

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) PCHB No. 17-016(c)
TOPPENISH CREEK, SIERRA CLUB,)
WATERKEEPER ALLIANCE, CENTER FOR)
FOOD SAFETY, and RESOURCES FOR)
SUSTAINABLE COMMUNITIES,)
)
Appellants,)
)
vs.)
)
STATE OF WASHINGTON, DEPARTMENT OF)
ECOLOGY,)
)
Respondent.)

HEARING
VOLUME VI
June 5, 2018
Olympia, Washington
Pages 1117 through 1379

Taken Before:

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1 BE IT REMEMBERED that on Tuesday, June
2 5, 2018, at 1111 Israel Road SW, Olympia, Washington, at
3 9:01 a.m., before ANDREA L. CLEVINGER, CCR, RPR, the
4 following proceedings were had, to wit:

5

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7

8 JUDGE FRANCKS: Have a seat. Good
9 morning. Let's go on the record. We are here for Day 6
10 of PCHB No. 17016C, and we are going to commence with
11 another dairy federation witness.

12 MS. NICHOLSON: Yes. We're calling
13 Dr. Joe Harrison.

14 JUDGE FRANCKS: Welcome. The court
15 reporter is going to swear you in.

16

17 JOSEPH HARRISON, PH.D., having been first duly sworn
18 by the Certified Court
19 Reporter, testified as
20 follows:

21

22 DIRECT EXAMINATION

23 BY MS. NICHOLSON:

24 Q Morning, Dr. Harrison.

25 A Good morning.

1 Q You're going to need some of those exhibit books behind
2 you. Could you please pull out Exhibit I-1, and it's
3 going to be the really big binder.

4 A Okay.

5 Q And is that your current resume?

6 A Yeah. As of January 2017.

7 Q Can you give us kind of a little bit of an overview of
8 your academic experience. Your resume is rather
9 extensive.

10 A Okay. So I just started my 35th year with Washington
11 State University last Friday. And when I first started
12 with WSU, I had 100 percent other research deployment
13 with forages from a dairy nutrition standpoint, but
14 working with agronomists and soil scientists as a team to
15 look at forage utilization for dairies particularly in
16 Western Washington.

17 And then so the concept was that if, between the
18 soil scientist and the agronomist, they could fertilize
19 and grow the crops, and my job was to feed the animals.
20 So it was a team approach.

21 As part of that, we worked with a -- what was called
22 the Dairy Forage Facility at Buckley, Washington, 200-cow
23 dairy.

24 And I had -- I was a faculty member responsible for
25 that operation, and coordinated with the staff for

1 management of the animals and facilities as well as
2 manure handling.

3 During that time I was also involved in two
4 enhancements in those facilities, to put in contemporary
5 animal handling facilities as well as manure management
6 aspects of the mineral lagoons, liquid-solid separators,
7 irrigation systems, and so forth.

8 As time progressed through the decades, I then
9 became interested more in looking at forages in a whole
10 farm standpoint. A study in 1995, 1996 at Michigan State
11 University with a federal agricultural research service
12 scientist, Al Rods (phonetic).

13 And as a part of that whole farm look at forages, I
14 also became more interested in nutrient management at the
15 whole farm level, and was involved with providing
16 enhancements to the model that Dr. Rods had developed.

17 Q Can you talk a little bit about your specific dairy
18 experience.

19 A So with regard -- so in addition to the dairy in Buckley,
20 also have -- currently have responsibilities as a faculty
21 liaison to the WSU dairy in Pullman.

22 We have about 200 cows there. Some main herd that's
23 for research and teaching purposes, and there's also a
24 sub-herd within it of -- a student-run herd called CUDS,
25 Cooperative University Dairy Students, that they also run

1 their own herd side. Picked up a teaching appointment in
2 the last couple years as well.

3 And all the milk from that dairy goes through the
4 creamery in Pullman Ferdinand's where they produce the
5 Kerrygold cheese and ice cream there on campus.

6 Q Great. So you -- sounds like your research has multiple
7 disciplines. You're usually working in a team.

8 Is that because it's more practically focused rather
9 than academic focused or --

10 A Yeah. I guess, regards to whether it would be practical
11 or -- it is more on the practical side than on the basic
12 side, but the challenges out there just require more than
13 one scientist to be involved.

14 So tend to work with agronomists, soil scientists,
15 ag engineers, microbiologists, veterinarians, on all
16 those projects.

