you look at any tools to assist a producer with proper timing for their application?

A I did. That was one of the issues water quality asked me to look at.

Q And what tools did you look at?

A There were three -- well, I actually looked at four. One

of them was T-sum 200, which John talked about, and that's present in the permit.

Q So are these in the literature review?

A Yes, they are. I'll bet that's in the same section.

Q Okay. Perhaps even the next page.

A So there were three tools that I found that I identified that could possibly use to look at timing. One was the Washington irrigation guide, and that deals more with irrigation requirements of a crop rather than nutrient, but it gets at when a crop is growing; the wetlands climate guide, similar kind of tool; T-sum 200, which is described on Page 55 of the literature review.

And then I also expressed some of the issues applied with the application risk management also known as ARM.

Q And can you tell us a little bit about ARM?

A So applied risk management is a program that is proposed out of the Whatcom County conservation district. They're looking at finding windows of when it is okay to apply manure during the nongrowing season. And they've looked at essentially climate, when is it okay to apply.

When I've seen the proposal, one of the things that I noticed was that their low risk times for surface water runoff were high risk times for groundwater leaching, and when it was low risk for groundwater, it was high risk for surface water.

So that gave me some concerns, and Ecology had asked EPA, who was giving Whatcom County conservation district some money to study this, hired the U.S. geological survey to conduct a groundwater study up in Whatcom County.

And as it stands right now, the Whatcom CD produced a report that on the front page cover says, "This document has not been peer reviewed."

The USGS study saying whether or not water quality was impacted by this practice, they have not released those results yet, so, as yet, this is unproven technology from my perspective.

Q So in terms of, as you mentioned, T-sum 200, Mr. Jennings spoke about that yesterday and a little bit today was incorporated into the permit, what are the aspects of T-sum 200 as they relate to guiding a producer for purposes of determining timing?

A It really looks at temperature units, and so it applies regardless of where you're at. So it looks at -- from January 1st, you take the average of the maximum temperature and the average -- or the maximum temperature and the minimum temperature, and it averages those and that becomes your number.

And every day after January 1, it's a cumulative count. And once you reach 200, the tool says you're good

to go and you can start -- you can start. The crops are growing, so you can apply manure. That's the theory behind it, and it seems to be widely accepted.

Q Did you look at any studies that reviewed T-sum 200?

A Off the top of my head, I don't know that I did.

Q Okay. Thank you.

So the spring soil sample, again, its purpose is what?

A It's to document what's present in the soils, and its purpose is to help guide the nutrient budget so all subsequent manure applications or nitrogen applications are based on crop needs.

Q Okay. Now, what does fall soil sampling accomplish?

A Fall soil nitrate is essentially a look backwards. It's, how did we do? And John used the term "report card," and that's actually fairly commonly used.

It's essentially, how did we do? And if -- you know, we did all these different practices and then it's a report card on how you did.

Q Could you look at Exhibit R-12, please.

A Got it.

Q We actually discussed this a little earlier today.

Do you recognize this paper?

A I do.

Q And did you review this as part of your review for the

literature review?
A I did.
Q And what -- what did you find in this paper with regard to fall soil sampling dates?
A So Sullivan and Cogger, this is actually a really comprehensive useful tool. And one of the things that they recommend on Page 2 is, they use the October 1st date there.

And it says, "Because the timing of fall rainfall is unpredictable, the best strategy is to sample fields before October 1st whenever possible."
Q And did you conduct -- did you also look at other aspects of fall soil nitrate and draw some conclusions with regards to those?
A I'm not sure I know what you mean.
Q Well, was that part of your -- was part of your assignment to look at residual levels of nitrate in the soil?
A That was actually my first task, was to look at fall soil nitrate and what exactly does that mean.

And there was -- back in about 2011, 2012, people were using fall soil nitrate as almost like a compliance tool, but we really didn't know what that number meant.

And so one of the first things that water quality asked me to do was, Can you give us a handle on exactly

what does this number mean and what is protective of groundwater?

And so I looked at -- in the literature what was I seeing from recommendations, from researchers, from some of these soil scientists and agronomists like Sullivan and Cogger, what were their recommendations?

And I actually came up with a table that's in the literature review -- and I believe it's been projected earlier -- that compiles these recommendations.

Q Would that be the table that's on Page 41 of the literature review, or 43 of the PDF?

A Page 41.

Q Okay. In your compilation here, what did you determine with regard to these threshold levels?

A So when I looked at these, what was presented in the literature, that sort of gave me a starting place because, like Sullivan and Cogger, when we were looking at them, they would have specific recommendations that applied to, this is for Eastern Oregon and Eastern Washington, and it relates to either grass or corn.

So I just sort of compiled all of them. I'd never found any one number that was across the board, This is the number that you should meet.

The other thing that I noticed when I looked at these researchers that gave these recommendations was

that it didn't -- I couldn't tell from their publications whether these numbers were based on specific groundwater quality or surface water quality studies.

It sounded to me like it was a compilation of their experience, that they were making these recommendations.

So one of the pieces was, Okay, we've got this information, but now how does that translate into what we might expect to see in groundwater?

And so part of what I did for water quality then was, assuming that if we need to take these numbers and determine -- like, put them into a model and project what we might see in groundwater, what would those kind of numbers be?

And so I did that, and that's in the literature review also. Trying to come up with ballpark, Is 15 okay? Is 45 okay? Is 100 okay?

We didn't have a clue, and this was sort of trying to get at what soil nitrate values were acceptable and what did we think would -- might happen.

Part of the problem also was, we didn't have a lot of studies that I saw that were incredibly comprehensive like the Kerry Harrison report that looked at four and a half years on one field, looking at the soil nitrate and groundwater.

So that -- trying to put all that together, we

started to see like we think this might be something that actually works. And this is -- we both started to break them out into these field risk levels.

Q So can you tell us a little bit more about your selection process for the risk levels.

A So like Don said, the Washington State Department of Agricultural already were using these numbers and sort of these different categories. And then when we look at what we saw in the literature, they started to sort of fall into place also.

Now, the problem is, again, is coming down with these soil nitrate values, are they hard-and-fast numbers? We don't really feel like we have the evidence to say that, if you're meeting this number in the soil, what exactly that means.

We're still sort of trying to get a handle on that. I think we've come a long way, looking at the literature to determine what is a good soil nitrate value and maybe what isn't so good, but that's sort of the basis for developing this.

Q And did you also look at and have input into the adapted management actions that are called for in this table?

A Yes, I did.

Q Can you tell us about your work on that.

A So initially a lot of the adaptive management practices

were already in the final draft report that Jonathan had developed, and this was just sort of repackaged into a table.

But then we went and looked at some of what, like, Sullivan and Cogger 2003, this post harvest soil nitrate -- okay. I'll give you -- I know I'm jumping around, and I apologize.

R-12, they actually use, like, an adaptive management matrix in that document. So Page 7 or Table 3 of document R-12 is essentially an adaptive management matrix with -- when you have this soil nitrate value, these are the actions that we recommend you take.

Q And did you look at other literature in addition to Sullivan and Cogger?

A Yes, we did.

Q Okay. So are some of the other actions that you found incorporated into the matrix?

A Yes. Yes. We tried to make it as comprehensive as possible. We also tried to address -- we tried to allow for some flexibility in this table because one of the things that -- with the land treatment system is, if you have a really bad year, whether it's climate or pests come in and eat your crop, you can have -- your crop dies and all the nitrogen that you applied is left on the field.

So then that's still in the soils, but that's not necessarily the permittee's fault. So allowing them, Okay, you've had a bad year. How do you get back up into a more acceptable range?

That's why we thought that having that three consecutive year, the trend column, would give them the flexibility to work on improving their soil nitrate levels without having one of those catastrophes that you can't control.

And that's part of the problem with the land treatment system is, it's not like a wastewater treatment plant, like ^ Mullot, where you have full control over all the treatment of a treatment plant.

You're relying on climatic conditions, the soil, the crop, in order to do your treatment. So there's a lot of uncontrollable variables.

Q So just to look at some of the -- the figures in the table, say taking the high risk category, for example, the 31 to 45 parts per million of nitrate, is that -- if you have a field that is within that range, does that indicate nitrate is going to reach groundwater or it's available to reach groundwater?

A No. It does not mean it's going to reach groundwater. And typically when we're asking them to do the soil nitrate samples, typically the idea is, it's in the one

foot or the two foot. We're having them take it in the fall.

So especially in Eastern Washington, that soil nitrate may still be there the following spring, and so that may still be available for the next year's crop.

So we don't know exactly what's going to happen to that fall -- the nitrate that we're seeing in the fall soil sample. It may still be there and it may not.

Q In Western Washington where it's wetter, will all of that be leached out through rainfall?

A So it's tough to know. I've heard people say that the spring soil sample, it's essentially zero because it all leaches out. The Kerry Harrison report with the nitrate graph that was up there earlier demonstrates that it's never at zero.

It may be reduced and some may have leached, but some of it is still there, and whether that is from the fall or whether that's been mineralized from organic nitrogen that was applied the previous year, we don't quite know.

Q Is -- so I guess that's why it's called a risk level because there's a risk it could leach or it could remain?

A Correct.

Q Okay.

A And we stated in the permit that we really want fields to

be in the low or the medium category.

Q Do you support this adaptive management matrix?

A I do. I think it is a really good tool because what we're trying to do is keep the nitrate in the soil in the root zone. We want to make it available to the crops.

And I think the management practices give the permittee an opportunity to be every year annually refining their management practices so they can be improving and really reducing their soil nitrate levels.

Q Thank you.

I'd like to talk about groundwater monitoring for a while. Can we turn back to R-5, your implementation guidance where we had the diagram of the cats.

A Oh, wait. I'm having a binder malfunction here. Yeah. I see the diagram.

Q Okay. So under your -- the guidance that you wrote for implementation of the groundwater standards, is groundwater monitoring required for the CAFO permits?

A So there's two places where groundwater monitoring occurs, and it's -- with the lagoon assessment, if there is less than two feet of minimum vertical separation from the outside of the bottom of the liner to water table, then groundwater monitoring is required, and then in the adaptive management matrix, it is an option.

And the option is either stop manure application or

demonstrate that you're not impacting groundwater, by installing groundwater monitoring wells.

Q So the implementation guidance that you wrote under that implementation guidance for applying the groundwater standards --

A Mm-hm.

Q -- is groundwater monitoring required for the CAFO general permits under your guidance or under Ecology's guidance?

A So this document deals with applicability. Let me find it. So the groundwater standards apply to any activity that has potential to impact groundwater quality.

And what this guidance document talks about is, there's lots of different vehicles to implement the groundwater standards. It can be done through an individual permit. It can be done through a general permit. It can be done through an administrative order.

And -- okay. So Page 3, it talks about implementation.

Okay. On Page 4, there is a section called General Permits, 1.3.1.3. And it talks about, "A general permit is developed by the water quality program within Ecology for activities which are numerous, similar in nature, and have the potential to impact water quality.

"The hydrogeologic study and monitoring plan are

waived for any activity which is regulated by a general permit which includes groundwater protection provisions."

Q And do you consider the CAFO permits to contain groundwater protection provisions?

A Absolutely.

Q So to be consistent with Ecology's guidance, is groundwater monitoring required for the CAFO permits?

A No, it is not.

Q And how do the groundwater standards work? What are the -- what components go into their implementation?

A So the groundwater standards have three basic mechanisms to protect groundwater quality. They have the criterion which --

Q Which are what?

A Which are -- they're, in essence, the threshold that we never want to see groundwater go above. So for, like, nitrate, that would be the drinking water standard, which is 10 milligrams per liter.

So that's the criterion for nitrate in the groundwater standards.

We also have AKART, which is all known available and reasonable methods of prevention, control, and treatment. And I think with land treatment systems, prevention and control are the keywords there.

And then the third component is antidegradation.

And do you want me to explain a little bit about antidegradation?

Q Please.

A It's a little bit of a hard concept to explain because I can't tell -- it's very site specific. And I know, when I first developed the guidance, I have people call me on the phone and say, "Well, just tell me what is the number I have to meet."

I'm like, "It depends. It depends on all the site-specific conditions at your facility."

The idea is that, on one end of the spectrum, you have background water quality, the quality that's flowing in groundwater onto your property boundary.

And then you have the criteria for -- and so for nitrate that would be 10. And so the idea behind antidegradation is, you have to protect somewhere in that zone, but we can't tell you exactly because "exactly" depends upon AKART, and so AKART involves looking at all the different treatment technologies.

So we want to keep it as close to background as we possibly can, and we don't want to go above the criterion.

So that's -- it's -- antidegradation is an important concept, but it's really hard to articulate, and it's really hard to implement in -- unless you're doing --

looking at site-specific conditions at a facility.

MS. BARNEY: At this time Ecology would move to enter Exhibit R-5, the implementation guidance.

JUDGE FRANCKS: I think you already did. No. You're right.

MS. BARNEY: I'm not sure we did.

JUDGE FRANCKS: R-5 is admitted.

(Exhibit No. R-5 admitted.)

MS. BARNEY: Thank you.

Q (By Ms. Barney) Ms. Redding, could you look at Exhibit R-17.

A Got it.

Q Do you recognize this document?

A Yes.

Q Can you tell us what it is, please.

A This is a 2004 Ecology document. It's called "Guidance on Land Treatment of Nutrients in Wastewater with Emphasis on Nitrogen."

Q And what is the purpose of this document?

A This document is essentially AKART for land treatment facilities. And in the top paragraph, it specifically says, "Currently Ecology approves as AKART the design and operation and maintenance for land treatment systems that includes, one, the application of wastewater and its

nutrients at rates times the duration that do not exceed the crop's ergonomic rates."

Q So I'm going to stop you right there. That is what we were talking about before with the land application rates?

A Correct.

Q And do you -- is it your opinion that the land provision provisions of the permit meet No. 1?

A Yes, they do.

Q Okay. Thank you.

A I do want to clarify too, that in the permit we never use the word "agronomic rate." And the reason for that is, there's a lot of definitions of agronomic rate out there, and in the implementation guidance, when we're trying to protect groundwater, we talk about maintaining a viable crop with minimal leaching to groundwater and that's vastly different than an agronomic rate that's trying to maximize crop yields.

So we are careful in this permit not to use the term "agronomic rates." We're talking about application rates.

Q Okay. Thank you.

So could you continue where you were in that paragraph.

A Yes. "No. 2, the storage of wastewater and properly

lined lagoons that is produced in excess of the crop's requirements or outside of the growing season."

Q And what is a properly lined lagoon?

A Well, this is something that for the CAFO general permit that we defined as a lagoon that has a liner with a permeability of ten to the minus six centimeters per second without consideration of manure sealing.

Q Okay. I'm going to dig into that a little bit because we've talked some about permeability.

I think you are the person to tell us, what is permeability?

A So permeability is the ability of or the capacity of a media to transmit water. So, for instance, when you notice, like, a -- when you're at the beach and you notice that the water comes in on a wave and it immediately goes into the sand, that's a very permeable type of material.

But I'm sure you've also seen where you've got a lot of mud, the permeability of -- is -- and you get water and it sort of sits on top, that's a much lower permeability, and the -- it doesn't have the ability to transmit water as well as, say, coarse materials.

So Ecology has taken the permeability requirement to control how a lagoon is constructed and what we view as AKART.

And do you want me to talk about the ten to the minus six and how we developed that?

Q Yes. Please.

A So back in 1993, I was asked to look at -- again, we've got lagoons and we have different permeabilities, and what exactly does that mean to groundwater quality?

So I used an analytical model back in 1993. It was called "Random Walk," and I looked at a variety of different scenarios looking at permeability and loading to see what would be the projected impacts to groundwater quality.

Q Before you go any further, what units are you talking about when you talk about ten to the minus six? Ten to the minus six what?

A That's an important point. Centimeters per second.

Q Okay.

A I'm sorry if I'm not using that fully. Yeah. The detail about centimeters per second is important.

So I did this modeling exercise, and the results validated what we were sort of seeing in the literature and other recommendations that ten to the minus seven centimeters per second was protective of groundwater.

So we used that information as we have moved forward with looking at lagoons and what their potential impacts to groundwater might be.

Q So two different figures. One is ten to the minus six. One is ten to the minus seven.

What's the difference then?

A So the difference -- how we reduce that permeability -- and reducing means we're going from ten to the minus six to ten to the minus seven -- is, there's something that happens with manure.

It actually helps seal that liner. There's enough of the fines in the manure and there's both biological and physical and some even say chemical processes to act to form that seal.

It's well documented in the literature, although some people talk about, well, exactly how effective it is, but that has been well documented, this manure seal that you get.

MS. BARNEY: Okay. Thank you. Ecology would move for the entry of Exhibit R-17.

JUDGE FRANCKS: R-17 is admitted.

(Exhibit No. R-17 admitted.)

Q (By Ms. Barney) Can I ask you to turn to R-6, please.

A Got it.

Q Do you recognize this document?

A I do.

Q Can you tell us what it is?

A This is Appendix 10D of the NRCS, Natural Resource

Conservation Service. Their agricultural waste management system component design, and this is Appendix 10D, and it's called "Design and Construction Guidelines for Waste Impoundments Lined with Clay or Amendment-Treated Soil."

Q And was this a reference you used with regard to your work on the CAFO permits?

A Yes, it was.

Q And what is your understanding of the recommendations here with regard to permeability?

A So the recommendations that I read in this document are in line with what we have proposed in the CAFO general permit.

Q Let's see. If we can look at Page 2 of the document -- of the text, I should say. It's Page 4 of the PDF. I'd like to look at the bottom of the first column, the last two lines beginning with the word "However."

"However, the NRCS no longer recommends basing design decisions on the assumption that a full order -- full one order of magnitude reduction will be achieved with regard to" -- the section relates I think to regard to manure sealing?

Do you see that?

A I do.