17 Q And is that similar to your work with LPELC and can you
18 define what that stands for?

19 A Yes. So the Livestock Poultry Environmental Learning
20 Center is one of the extension education outreach
21 programs I've been involved with for the last dozen
22 years.

23 Over the last few decades, we've seen a dwindling of
24 faculty at the universities that can address manure
25 management. So a national level, a group of us decided

1 that it would be prudent to try to work together.

2 And so we were able to acquire federal funding on a
3 water quality variant initially to fund the center. It's
4 a virtual center kind of hubbed out of Nebraska, but we
5 have over a hundred people across the whole U.S.

6 After the first five years, then we were able to
7 acquire some money related to air quality issues in
8 agricultural. So we still maintain an interest in
9 education on the water quality side, but we moved into
10 air. And then most recently, we also had funding for
11 five years related to climate change.

12 So the center is pretty much anything manure and all
13 livestock species. We have monthly webinars that are
14 held nationally third month -- or third Friday of every
15 month. We have a monthly newsletter that's sent out, and
16 we have a list where people can ask questions, get
17 answers on topics from their fellow experts around the
18 U.S.

19 Q And what was the recent -- fairly recent topic on your
20 webinar?

21 A So I'm on the -- in addition to being on the leadership
22 committee -- overall leadership committee for Livestock
23 Poultry Environmental Center, I also serve on the
24 committee that determines Web cast and provides some
25 guidance for that.

1 And with the interest particularly in our region,
2 but also nationwide, with regard to lagoons, I became
3 aware of some technology that was forthcoming to be able
4 to manage -- to measure seepage rates in lagoons and also
5 look at actual potential leakage in lagoons.

6 There's two different technologies. One is a system
7 that measures the eight-hour period, or overnight is what
8 they recommended. The seepage rate on the lagoons,
9 fairly precise, and the -- then the other one is
10 electrical array set of rods that goes down alongside the
11 lagoon.

12 We can actually measure conductivity which gives you
13 an indication of whether the lagoon has excessive
14 movement of moisture out of the lagoon.

15 So we -- I hosted a webinar on that about two years
16 ago, and as a result of that, we actually have seen that
17 equipment become available through the western center of
18 NRCS out of the Portland office, and it's available for
19 use by dairies to look at seepage rates on their lagoons.

20 Q So this is technology that's available now? You can
21 precisely calculate a seepage rate?

22 A Yeah. It's currently available.

23 MR. TEBBUTT: I'm going to object and
24 move to strike to remove all this as irrelevant and
25 beyond the scope of Mr. Harrison's report.

1 He didn't once mention anything about lagoon leakage
2 or seepage in his expert report, so it's well beyond the
3 scope.

4 MS. NICHOLSON: He's explaining his
5 experience and background and why he has the expertise
6 that he has.

7 JUDGE FRANCKS: I'm going to allow it.

8 Q (By Ms. Nicholson) Dr. Harrison, can you talk a little
9 bit about who funds your research?

10 A So about mid-career, I kind of moved from one end of the
11 county to the other. So I still do nutrition work, still
12 do the forage work, but we also do a lot of nutrient
13 management work, so look at aspects of a variety of
14 aspects of manure management and, in particular, try to
15 explain it as we're looking at -- particularly as it
16 relates to fate and transport of both nutrients and
17 pathogens with manure systems.

18 And that work has primarily been funded through
19 NRCS, Natural Resource Conservation Service, at the
20 federal level through their program called Conservation
21 Innovation Grants.

22 They also went through decades of reduction in staff
23 and got to the point where they were able to do their own
24 research. They relied more heavily on external teams to
25 do the research.

1 So through those Conservation Innovation Grants, we
2 had particularly focused on nutrients and their fate to
3 transport and the environment as well as pathogens.

4 Q So can you talk a little bit about pathogens.

5 Does that include viruses?

6 A Okay. So the work we did with the Conservation
7 Innovation Grant on aerobic digesters and pathogens was
8 still to look at -- so you start out with manure on the
9 farm.

10 Then it goes through the inner digester, produces
11 methane gas that's used for electrical generation, but
12 the subsequent liquid and solid streams are used for
13 bedding for the cows. They're used for compost or they
14 can be used for land application for crop and irrigation.

15 So we monitored manure through each one of those
16 steps, and as we did, we had those assayed through our
17 veterinary school in Pullman and the microbiology group
18 there for a number of pathogens that would be of concern
19 for the cattle.