Q Does this reduced reliance on a full order of magnitude

change your conclusions with regard to the productivity of the ten to the minus six standard?

A No, it does not.

Q And why not?

A So this document is dated 2009, and if you look at the 2008 document before it was revised, they have a recommendation of using a liner permeability of ten to the minus six centimeters per second with one order of magnitude reduction for manure sealing.

So that would essentially equate to one times ten to the minus seven centimeters per second permeability.

So when I looked at those two documents and I look at the references they use in these documents, they still reference the same nineteen -- I believe it's 1987 research that documents that manure sealing occurs.

They do not include any new research in the 2009 revision. What they cite is that they had seen some problems on a national level.

And when they describe those problems, those are under coarser grain soils, which, if you look at the NRCS specs about what soils are suitable for lagoons, you wouldn't use coarse soils for a soil liner.

Q And why not?

A Because they're -- it's -- again, we'll go back to like you're at the beach and you've got the sand. You can't

compact that sand in a way that it would actually make an effective liner.

So the NRCS has very specific guidelines about what types of soils are good for liners and which ones are not, and we've actually taken those tables and included them in the manure and groundwater literature review as these are guidelines for when you're constructing a lagoon. These, we think, are valuable tools.

So we would not see the coarse grain soils used as a type of liner.

Q So what does groundwater monitoring tell us if we have samples at a facility of the groundwater? What can that tell us?

A Well, so groundwater monitoring can tell you what the concentrations of certain constituents are when you take that sample.

It won't tell you necessarily -- depending upon what constituents, generally will not tell you when those constituents, what time, when they were released, how many years ago, and it won't tell you where those sources of those came from generally, especially if you're only looking for nitrate.

Q If you were to -- if there was a facility where you wanted to conduct groundwater monitoring at that particular facility, would you be able to sink one well

and monitor that and derive data that told you about the condition of that particular facility?

A No. Generally, for looking at groundwater, you need to understand what's upgradient and what's downgradient, and so for that, you need at least three wells.

On a facility like when I've looked at these big potato processors, they had sometimes up to like 40 wells on their -- on their property because they had -- they had lots and lots of acres, and they were land applying.

So I think I got myself off track.

Q No. Actually, I think you're right -- on the right track.

A What was your question?

Q Well, what's -- was one well enough, and I think --

A No. Okay. No.

Q So if -- even in a system where you have -- you suggested a minimum of three wells, if you were to take samples or say you have four, two upgradient and two downgradient, would that tell you necessarily if a facility in between those two sets of wells was causing a groundwater problem?

MR. TEBBUTT: Objection. Leading.

A So there's a couple of --

JUDGE FRANCKS: I'm going to overrule that.

THE WITNESS: Oh, I'm sorry.

JUDGE FRANCKS: I'm going to let her answer.

THE WITNESS: I was used to the deposition where -- okay.

MR. TEBBUTT: Just ignored the lawyers there; right?

A I will not comment. So you've got me off track.

So groundwater monitoring -- so if we're looking at nitrate -- and that's the primary contaminant of concern that we're talking about here. I mean, there's other contaminants also.

If we're looking at nitrate, nitrate is the most prevalent contaminant that we find in groundwater. It comes from so many different sources.

Anytime you have animal including human waste, you're going to find high levels of nitrogen in that waste. It also comes from commercial fertilizer, and it can actually be naturally occurring.

So identifying where nitrate came from when you're looking at groundwater quality concentrations from a well is really challenging to do. So that's one problem.

The other problem is this lag time that I talked about before. So between when you do something at the land surface, by the time it actually makes it to

groundwater and then moves laterally to your groundwater well may be a long time.

So when I'm sampling today for this -- from this groundwater well, I'm not necessarily knowing that that happened the previous season. That may have happened years ago.

And, again, that's based on site-specific conditions about what that travel time is from the contaminant at the land surface to when we see it in groundwater.

So if a facility came in and, you know, had management practices that left a lot of soil nitrate but then they improved, taking a groundwater sample might be reflective of when they had less good management practices, and then if they improved their management practices, that might not be reflected in the groundwater monitoring that we see.

So as we're looking at groundwater monitoring, trying to be very thoughtful about what information is that going to tell us and how does that help the seasonal going back and making improvements to the land treatment system each and every year.

Q Can you tell us what some of the factors are that contribute to that time lag?

A Well, it's site specific, so --

Q But take -- if you were to look at a site, what are the

types of aspects of that site that would be important for you to analyze what might be causing a time lag?

A So the soils -- depending on how permeable those soils are will really dictate how freely the water moves through there. And another big thing, too, is precipitation or irrigation.

So with nitrate, water is really the driver that's going to move that nitrate from the root zone down to groundwater.

So if you've got -- if you're in an area where there's a lot of precipitation or where somebody is irrigating a lot, you can move that nitrate down through.

Q Okay. Thank you.

JUDGE FRANCKS: Ms. Barney, might this be a good time for a ten-minute break.

MS. BARNEY: This is a perfect time.

JUDGE FRANCKS: All right. Let's take a ten-minute break. Come back at 3:01.

(Recess taken from 2:51 p.m. to 3:02 p.m.)

JUDGE FRANCKS: Have a seat. Let's go back on the record.

Ms. Barney?

MS. BARNEY: Thank you, Judge Francks.

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DIRECT EXAMINATION (Continuing)

BY MS. BARNEY:

Q Ms. Redding, we can speak about storage lagoons for just a minute.

So if a storage lagoon is either constructed or as existing meets the ten to the minus six permeability standard, does Ecology consider that AKART?

A Yes.

Q Does -- when we think about that ten to the minus six, what does -- does that easily translate into -- strike that.

We've had some discussion about -- with Mr. Jennings about the two-foot separation between the bottom of a lagoon and the high water table or groundwater.

How does Ecology measure that two-foot separation? And we can look at one of the diagrams we had up earlier if that would be helpful.

A That would be good. The diagram from NRCS 716, I think, is a good diagram.

Q Okay. So that would be Exhibit R-7, and I believe it is Page 29 of the PDF.

A Appendix C, if I can -- oh, there it is.

Q We're just going to see if we can make it a little bit bigger there on the screen.

A Oh, that's helpful.

Q So when Ecology refers to the bottom of the lagoon, where is Ecology referring to?
A Ecology considers the little No. 2 to be the bottom of the lagoon, and in the permit it specifically says the bottom of the outside of the lagoon.
Q So does it matter what the lagoon is lined with where the measurement takes place?
A No, it doesn't. Because the minimum vertical separation -- the reason why Ecology has that in there is for pathogen treatment.

In animal waste or even human waste, you have bacteria and viruses that can remain viable in -- not only in the subsurface but in groundwater for long periods of time.

And having an unsaturated zone of two feet is really important for the attenuation, the treatment, to allow those pathogens to die before they reach groundwater.

So that's really pretty critical.

Q So if you had -- if this was a synthetically lined lagoon, you would be measuring from the bottom of the liner, the undersurface of the liner?
A Correct. It doesn't matter whether it's a clay lined lagoon or a synthetically lined lagoon. If manure is getting through and it has pathogens in it, you need the two feet of minimum vertical separation for -- to deal

with, to attenuate, to kill those pathogens.

Q And is it your understanding that NRCS disagrees with that --

A Yes. They disagree with that.

Q -- interpretation? Okay.

What if a lagoon had a two-foot liner?

A So the problem with the NRCS interpretation -- and I understand that they may have different reasons for having their designation where they do, but ours is from a water quality perspective and the pathogen treatment.

So say we were to use the 1, the sub 1 as our measurement point from a water quality perspective. If that liner was two feet thick, you would have no unsaturated zone conceivably, and you would have -- liners are often saturated because you've got all this water in the lagoon that's providing head or pressure, and it's making that liner saturated.

So you would have essentially no unsaturated zone for pathogen treatment.

Q Are you familiar with the document Tech Note 23?

A I am.

Q Can you tell us why it was used in the permit?

A So originally the final draft permit had a provision in there for a lagoon assessment. And the idea behind that was, Ecology doesn't have access to a lot of lagoon

specifications around the state because -- for a variety of reasons.

And so this lagoon assessment was essentially designed to prioritize the lagoons, get a handle on how they're constructed by having that be a permit requirement.

Q And is that -- do you feel that that's a protective aspect of the permit?

A The Tech Note 23 is more of an informational gathering component of the permit, trying to understand exactly how these lagoons are constructed.

And I think part of the problem is, we've heard a lot of the different anecdotal information about lagoon construction, and so it's hard for us to know exactly what is the state of lagoons in Washington State. So this is kind of an attempt for us to get a better handle on that.

Q Okay. We heard a little bit from Mr. Jennings yesterday about the pen and corral areas of CAFOs.

Are you familiar with aspects of pens and corrals where the animals are confined?

A Yes.

Q So what can you tell me about those areas with regard to risks for groundwater?

A So that was one of the things that I was asked to look at

in the literature review, and unfortunately there's not a lot of information on pens and corrals.