20 But we also were of interest for looking at
21 organisms that would be of zoonotic concern, and zoonotic
22 means pathogens or bacteria or in a case, I guess, lump
23 viruses in with that as well, if there were viruses that
24 had a concern that were of in this case cattle origin,
25 which would have -- be transferred and be a concern with

1 humans.

2 So we did look at some, you know, a number of the
3 microorganisms, but from a virus standpoint, there really
4 aren't any viruses that are of cattle origin which are
5 then going to be of a concern for humans.

6 Q So would you -- do you agree or disagree with the
7 Ecology's concern that they need extra -- an extra foot
8 of attenuation for viruses?

9 A Yeah. So during the proceedings over the last two weeks
10 ago, I listened to a suggestion that there needed to be
11 an attenuation area for attenuating or killing or
12 reducing a number of virus below the lagoon.

13 And since there aren't viruses from cattle that are
14 of human concern, it would seem that's not really a good
15 justification for that particular attenuation phase.

16 Q Can you talk a little bit about your specific experience
17 with CAFOs?

18 A Okay. So same group of people at the national level that
19 worked -- colleagues like myself worked on the coming
20 together for the Livestock and Poultry Environmental
21 Learning Center about a dozen years ago.

22 Prior to that, a group of us worked with EPA at the
23 national level when the CAFO permit -- the CAFO permit
24 was released.

25 In approximately 2000, it went through some reports,

1 and I think the final version that was released in about
2 2003.

3 Our effort as a group was to try to take the
4 language that was in these permits and try to put it into
5 fact sheets which could be understood by advisors to
6 producers as well as the producers themselves, so trying
7 to describe in a way that could be commonly understood by
8 those that are going to be, you know, actually putting
9 the permits in place on farms.

10 MS. NICHOLSON: I'm going to move to
11 admit Exhibit I-1.

12 Q (By Ms. Nicholson) And ask you to look at Exhibit I-2
13 and tell us what that is.

14 JUDGE FRANCKS: I-1 is admitted.

15 (Exhibit No. I-1 admitted.)

16 A I-2 is expert report.

17 Q (By Ms. Nicholson) Is that the expert report you drafted
18 in this appeal?

19 A Yes.

20 Q Dr. Harrison, there's been some testimony that might be a
21 little confusing for the board requiring -- about
22 requirements dairies including CAFOs must comply with.

23 Can you explain to the board the requirements that
24 all dairies must comply with?

25 A So a bit of history, 20 years ago this year, so 1998, the

1 dairy industry requested of the Washington State
2 legislature to pass what's called the Dairy Nutrient
3 Management Act of 1998.

4 And the intent for that act was to require that the
5 dairy industry -- all dairies in the state, regardless of
6 size, no matter small dairy or large dairy, small number
7 of cows or large number of cows, you were to be required
8 to get one of these to be, you know, under that law.

9 And kind of simply put, the concept of it was that,
10 with the nutrient management plans that were required
11 that you had to collect the manure, you had to store the
12 manure, and then you had to apply the manure in an
13 agronomic rate.

14 It's kind of a two-phase process because it was
15 fairly new to the industry. The other thing that was
16 interesting at the time was that a few other states that
17 were requiring large operations to have nutrient
18 management plans, the -- they weren't requiring all.

19 In Washington, they decided that everybody needed to
20 play by the same rules, and so all dairies are required
21 to have this.

22 So they had -- the first phase was to develop the
23 plans, and those were developed by conservation district
24 staff typically and in a few cases some consultants. And
25 the guidelines for developing those plans were the NRCS

1 practice standards.

2 And then in the subsequent about two-year period,
3 they were to implement those plans and at that point then
4 certify that they were implemented and actually in
5 practice.

6 Q So would this include manure lagoon design as well?

7 A Yes, it did.

8 Q So since 1998, all dairies, regardless of size, must
9 comply with NRCS guidelines under the Dairy Nutrient
10 Management Act?

11 MR. TEBBUTT: Again, objection. This
12 is well beyond the scope of the expert report. There's
13 nothing in there that discusses all of this, and it's
14 well beyond the scope.

15 MS. NICHOLSON: Again, this is part of
16 his experience. He's been doing this for over 30 years,
17 and he has the experience to speak to the history of the
18 Dairy Nutrient Management Act, and he's trying to clarify
19 what requirements dairies are under.