And I think, as I was reading what limited research there was on it, I began to understand why. So a pen area is where they keep the animals.

And the manure that's dropped there gets compacted, and it actually forms this thick black organic layer that one researcher actually stated that the permeability was one times ten to the minus ninth.

So with the manure and the compaction, it really creates this organic barrier. And so when researchers were looking at soil samples, they found that in the top uppermost part of the soil, they found elevated soil nitrate, but then it quickly dropped off to background concentrations.

And so one of the researcher's theory was that initially, as this thick organic layer is getting developed, that you would have some infiltration of the soil, the nitrate that was moving into the soil.

But then once you have that -- essentially ten to the minus ninth is pretty impermeable, and you don't have the hydraulic head in a pen/corral area like you do in a lagoon.

The hydraulic head is the liquid, and that provides this pressure that drives the liquid through that liner

lagoon -- the liner of the lagoon.

But in a corral area, you don't have nine feet of liquid manure driving water through that possibly ten to the minus ninth centimeters per second black organic layer.

So the literature I saw wasn't suggesting that this was a significant source of nitrate from dairies.

Q Do you consider that a risk area at a CAFO?

A I consider it to be a potential source of contaminants.

Q Would it be greater or less than the land application area?

A If I had to rate them, I would say land application area provides the greatest risk. There's the highest amount of loading there. Next would be the lagoon.

And then I know people have talked about some other areas, but I think those are less of an issue because you don't have hydraulic head, and you don't have the loading to the land surface like you do with the lagoons or land application.

Q An additional area we talked about yesterday was a composting area.

Did you find literature addressing that?

A I was not asked to address compost, so I did not look at that.

Q Okay. Thank you.

Do you consider this permit to be protective of water quality for surface water and groundwater?

A I do.

MS. BARNEY: Subject to reserving the right to recall Ms. Redding as necessary on rebuttal -- whoops. I need to move to enter an exhibit, please. Exhibit R-6.

JUDGE FRANCKS: R-6 is admitted.

(Exhibit No. R-6 admitted.)

MS. BARNEY: Thank you. But, again, just subject to reserving the right to recall Ms. Redding as necessary for redirect and for rebuttal, that's all I have.

JUDGE FRANCKS: Okay.

MR. TEBBUTT: Just take a second to reorganize.

CROSS-EXAMINATION

BY MR. TEBBUTT:

Q Ms. Redding, good afternoon. I'm Charlie Tebbutt. We've met a number of times, haven't we?

A Yes, we have. Good afternoon.

Q Good afternoon.

I'm just going to kind of go through some of the issues that Ms. Barney raised and just talk to you about some of those before we revisit AKART.

A Okay.
Q But there were a number of questions that Ms. Barney asked that I think need some revisit. Let's start off with where she started, the water quality program.
You said you were asked to do a literature review by the water quality program?
A Correct.
Q You said "they." Who are "they"? Who are those people in the water quality program that asked you to do that?
A The specific names?
Q Sure.
A So Ron Cummings was the first person that initiated this. Ron talked to me about doing a literature review to help develop the science behind developing a general permit.
So the processes -- he puts together a form that says what he wants done. It gets submitted to my program, but it has to go through the water quality program management team to be evaluated in terms of, is it a priority and then --
Q Let me stop you there. I'm asking who was on the program, not the whole history of what you did, but who were the people that asked you to do that.
Ron Cummings was one. Who else?
A So what I'm trying to explain is, Ron developed the additional request, and then it has to go get approved by

the water quality program management team.
Q Okay. Who is that?
A So that would include the program manager and --
Q And who is that? I want a name. We don't want just the bureaucrats. We want the names of the people that are making decisions here.
A Okay. It's a little tough for me to know exactly who was on the program management team back in 2011-2012. I would have to go back and look at an organizational chart to tell you specifically and accurately who those people were.
Q Does it change that often? The organizational chart changes pretty often?
A If I'm giving you an answer, I want to be accurate.
Q That's not my question. Does the organizational chart change very often?
A I think with any position, sometimes people leave and new people hired.
Q Okay. You don't remember who Ron Cummings' boss was at that time?
A No, I don't.
Q Okay. Why didn't you include the Yakima Valley cluster litigation information as part of your literature review?
A So Ecology is required by the legislature to use credible data to make policy decisions. And so when I developed

the literature review, I have a section in there that talked about -- previously about methodology, about what data could be used and what couldn't.

And so the data that -- if data comes to me in a peer review journal or has -- somebody can show that they have a report where they had a quality assurance project plan that looked at the data and determined that that -- those data are accurate and then reviewed the data and analyzed it and drew conclusions, that was something that I included in the literature review.

Q Okay.

A But data that's collected without that, again, falls into it's a work in progress. It's raw data or data that has not been collected with a quality assurance project plan.

Q Okay. Let's stop right there.

A Okay.

Q The -- you've reviewed some of the Cow Palace data; correct?

A Yes. I've read the Cow Palace expert report and decision.

Q Okay. And you read Mr. Erickson's report?

A I have.

Q Correct? And did you read Dr. Shaw's report as well?

A I don't --

Q The soil scientist.

A I don't recall.
Q Okay. Did you read Mr. Erickson's report?
A Yes.
Q Have you also reviewed the annual reports submitted by the dairy's consultants?
A From Cow Palace?
Q From the Cow Palace cases that have been going on for years.
A No, I have not.
Q Why not?
A I --

MS. HOWARD: Your Honor, I'm just going to object. I don't think this is a relevant line of questioning at this point.

MR. TEBBUTT: Couldn't be more relevant, Your Honor. This is the real life. This isn't the theory of sitting in an office, writing a permit. This is what's happening in the field. And if she doesn't know about this data -- I'm just inquiring about why she didn't, why she hasn't included that.

JUDGE FRANCKS: What issue does it relate to.

MR. TEBBUTT: It relates to groundwater monitoring. It relates to field application. It relates to all the different sources that contribute

to groundwater contamination.

JUDGE FRANCKS: Okay. I'm not familiar with the Cow Palace litigation, so --

MR. TEBBUTT: I'll lay a little more foundation.

JUDGE FRANCKS: Yeah. Lay a little more foundation.

Q (By Mr. Tebbutt) Are you aware that as part of the Cow Palace litigation and consent decrees, that annual reports are required to be done by the dairies and sent to EPA?

A Yes. I am aware of that.

Q And are you familiar that those reports include quality assurance/quality control measures built into those?

A I wasn't aware of that.

Q So you haven't looked at the information carefully enough to determine that there is QA/QC in there; correct?

MS. HOWARD: Objection, Your Honor. Misstates testimony.

JUDGE FRANCKS: I'm going to sustain that objection.

MR. TEBBUTT: It's a simple question, Your Honor, that was just trying to elicit whether she looked at it or not.

JUDGE FRANCKS: But you characterized

her testimony, so --

Q (By Mr. Tebbutt) Did you look to determine whether quality assurance/quality control was done in that particular -- in the Cow Palace and -- well, in the Cow Palace litigation cases?

A I did not look at the data, so I don't know if there was quality assurance done for it or not.

Q You state you didn't look at the data. Which data? Are you referring to the annual reports?

A So I stated that I looked at Mr. Erickson's expert witness report, and I looked at the court decision, and so I've looked at that.

Q Okay. Are you aware that some 32 monitoring wells have been installed around the Cow Palace, Bosma, and DeRuyter facilities as part of EPA's administrative order on consent and the CARE consent decrees?

A I knew that monitoring wells went in. I did not know the number was 32.

Q Have you looked at any of the data that has shown what's come out of those monitoring wells?

A No, I have not.

Q Why not?

A Because I have a very full work plan.

Q And the data was started to be collected in 2013. That was while you were doing the manure literature review;

correct?

A Correct.

Q So why didn't you look at the 2013 and 2014, 2015, 2016 data as part of your literature review?

A I did not know that those reports were out there, and I specifically included Ralph Fisher with the EPA on my peer review.

And one of my specific questions to my external peer reviews -- and the other one was Charles Ellingson with Pacific Groundwater Group -- was: Is there any other literature that I have missed that I should be considering for this report?

And my guess is that one or both of them, if they were aware of that and thought it relevant, they would have brought that to my attention, but they did not.

Q But you were aware of the data, weren't you?

A No, I was not. I was aware that sampling was occurring, but I was not aware of those reports.

Q Weren't you told by the environmental appellants in meetings that the data was available?

A So when somebody says data is available, that's different than there's a report that has quality assurance and peer reviewed. That's different.

Q Okay. Well --

A So maybe --

Q Did you read any of the comments submitted by the environmental appellants in these cases?
A What specifically are you referring to?
Q Two particular exhibits. Let's pull one up. While we're looking for it, here's the first one, Exhibit No. A-8. Let's look at the cover page.
A A-8, is that in a binder?
Q It is, yeah. Right behind you.
Have you seen this document before, A-8?
A No, I have not.
Q So you didn't read the comments from the environmental appellants in this case?
A I have not seen this document.
Q Okay. How about A-69? Have you seen that before? Probably in the second binder.
A No. I have not seen this document.
Q Okay. So as part of your job as -- you were involved in the drafting of the final permit; correct?
A Correct.
Q Did you review any of the comments from any of the commenters?
A Yes, I did.
Q Which ones?
A So Ecology had a process for dealing with close to 4,500 comments, and we had a very short time frame to turn

those around.

So we didn't -- there were certain staff that took all the comments and grouped them not by, "This is from this commenter," but grouped them by topics.

And so when I was reviewing comments and responding to them, I didn't necessarily know who made the comment. I was looking at a group of comments, and we were responding to that.

So, for instance, if there was a group of comments on the timing, they would be all grouped together, and then we would work on responding to those comments.

Q Okay. Let me stop you. Did you work on the comments on hydrogeology and the movement of contaminants from surface to groundwater on the comments?

A Movements of --

Q Contaminants from surface to groundwater.

A Yes.

Q And so wouldn't those comments have involved a number of the comments made by the environmental appellants in those cases?

A I don't know what the -- okay. So let me try to clarify for you.

Q Well, let me help because I think I'm getting at it.

So you didn't -- you didn't know the source of the comment each time? Was it just categorized by issue --

A Correct.
Q -- rather than who sent it?
A Correct.
Q Okay. You were asked about Exhibit R-5, which was a document about land application that you authored originally in 1996; correct? Ms. Barney asked you about that?
A The Implementation Guidance for the Groundwater Quality Standards?
Q Yes.
A Yes. I authored that.
Q Okay. And that was revised -- you said just Appendix A --
A Correct.
Q -- to that was revised in 2005; correct?
A Correct.
Q So you talk about the nutrients and how they can move and be handled in land application, but what about the bacteria and other pathogens? Those aren't treated before they're applied to the land, are they?
A So because of the process of when they're land applied and then they are present in the soil for a significant amount of time, they're exposed to a much larger area of unsaturated zone, so they theoretically would be treated.
Q So the treatment then is just laying it out on the land?

A No. The treatment occurs in the unsaturated zone, or it can also -- if it's at the land surface, a lot of pathogens -- sunlight will kill them.
Q Okay. If the manure is laid on thick, though, it won't kill all the pathogens; right?
A You know, I don't know. I can't speak to that. I haven't looked at that personally.
Q Okay. So you're not a microbiologist then?
A No. Unfortunately.
Q Okay. But there are threats to -- of the bacteria and other pathogens running off to surface water if manure, for instance, is applied to surface lands; correct?
A I can't speak to that.
Q Why can't you?
A That wasn't an area that we -- so you're talking about runoff --
Q Correct.
A -- to surface water.
Q Right. Runoff to surface water. So you can't speak to that?
A No.
Q Is that out of your area of expertise?
A I would say so.
Q Okay. How about percolation of bacteria to groundwater? Can that occur under certain circumstances?

A Yes, it can.
Q Okay. And under what circumstances would there be a risk of bacteria or other pathogens moving to groundwater?
A So anywhere that you have -- you don't have that unsaturated zone, you run the risk of having pathogens because pathogens like cold, wet environments. So I think those would be the conditions.
Q So, for example, I think you testified earlier that lagoons can cause a mounding under them sometimes? You can -- saturation under a lagoon can cause the water table to rise and get closer to the bottom of the lagoon?
A I did not say that.
Q You didn't?
A No, I did not.
Q Okay. I apologize.
Are you familiar with the concept of mounding?
A Yes, I am.
Q Okay. Can you describe what that is under a lagoon? What's the concept of mounding under a lagoon?
A Why don't I talk about the concept of mounding, in and of itself, because actually -- actually, I haven't really looked at mounding under a lagoon.
Q Okay. Well, then, I think --
A I don't have direct experience with that.
Q Okay. Then we'll pass on that.

A Okay.
Q You talked about how water will move from the surface through the vadose zone. Let's take a look at R-5, Page 14.
A I don't think it's 14. Is it Page 2?
MS. BARNEY: It might be 14 of the PDF.
A I think it's Page 2 of the document.
Q (By Mr. Tebbutt) I think that's correct because that's the 14th page in the PDF version.
So you talk about the unsaturated zone being the vadose zone?
A Correct.
Q Is that a fair assessment?
A Correct.
Q Okay. And you talked about the water moving down until it hits groundwater; right?
A Correct.
Q It can hit some other less permeable soil and move laterally, couldn't it?
A Correct.
Q Because water will find the path of essentially least resistance; correct?
A Correct.
Q And gravity will drive it down to groundwater; correct?

A Correct.
Q And it will eventually reach groundwater? Any water that gets below the root zone will eventually reach groundwater; correct?
A No. I would not say that.
Q That would be a very unusual circumstance when that doesn't happen, wouldn't it?
A So, technically speaking, you can have water that's bound in the soils that's not moving, so that water is very hard to move, and that water may not make it to groundwater.

You can have water that -- that essentially is evaporated, comes out of the soils under dry conditions, and that would not make it to groundwater.

Q Right. But if you have continuously farmed land with irrigation and manure application, you'll have a continual source of water driving the water down, won't you?
A Well, it depends upon their irrigation and manure management practices, if that's continual.
Q Right. But any water that goes below the root zone is going to keep going down, isn't it, by forces of gravity?
A Correct.
Q Let's take a look at Page 21 of R-5, please. Actually, we'll return to that one.

Let's get into the issue of lagoons for a minute. And let's look at R-6, Appendix 10D, just for reference. And I believe you testified earlier that the question from Ms. Barney that a lagoon with the permeability of one times ten to the minus six constructed, one times ten to the minus six permeability, is, in your opinion, AKART; correct?

A That's not what I stated.

Q Okay. What did you state?

A My statement was, the permit says that for lagoons in the permit, it's -- the permeability is ten times -- one times ten to the minus six centimeters per second without consideration for manure sealing.

Q Okay. And that's the -- that's the AKART standard for an as-built facility; right? And then you add manure to make one times ten to the minus seven?

A No. That is not correct.

Q So what is the as-built for a lagoon? What's the permeability level that is acceptable under AKART?

A For new or refurbished lagoons, the AKART standard is one times ten to the minus six centimeters per second permeability without consideration of manure sealing.

Q Okay. So you believe then that there's another order of magnitude so-called sealing effect of the manure --

A Correct.

Q -- based on the literature?
A Correct.
Q You ever seen any empty lagoons in real life?
A No, I have not.
Q So you haven't seen the cracks in them apparently; is that correct?
A I haven't seen an empty lagoon.
Q In real life. Okay.
Have you seen pictures of the erosional features in lagoons?
A Yes, I have.
MS. NICHOLSON: Objection. That's assuming facts not in evidence.
JUDGE FRANCKS: What facts are we assuming.
MS. NICHOLSON: He's assuming there's erosions. He's assuming that there's cracking. We haven't established that.
JUDGE FRANCKS: Sustain that.
MR. TEBBUTT: She just said she's seen pictures of erosional features in lagoons.
What's wrong with asking the question about that?
JUDGE FRANCKS: Well, you asked it before she answered. So you can ask her about pictures, sure. She said she hadn't seen any.

Q (By Mr. Tebbutt) Have you seen pictures of erosional features in lagoons?
A Yes.
Q And wouldn't those erosional features reduce the permeability level of the lagoon in that particular eroded area?
A So I believe the erosional features that I saw were more in the side walls of the lagoon, and it was used as a demonstrative purposes about how to maintain a lagoon.
Q Okay. Did you make any calculations about how that would affect permeability of the side walls?
A No, I did not.
Q Okay. Have you ever seen any erosional features go down to the bottom of a lagoon, any pictures going down to the bottom?
A Not that I can recall.
Q Okay. You were asked about nitrate generally, and I think you made a statement that, among other things, you know, there are lots of sources of nitrate in the world; correct?
A Correct.
Q And one of them being natural sources?
A Correct.
Q Correct? Natural sources of nitrate are very low levels; right?

A Correct. In most circumstances.
Q Right. It would be in the single, like a one part per million-ish area; right?
A I'd say ballpark.
Q Right. So have you read the Cow Palace decision by Judge Rice?
A I already stated that, yes, I did.
Q And you read the part where the judge said that, even if a lagoon is built to NRCS standards and used a conservative estimate of one times ten to the minus seven, the Cow Palace lagoons themselves would discharge over three million gallons per year.

Do you recall that?

A I don't recall that. I mean, when I read the decision, it was a while ago.
Q Uh-huh.
A So I don't remember -- I remember that there was a statement similar to that.
Q Okay. Would it help if you saw that statement to refresh your recollection or would you accept my factual statement that there are three million gallons a year lost from the Cow Palace lagoons?

MS. HOWARD: Your Honor, we're going to object to this line of questioning. As we stated before, we have some concerns with bringing the Cow

Palace conversation in and how exactly it's relevant to the permit.

But on top of that, we don't have the facts in front of us of the Cow Palace case and the basis for Judge Rice's decision, so there's just some concern here with, again, relevance and also just foundation for this line of questioning.