20 MR. TEBBUTT: Should have been part of
21 his expert report. This is unfair.

22 JUDGE FRANCKS: Well, I'm going to
23 allow it. And you'll have a chance on cross-examination
24 to --

25 MR. TEBBUTT: Right. But the whole

1 idea is preparation, and that's why we had expert
2 reports, and they're going beyond the scope of it.

3 MS. NICHOLSON: The expert reports
4 were not required in this matter. We voluntarily put
5 them out there.

6 It's not like that anybody is strictly held to
7 anything within the expert report. That's not what the
8 point of it was.

9 It's not like we submitted them in lieu of
10 testimony, and he was also deposed.

11 JUDGE FRANCKS: I'm going to allow him
12 to testify about this.

13 A So ask the question. I think it had to do with following
14 the standards.

15 Q (By Ms. Nicholson) I think it did.

16 A So, yeah, to my understanding, lagoons built since 1998
17 would have been required to meet the NRCS standard.

18 Q And what inspections are included in that -- under that
19 act?

20 A So as a part of the Dairy Nutrient Management Act
21 currently, the dairies that receive an on-site inspection
22 by staff members from the Department of Agriculture every
23 18 months.

24 And the reason for that 18 months is so that you can
25 move around the course of a calendar year so that you

1 aren't always getting inspections when the weather is
2 really nice.

3 I mean, so if you're skipping around at an odd
4 number of months, then you don't also get a visit when
5 it's not so nice.

6 Q Thank you.

7 Could I have you look at Exhibit I-49, please.

8 A Okay.

9 Q And here you might need your pointer.

10 And is this a figure that you included in your
11 expert report?

12 A Don't know if it was with the expert report.

13 Q It's a figure that you drew to explain the nitrogen
14 cycle?

15 A Yes. Nitrogen cycle. And this cycle has been discussed
16 and presented in various forms.

17 Q Can you give us an overview of the nitrogen cycle in
18 relation to plant growth and crop nitrification?

19 A So if we envision up here where it says "nitrogen cycle,"
20 it's kind of being the soil -- soil surface level here.

21 Normally what I do with this diagram is kind of step
22 into it and bring pieces of the -- but you're getting it
23 all in one full blast here, so bear with me.

24 So all these processes, as we go from, say, nitrate
25 to ammonium and organic nitrogen, these are all processes

1 which are driven by bacteria.

2 And, in contrast, the pathogenic bacteria, which has
3 been brought up during this hearing, these are good
4 bacteria, bacteria that we actually like to promote their
5 growth and their function.

6 So when manure is applied, it's primarily in the
7 ammonium form. Very little, if any, nitrate in manure
8 itself, even lagoon stored.

9 And so once it's in the soil, the first form then is
10 ammonium, and that goes through the process called
11 nitrification, bacteria to nitrate.

12 And the nitrogen tends not to stay in this ammonium
13 form because the process is overwhelmingly driven towards
14 nitrate, and actually the crop tends to prefer nitrate as
15 a nitrogen source as well. So that step is called
16 nitrification.

17 The other -- then nitrate can also certainly be
18 taken up by plants. Nitrate can also be immobilized here
19 on this left side where the bacterial breakdown in the
20 organic from fraction, which then that's a more stable
21 form in the soil.

22 That organic fraction, whether it comes from manure
23 or from bacteria processes and so forth, are roots of the
24 plants then can be what we call mineralized.

25 We've heard that mentioned before in the hearing,

1 but it brings it back around to the ammonium. So all
2 these things are current at the same time at different
3 rates and are all affected by water and temperature.

4 Then some other arrows here that are important to
5 note. We've got one here where if ammonia is, say,
6 applied on the surface of the soil, you can have some
7 ammonia losses, and then that wouldn't be available for
8 plant uptake, so that's a volatilization step.

9 And then we have -- when ammonia comes on over to
10 nitrate, we have this denitrification, which nitrogen gas
11 can go off to the atmosphere or it can go off as nitrous
12 oxide.

13 There's one arrow that's not on here, and there
14 should be an arrow here on the left that would go from
15 nitrate and point downward where we can have movement of
16 nitrate through the soil, as has been mentioned over the
17 last two weeks ago.

18 Q So does this include the cycle of nitrification-
19 denitrification?

20 A Yeah. So that was brought up this week, two weeks ago as
21 well, this process of taking ammonia through a
22 nitrification step to nitrate and then a denitrification.

23 So there's this -- what's considered -- what's --
24 the term is coined coupled nitrification-
25 denitrification.

1 So that would take ammonia to nitrate and then the
2 nitrate on to nitrous gas or -- nitrogen gas or nitrous
3 oxide.

4 Q Is there a source that you rely upon for your information
5 on coupled nitrification-denitrification?

6 A Recently in this hearing, it was mentioned as it related
7 to the Baram paper where they suggested that, under the
8 layered lower point of the lagoon, that ammonia coming
9 out of the bottom of the lagoon could actually be
10 converted to nitrate and then on to nitrogen gas.

11 So that would be the -- that coupled biological
12 reaction.

13 Q Could I have you look at Exhibit R-20, which is behind
14 you in the Ecology books.

15 And is that the paper you were referring to?

16 A Yes. This is the Baram paper. It's been discussed two
17 weeks ago.

18 Q And where was this paper published?

19 A Pardon?

20 Q Where was this paper published?

21 A The journal is Journal of Environmental Quality.

22 Q And is that a reliable source?

23 A Yes. The Journal of Environmental Quality is in the
24 academic world called a high impact factor journal. I
25 published one paper in the journal a number of years ago.

1 So I got some sense of rigor, but they require
2 that -- it's a journal that really wants to publish new
3 findings and findings of particular significance.

4 Q So would you consider Mr. Baram's discovery of coupled
5 nitrification-denitrification to be a new and important
6 discovery in this field?

7 A Yeah. I think -- well, I guess I wouldn't couch it as
8 they discovered it, but the results of the paper and then
9 connecting that with this coupled reaction certainly
10 helped explain the variability that's seen in studies
11 relating to what happens to nitrogen under manure
12 lagoons.

13 MS. NICHOLSON: Okay. I would like to
14 move to admit I-49 and I-2.

15 JUDGE FRANCKS: I-49 and I-2 are
16 admitted.

17 (Exhibit Nos. I-49 and I-2
18 admitted.)

19 Q (By Ms. Nicholson) And can you take a look at Exhibit
20 I-50, please.

21 A Okay.

22 Q And before we begin, can you explain the difference
23 between a fall soil nitrate test, a PSNT, a pre -- you'll
24 have to define that one -- and the spring soil test.

25 A Okay. So in a world of management of manure for crops,

1 that is a part of that, part of that system, using soil
2 samples. Typically think about three different time
3 periods where we would take samples.

4 So one would be considered spring. And to give
5 the -- everyone a bit of a feel for that, depending on
6 when spring occurs, it's really that time of the year
7 when we could actually see a beginning of grass growth or
8 crop growth.

9 So in some cases, that could be as early as February
10 or it could be as late as May, depending on the region.
11 In our region, certainly we have green-up or the growth
12 of the crop as early as February. So we have pretty wide
13 window then for when a spring test can be taken.

14 Then there's a second test -- and that could be for
15 any crops. There's a second test that's called the PSNT,
16 so it's called Pre-Sidedress Nitrate Test, and that
17 particular test is really specific to corn.

18 The concept is that that test is taken in the early
19 growing season of the corn, so it's really outside of the
20 spring window. It's in early -- well, I wouldn't really
21 consider early summer, which would be the late May to
22 early June, and right now.

23 And that test is taken when the corn is about
24 six-leaf stage, so it's about this high. So you want to
25 get the corn at a low stage of growth, so height, get a

1 soil sample, determine whether or not there looks like
2 there's enough nitrogen there for the rest of the growing
3 season for that corn crop and -- at that point in time.

4 So then you can decide, yeah, might want to add some
5 supplemental nitrogen, or, no, it looks like the crop
6 will do fine and go all the way through September or
7 October.

8 The reason for taking the test then is the crop is
9 low enough, if you then run equipment through the field
10 to apply extra nitrogen, you aren't going to damage the
11 crop.

12 So those are the first two tests, so spring test and
13 then the Pre-Sidedress Nitrate Test, which is really an
14 early summer test.

15 The third test is the fall soil nitrate test, and
16 that's typically taken at -- well, it is taken in the
17 fall.

18 Q Can you look at -- well, first of all, are you familiar
19 with the CAFO permits in this matter?

20 A Yes.

21 Q Both the State and the combined?

22 A Yes.

23 Q Could you pull up R-2, which is one of the CAFO permits,
24 and go to Page 48 -- nope. 17. PDF Page 17.

25 A You said R-2; correct?

1 Q Yeah.

2 A And you said Page 17?

3 Q Yes. And what section I'm looking for is S4.I.1.

4 A Okay. I'm there.

5 Q Actually, in that entire section, can you explain which
6 of the tests that you just described are required under
7 the permit terms?