MR. TEBBUTT: But we will have it in front of you when we have Mr. Erickson on the stand. We're calling this witness to try to get her on and off the stand once so we don't have to call her again.

And so, if you bear with me, we can get this done a lot faster. Otherwise, we're going to have to recall Ms. Redding.

MS. HOWARD: We don't -- if she can establish those facts in order to answer the questions, that's one thing. And Mr. Tebbutt can obviously do that through his own witness, but to continue to ask along this line of questions when clearly this witness doesn't have that information does, again, raise question of foundation under relevance at least at this time.

JUDGE FRANCKS: Okay. I am going to allow you to do a couple more questions, but you need to be honing in on something that she knows.

Q (By Mr. Tebbutt) Okay. Let's assume, for the purposes

of this question, Cow Palace lagoons discharge three million gallons a year based on a finding that they were built to NRCS specifications and the extra manure sealing was in place such that the lagoons performed at a permeability of one times ten to the minus seven centimeters per second. Okay?

A Okay.

Q All right. That was -- that would be -- all right. Let's just stop there.

If the permeability were an order of magnitude lower, one times ten to the minus six centimeters per second, that would mean the discharge would be about 30 million gallons a year, correct, or a magnitude greater?

A Correct.

Q Okay. And so that would mean that there would be approximately or even conservatively a hundred thousand gallons a day of manure water being leaked from the lagoons, correct, at 30 million gallons a year?

A I can't answer that because I don't know what the surface area of the lagoons are that we're talking about.

So if -- for instance, if we were to look at Appendix 10D, the NRCS document, and they talk about, here is a permeability of, say, ten to the minus six centimeters per second, they do it per unit area of

seepage, and they estimate, okay, under these conditions, ten to the minus seven, you would have 1,000 gallons per day per acre.

And then we could talk about, what does that mean in inches per day, or we could talk about it in terms of how many gallons per year per acre. But not knowing the size of the lagoon makes it impossible for me to tell you, is that value correct or not.

Q Okay. Great. I'm not asking whether it's correct or not. I'm just asking you to assume the hypothetical that it was proved that three million gallons was discharged from the lagoons per year, and that was using a one times ten to the minus seven centimeters per second permeability.

So if the order of -- if the permeability was an order of magnitude less, that would make the discharge 30 million gallons a year, wouldn't it?

MS. HOWARD: Objection, Your Honor. It's incomplete hypothetical. The witness has just testified she cannot answer this hypothetical because she doesn't have sufficient information.

JUDGE FRANCKS: I'm going to sustain that one.

Q (By Mr. Tebbutt) Can you not answer that question with that information?

MR. TEBBUTT: I think it's up to the witness to know whether she has enough information or not, not a lawyer in the back room.

MS. HOWARD: Objection, Your Honor. Same objection.

JUDGE FRANCKS: I sustained the objection. I think you got the answer that she could answer.

Q (By Mr. Tebbutt) The two-foot separation that you talked about between the bottom of the lagoon and groundwater -- correct?

A Correct.

Q Necessary standard in the ecology permit; is that correct?

A Correct.

Q That two-foot separation deals with pathogens, treatment of pathogens?

A Correct.

Q Doesn't deal with treatment of nitrates, does it?

A No, it does not.

Q Now, Ms. Redding, have you been part of the groundwater management area in the Lower Yakima Valley?

A Yes.

Q So you participated in some of those meetings?

A Yes, I have.

Q And gotten information about some of the problems over in the Yakima Valley?
A Yes. I'm aware of those.
Q Okay. And you agree that there is a serious contamination of the aquifer in the Lower Yakima Valley?
A Yes. That's why the GWMA was formed, to address the groundwater contamination problem.
Q And is Ecology's position that the majority of the contamination in the aquifer in the Lower Yakima Valley comes from the dairies?
A Can you restate that? What --
Q Yes. Is it Ecology's position, your -- well, your -- is it your understanding that a large majority -- or let's just say a majority of the pollution in the Lower Yakima Valley aquifer is coming from the dairies that are operating in the Lower Yakima Valley?
A Well, I don't know that information. I can't make that statement.
Q Have you reviewed the EPA study that was done from Lower Yakima Valley 2010 to 2012?
A Yes, I have.
Q Okay. And have you reviewed the conclusions in that study that the dairies are the most significant source of contamination in the Lower Yakima Valley?
A That is not the conclusion from that report. That

misstates that.
Q What do you believe the conclusion is of that report?
A The conclusion is, EPA looked at a variety of sources, and they said that dairies are contributing to nitrate contamination of the aquifer. They also identified other sources that are contributing to nitrate contamination of the aquifer.
Q Did in the EPA study say a majority of the contamination was coming from the dairies?
A No. The report did not state that.
Q Let's take a look at A-17.
A Is A your binder?
Q Yes.
A Okay. Okay.
Q Have you seen this document before?
A This is a document that was shown to me in my deposition.
Q Okay. So have you read it?
A I did during my deposition.
Q And is this a document that was produced as part of the groundwater management area?
A This is an email from Kirk Cook, who at the time worked for Department of Agricultural, to Vern Redifer, who is the public works director for Yakima County.
Q Okay. Have you inquired about the content of this document at all with anyone?

A So I am not on the distribution list of this document, but I did see this during my deposition.
Q Okay. And have you inquired with anyone as to the accuracy of the information that's contained in this document?
A So -- Kirk Cook was working on something called a nitrogen loading assessment for the Lower Yakima Valley, and we'd been using the term GWMA, but it's groundwater management area.

And I did a peer review, along with others, on his report, so I do know that while what Kirk has said with the numbers, what he states in here about the leaching of nitrogen to groundwater, that was not within his scope.

And so I don't know how he can make that statement because he did not look at groundwater to make that -- to do that assessment.
Q Okay. But you're familiar with the numbers in this report, and you've referred to them in other work that you've done?
A At the time -- and I think it might have been two years ago -- I did a peer review on this document.
Q Uh-huh.
A And when Kirk was involved, there was some serious issues, and since then, Kirk moved on, and Department of Agricultural has revised that document.

So I have not taken the time to go back and look at this email to verify because I know that the report that he generated before he left had a lot of issues in it.

Q Okay. Do you know whether it overestimated or underestimated the loadings of nitrogen from the four sources that are identified here?

A All I know is, there were severe problems with the report the first time I saw it, so I can't remember if it was over or under or just plain wrong.

Q Okay. Have you referred to any kind of later document that has more accurate numbers in it in any of your work?

A Well, the Department of Agricultural has been and Yakima County have been working on that document, and I'm not sure where it's at right now.

I've read a peer review, and that was, I don't know, maybe a year, 18 months ago. It's been a while since I've looked at this document. It's not finalized yet.

Q So animal pens, the potential of discharge from animal pens has not been covered at all in the -- to groundwater; that is, has not been covered at all in the permits that are at issue in this case, has it?

A I disagree with that statement.

Q Where has it been covered?

A So I believe John in his testimony pointed out the specific areas of the permit where it was covered.

Q Didn't that all deal with potential surface runoff?
A I'd have to go back and look at his testimony.
Q Compost, in any of the compost areas indicate -- well, let me ask you this. Ms. Barney asked you some questions about animal pens and whether they were a potential source of contamination.

Do you believe that they are a potential source of contamination?

A I believe they're low risk --
Q Okay.
A -- for the reasons that I stated previously.
Q And you said you did review Mr. Erickson's report in Cow Palace; correct?
A I did.
Q And did you look at the soil borings that were done in the animal pens in Mr. Erickson's report?
A I did.
Q And did you see Mr. Erickson's opinions about whether the animal pens were a contributing source of pollution to groundwater?
A I'm not disputing Mr. Erickson's observations or findings in his expert report, but I think that it -- when you're developing a general permit that applies to all CAFO statewide, that you can look at one CAFO and see that there might be some issues, but taking that one CAFO and

extrapolating it to all CAFOs statewide, that goes beyond the scope of a general permit.

That would be more suited to an individual permit, which Ecology has the authority to do, if there's a problem, is to take that CAFO, put them under an individual permit, and then write site-specific conditions for them, that facility.

Q Have you seen any other data on animal pens, actual data in the state of Washington on animal pen contribution to -- to below surface contamination other than the Cow Palace data?

A No, I have not.

Q Please get in front of you Exhibit A-11, Page 14.

A What is this document?

Q This is the draft permit.

A It's the preliminary draft?

Q Yes. And were you part of the preliminary draft?

A No. As I stated before, I was not.

Q Okay. So anything having to do in here, you were not involved with whatsoever?

A No.

Q Okay. Well, I guess we can move on then.

Let's take a look at R-4 of the manure literature review. Let's take a look at the soil application information.

A What page?
Q Pages 42 -- 41 through 45 we'll talk about.
A Okay.
Q Is there anywhere in the manure and groundwater literature review that says 45 parts per million of application is safe?
A Boy, off the top of my head, I don't know. It's not in this table.
Q Actually, before getting to this area, I think earlier you testified that compost is fairly dry; is that right?
A No, I didn't. I did not testify on compost except to say that I did not review any literature on that.
Q Okay. Do you remember being asked in your deposition whether compost is dry?
A No.
Q Have you ever tested the moisture content of manure composted at dairy?
A No, I have not.
Q So you're not familiar with the water content of manure at a compost facility?
A No, I am not.
Q When it's first brought to the facility and applied to compost area, you're not familiar with the moisture content?
A I believe I just answered that.

Q All right. And then what about moisture content when it's been sitting for a while?
A I believe I answered that also.
Q And you said you don't have any information about that?
A That's what I've said.
Q Okay. Do you believe that compost areas are a possible source of contamination?
A It's a potential source.
Q The charts that you put together for land application of manure, I believe you've said that fall nitrate levels were anywhere from 5 to 24 parts per million; correct?
A Are you talking about this table here?
Q Yes.
A Okay. And what was question again?
Q That fall nitrate residuals should be no higher than 5 to 24 parts per million; correct?
A Who made that statement?
Q I believe that's what you say, isn't it, in this chart? Isn't this chart done by you?
A That chart is a compilation of literature, but I don't say that fall soil nitrates should be between 5 and 24. What I'm doing is, I am summarizing and synthesizing the literature. These are researchers that have made recommendations about fall soil nitrate.
Q Okay. Do you agree or disagree that, at 15 to 30 parts

per million, there will be an increased risk of contamination to groundwater?

A That's -- I can't say that off the top of my head. There's many factors that go into what happens with a soil nitrate concentration versus when it will be an issue for groundwater.

And I think I testified earlier that these are recommendations that I found in the literature. They're based on soil scientists and agronomists. So that's -- I don't have a clear definition of what would and wouldn't impact groundwater quality.

Part of my job with doing this was to try and get a better handle on what these soil nitrate values mean, what the ballpark is, but I can't say for sure what any particular soil nitrate concentration, what that would be for groundwater.

Q You would agree, would you not, that nowhere in the literature supports the notion that fall soil nitrate tests of 45 parts per million would be protective of groundwater, don't you?

A I have not seen that statement in the literature, no.

Q And you haven't seen any literature that supports the notion that soil nitrate ranges above 45 parts per million are protective of groundwater, have you?

A I have not seen that statement in the literature, no.

Q Have you seen any statements in the literature that applications above 30 parts per million are protective of groundwater?

A So I think what you're confusing here is when you -- you're confusing what you see in the soils with groundwater contamination.

Q No. I'm talking about risks to groundwater. That's what your report talks about, doesn't it?

A But I've also testified previously that when you have a fall soil nitrate value, that there's a lot of site-specific information that goes into projecting what would be an impact to groundwater because what you have in the soils doesn't necessarily mean that that's what's going to be in groundwater.

There's a lot of factors in play. So these statements that you're -- these questions that you're asking me, I can't say one way or the other.

Q Okay. So what are the factors in play? Let's take a fall nitrate test at 30 parts per million on the west side in Washington and were tested after harvest. What happens -- at 30 parts per million, what's going to happen to the -- that 30 parts per million nitrate?

A So you have to know what the bulk density of the soil is. You have to know what the recharge is. You have to know what the aquifer materials are, what kind of -- what the

permeability of the aquifer is. You have to know what the hydraulic gradient is.

So there's a lot of things that you have to know for me to answer those questions.

Q Well, what are the things that you -- that's what I'm trying to get at.

What are those other things that you have to know? You just talked about some of them.

A Correct.

Q But on the west side, it rains a lot; right?

A It does.

Q And so if there's 30 parts per million in the soil on the west side, say, in Whatcom County, you know the soil types. You've done the Sumas-Blaine work up there. You know the soils are medium permeability generally; right?

A Correct.

Q So what's going to happen to that soil when it rains -- or the soil nitrate when it rains of 30 parts per million? Is it going to go to groundwater?

A Well, there's a risk that some of it will go to groundwater, but I can't say for sure how much or how -- where or when.

Q And what's the purpose of doing your evaluation if you don't make determinations? You didn't review the literature about what the risks were from that?

A I think I explained earlier that, to get to these numbers -- is this what you're getting at?
Q Yes.
A How we got to these numbers?
Q Yes.
A -- that we were looking for -- these are not -- these are not -- these are not compliance points. These are -- when you reach this benchmark, you have to take these specific actions.

So based on what we found in the literature and based on looking at what would be a potential impact to groundwater, we got a better sense of what's in the ballpark and who's out of the ballpark kind of information.

But we don't have specific criteria that says, if you have this soil nitrate value, what it will mean to groundwater. We have a better idea, but I can't say definitively what that impact would be.

Q But you would agree, wouldn't you, that there's no scientific literature saying that 30 parts per million is protective of groundwater?
A What I compiled is what the researchers stated, and some of them talked about -- so, for instance, Sullivan and Cogger in this table, in the very top one, they felt that if you had a soil nitrate of 15 to 20 parts per million,

that that was an acceptable level for corn -- oh, no. Wait. It was based on a crop type in Western Washington or Oregon, and if you go back to that document, it talks about corn and grass.

So this is an attempt to get an idea of what the researchers are saying, knowing that, like, Sullivan and Cogger is talking about Western Washington, and they're talking about specific crops.

But when you start to pull all this together, you start to get an idea, but these -- we don't have enough information to say these are hard-and-fast compliance numbers, and that's why they're used as benchmarks in the adaptive management matrix.

Q But you do agree that excessive category would be 30 parts per million or higher; correct?

A What we've determined, based on what we've seen in the literature, is -- and our goal with this permit, is to try and keep soil nitrate to 30 parts per million or less.

Q So if continued applications at 30 parts per million or more would cause concern for continued discharge groundwater, wouldn't it?

A Well, based on our required actions in the adaptive management matrix, we're directing them, and if they don't follow these required actions, then it would be a

permit violation.

So, again, going back to applying the right amount at the right time to the specific crop. So ideally, if they're doing that, they're going to have lower soil nitrate values.

So all of those adaptive management actions are designed to put them into a low or medium risk category.

Q I'm going to go back to the lagoons for a moment.

Have you ever reviewed a lagoon study that shows that manure lagoons don't leak?

A I've reviewed studies on manure lagoons, some of which look at leakage and some of them looked at impacts to groundwater.

So just clarifying, so you're specifically asking me if I have ever seen a study that said there was no leakage from a lagoon?

Q Correct.

A No. I have not seen that.

Q Okay. And the preponderance of the evidence shows that manure lagoons impact groundwater; correct?

A So there was one study that we looked at that did not show impacts, but all the rest of the studies that I looked at did show impacts.

Q All right. And the one study was one lagoon and a study of four lagoons; correct?

A Well, they were individual studies, but, yes, it was -- they -- then Dennis Erickson compiled those into one report, but they were also standalone individual reports.
Q Okay. And you would agree that once liquid escapes a lagoon, it has only one place to go, down to groundwater?
A Primarily.
Q And that the only way to determine whether impacts exceed groundwater quality standard is to do groundwater monitoring; correct?
A Well, so part of what Ecology has done in the past was to try and determine from lagoon permeability what would be an acceptable leakage rate that would be in compliance with the groundwater quality standards.

And so part of the rationale for doing that modeling work was so that we -- when we put something like a permeability in a general permit, we would have a fairly high level of confidence that if a lagoon was built to those standards, that it would be meeting the groundwater quality standards.

So we feel confident that what we have in this general permit will meet groundwater quality standards.
Q Were you involved in reviewing any of the surface water monitoring information for the permit?
A No, I was not.
Q Okay. Let me just show you A-51.

Have you ever seen this document before?
A No, I don't believe I have.
Q All right. Are you familiar with the concept of tile drains?
A Vaguely.
Q Okay. Are you familiar with how they're used in farming practices?
A Yes. Yes.
Q Okay. And they're used to drain soil?
A Yes.
Q Okay. And have you ever tested any soil drains, seen any soil drain -- tile drain -- sorry -- tile drains in practice?
A No, I have not.
Q Do you agree that remediation of nitrate contamination is very difficult and expensive?
A Yes, I do.
Q And have you ever made an assessment of what it would cost to remediate the Sumas-Blaine Aquifer?
A For the Sumas-Blaine, I don't believe I have.
Q Would it be in the millions of dollars? Tens of millions of dollars? Hundreds of millions of dollars? Do you have any idea?
A I couldn't say.
Q But certainly in the millions?

A I couldn't say.
Q Do you believe that in order to be degrading water quality, that you would have to be violating water quality standards?
A Can you say that again?
Q Yes. In order to be degrading water quality, do you believe that the -- a discharge or an impact has to be above the water quality standards?
A I guess that depends on your definition of degradation.
Q Well, that's what I'm asking you. Is degradation anything over background?
A So I typically use the word when something has been contaminated versus impacted. So I use the word "contaminated" for when it exceeds a standard.
Q Okay. Let's use the word "impact."
A Okay. No. You can -- it does not have to exceed any groundwater standard to have an impact.
Q To be impacted. Okay. And so that would be a degradation of the beneficial use if it would impact it?
A Oh, I see what you're saying. Okay. So, yeah, degrading a beneficial use means that beneficial use is no longer available. So, yes, that would be contamination.
Q That would be contamination above the water quality standard?
A Yes.

Q That particular situation?
A Yes.
Q But you could still be impacting groundwater without violating a water quality standard; correct?
A Correct.
Q Okay. Let's take a look at Exhibit A-10, please. And you have that in front of you?
A I do.
Q Is that a document that you created?
A Tech Note 23 was created by the NRCS.
Q Okay. I think we have the wrong --
A What document did you say?
Q Yeah. We have the wrong document. A-10.
A Oh, I have R-10.
Q That's all right. It happens.
A Okay. Same one as you now.
Q And is that a document you created?
A No.
Q Do you know who created this document?
A I have no idea.
Q Have you ever seen this document before?
A You know, it may have been shown to me at my deposition, but I can't recall.
Q Is this -- isn't this entitled "Draft Manure and Groundwater Literature Review"?

A Yes, it is.
Q And was this not something that you used in preparation of your manure and groundwater literature review?
A No, I did not. I've never seen this document before but maybe at my deposition.
Q Okay. Let's take a look at A-13. Is this a document that you're familiar with?
A No, it is not.
Q Were you involved in the preparation of the answers that appear in this document at all?
A No, I was not.
Q You weren't asked by Bill Moore or John Jennings for help in answering these questions?
A No, I was not.
Q Okay. Okay. Let's take a look at A-15.
Have you seen Exhibit A-15 before?
A I'm not positive. I'm trying to read it right now.
Q Okay. Take your time.
A Okay. What's your question?
Q Yes. Are you familiar with this document?
A I just read it.
Q For the first time?
A I don't know if I've seen it before. It doesn't -- I don't recall seeing it.
Q Okay. And so you don't think you drafted it?

A No. I did not draft it. I know that.
Q Have you ever had a discussion within Ecology of what the definition of impact to groundwater is?
A I don't know that I have.
Q All right. Let's take a look at A-16.
A Okay.
Q This might be something you're familiar with?
A Yes. I recognize this one.
Q This one has your name on it?
A Yes, it does.
Q All right. So you drafted this, of course?
A Yes. I wrote this paper.
Q All right. And let's take a look at Page 3.
Is this an original composition of yours?
A You know, I may have had input from some of the other hydrogeologists in the water program at that time, so I can't say for sure that it was all me. I can't remember.
Q But you were the primary author?
A Yes, I was.
Q Okay. And on Page 3, you talk about microbial pathogens; correct?
A Yeah. The top paragraph?
Q Yes.
A Mm-hm.
Q And the conclusion is, "Therefore" -- if you can read

that sentence to us, please?
A The third paragraph?
Q Yes.
A "Therefore, if microbiological pathogens are not removed or treated in the unsaturated zone and they are allowed to migrate to groundwater, they can be transported great distances potentially contaminating groundwater and affecting drinking water wells, surface water bodies, and shellfish habitat."
Q Okay. Are you familiar with some lagoons in Whatcom County that are built into the groundwater table?
A No, I am not.
Q Okay. You haven't seen any information that indicates that?
A No, I haven't.
Q If a lagoon were to be built into the groundwater table --
A Mm-hm.
Q -- would that cause the concerns that you just read in that sentence?
A Absolutely.
Q Are you familiar with the '94 Erickson study? Dennis Erickson; right?
A Yeah. Dennis Erickson.
Q Few Ericksons at play here so want to make sure we get

them right.
A Which study exactly was '94? Off the top of my head, I can't remember. Oh, I have it here.
Q R-11, yeah.
A Oh, R-11. Oh, not A-11. Okay.
Q Okay. So you're familiar with that Erickson study?
A Yes.
Q And didn't that study discuss lagoons that were in Whatcom County that were built right into the groundwater table?
A That's not what I call -- recall from this study, but that may be the case.
MR. TEBBUTT: While we're waiting, I move into evidence A-16.
JUDGE FRANCKS: A-16 is admitted.
(Exhibit No. A-16 admitted.)
A I don't believe that report -- I mean, I'm reading the executive summary, and it doesn't state that, so --
Q (By Mr. Tebbutt) Let's take a look at Table 1 in R-11.
A What page would that be on?
Q 41.
A Okay. Good. Okay.
Q And do you see the table talking about, the right-hand column, separation distance in feet of the lagoons?
A Yes.

Q So does that indicate whether lagoons are built into the groundwater table or not?
A Yes. That's what it says.
Q Okay. Does that familiarize yourself then that some lagoons in Whatcom County are built into groundwater table?
A That's -- that's my impression from this table.
MR. TEBBUTT: Okay. I'd like to move into evidence R-11.
JUDGE FRANCKS: R-11 is admitted.
(Exhibit No. R-11 admitted.)
Q (By Mr. Tebbutt) So the lagoon assessments that the permit requires, some of them aren't really necessary, are they, because there's information that would show that a lagoon is discharging to groundwater?
A You're asking me if lagoon assessments are unnecessary?
Q In certain circumstances, where a lagoon is built into a water table, you don't need to do a lagoon assessment, do you? You would know that there's a problem?
A Well, I think the idea behind Tech Note 23 is to get a full assessment on the lagoon, and that's a requirement of a permit. So I don't think that we would be waiving that requirement.
Q Right. But what I'm saying is, you don't need to do that if you know that a lagoon is built into a water table;

correct?

A If we know that the seasonal high water table intersects the bottom of the lagoon, that that would be an issue, yes, that would be an issue.

Q All right. Take a look at Page 7, please.

A 7 of --

Q A-16, same document.

Now, dairy lagoons -- do you have it in front of you? I'm sorry. A-16, Page 7.

A This is R. Sorry.

Q I know there's a lot of stuff there.

A A-16, Page 7.

Q Yes.

A Okay. I'm on the same page.

Q Okay. Dairy lagoons are the only lagoons, wastewater impoundments, in the state that don't require synthetic liners; correct?

A No, that is not correct.

Q What other wastewater impoundments do not require synthetic liners?

A I know there's other types of impoundments, and there's various different conditions based on the type of industry.

And I think Bill Moore would be able to speak to that better about specifically what the different kinds

of requirements are because, in his job, he managed a lot of different kinds of permitted activities.

Q Okay. You authored A-16; correct?

A Yes.

Q And if you would please read where it says "Additional concerns," the second bullet point, out loud.

A Okay. "There's a discrepancy between the construction standards for dairy lagoons, and those standards are required for all other waste impoundments.

"In order to obtain equal protection for groundwater and to comply with 173-240 WAC, manure lagoons should be designed construct and installed consistent with the requirements for other waste impoundments."

Q And doesn't that include synthetic liners or other waste impoundments?

A But that doesn't say that all other waste impoundments have synthetic liners.

Q Most of them do, don't they?

A I can't characterize it like that.

Q Isn't that what the discrepancy is? Don't dairy lagoons have a much lower threshold for construction and operation than other wastewater impoundments in other industries?

A I would have to go back and read the document more fully to understand what exactly the discrepancy is, but it's

not clear from this paragraph. And I wrote this back in 2002.

Q Okay. Why don't you read it then.

A Okay.

Q Just let me know when you have enough context to answer the question.

A I believe it's related to -- well, the title of the document is "Construction of Dairy Lagoons Below the Seasonal High Groundwater Table."

So on Page 3, there's a paragraph titled "Consistency with Washington State's Regulatory Philosophy," and it talks about lagoons being constructed below the seasonal high water table.

So my assumption is, that's the issue at hand, and that's what we're talking about. In fact, if you turn the page, on Page 4 it talks about the underground injection control program, reclaimed water standards, Department of Health on-site sewage systems, and Ecology stormwater manual, and it talks about the minimum vertical separation with the water table.

So I believe that's the discrepancy that this last paragraph is talking about.

MR. TEBBUTT: Okay. Your Honor, may we just break for the day. We'll get going in the morning again.

JUDGE FRANCKS: That would be fine.

MR. TEBBUTT: All right. Thank you.

JUDGE FRANCKS: All right. So we'll start again at 9:00 and don't touch those clocks. We are off the record.

(Proceedings adjourned at 4:40 p.m.)

C E R T I F I C A T E

I, ANDREA L. CLEVENGER, a Certified Court Reporter in and for the State of Washington, residing at Olympia, authorized to administer oaths and affirmations pursuant to RCW 5.28.010, do hereby certify;

That the foregoing proceedings were taken stenographically before me and thereafter reduced to a typed format under my direction; that the transcript is a full, true and complete transcript of said proceedings consisting of Pages 200 through 409;

That I am not a relative, employee, attorney or counsel of any party to this action, or relative or employee of any such attorney or counsel, and I am not financially interested in the said action or the outcome thereof;

That upon completion of signature, if required, the original transcript will be securely sealed and the same served upon the appropriate party.

IN WITNESS WHEREOF, I have hereunto set my hand this 18th day of June, 2018.

(Court Reporter, CCR No. 3041)