8 A So the spring test and the fall test are the two tests
9 that I am aware of that are part of the permit.

10 Q So the PSNT, which applies only to corn, is not required
11 under the permit?

12 A I did not see it in the permit, no.

13 Q I'm going to have you look at Exhibit R-4.

14 And are you familiar with Exhibit R-4, which is the
15 literature review?

16 A Yes.

17 Q Could you turn to Page 48 in PDF, and it's going to be
18 Page 46 for you, Dr. Harrison.

19 A Okay.

20 Q And it's kind of throughout this section, Pages 41
21 through 46 for you, Pages 43 through 48 in the PDF.

22 Looking at this lit review, is it correctly equating
23 PSNT and the spring soil sample?

24 A Well, as I read through it originally -- I actually had
25 an opportunity to listen to Ms. Redding present this at

1 an EPA CAFO meeting a few years ago as well -- it -- one
2 could be a bit confused that the spring test and the PSNT
3 are -- that there's kind of a mixing when those are
4 discussed.

5 Particularly, if you look on Page 46, it says
6 "spring soil nitrate test" and then it says, parentheses,
7 "Pre-Sidedress Nitrate Test." That's really not a spring
8 test.

9 So if one were to go back to the literature review
10 as a backup to the permit, I think one could be somewhat
11 confused.

12 Q And do you think that this literature review contains a
13 clear analysis of why spring soil nitrate tests are
14 required?

15 A You know, as I reviewed this recently, I -- I'm not
16 seeing that clarity.

17 Q Could you -- let's see. I think we need to go back to
18 Exhibit I-50.

19 A Okay. I got that one.

20 Q And just to begin, do some crops use more nitrogen than
21 others?

22 A Yeah. So if we look at Panel A and Panel B, Panel A
23 being the top panel here, it's grass. We have Panel B on
24 the bottom.

25 So the grass can take up as much as four to five

1 hundred pounds of nitrogen during a growing season and
2 has a much longer growing season. So that's the major
3 reason it can take up more nitrogen than a corn crop can.

4 Corn crops can be somewhere in the neighborhood of
5 maybe 200 to 250, depending on Eastern Washington versus
6 Western Washington. We get much higher yields because of
7 the heat in Eastern Washington, so grass is going to
8 consume a lot more nitrogen or uptake a lot more
9 nitrogen.

10 Q And what effect does plowing or aeration of the soil have
11 on it?

12 A In management of soil for crops, particularly for corn, I
13 guess you're going to plow that every year, or if in the
14 grass you've got a grass sand that's beginning to fail,
15 you've got a lot of spotty places, got an encroachment of
16 weeds and you want to reseed that, so it would be a nice
17 lush expand again.

18 When that soil is tilled, it kicks off all this
19 bacterial action that breaks down the organic nitrogen
20 there, and we get a rather large pool of nitrate that's
21 formed when that land is prepped, so any land prep.

22 So that's one of the reasons why there's been an
23 interest in moving towards minimal or no till practices.

24 Q Can you give us an overview of the common cropping
25 methods and the types of crops grown in the state?

1 A So in Western Washington, we certainly see -- I kind of
2 use the thumb rule 50, 50 plus percent of our land
3 acreage is grass, and the other half is about -- is in
4 corn or corn silage.

5 On the east side of the state, we have limited
6 grass, but we have a lot of alfalfa because it's a good
7 environment there for alfalfa and good soil conditions
8 from the standpoint of moisture, and then the rest of it
9 will be corn.

10 In addition, over the last 15 years, we've seen a
11 big increase with the corn crop that what producers will
12 do is, they'll grow the corn crop, say, from about May
13 through September, October, and then right after that,
14 they grow a second crop, which is most often triticale.
15 Sometimes they'll plant wheat or some other small grain,
16 but most of the time they plant triticale to have --
17 well, to protect the soil, for one thing, but also to
18 utilize the nutrients that might be left there after the
19 corn crop.

20 Q Is that what double cropping is?

21 A Yes. In this case, considered double crop because you
22 get two crops, or the other term that's used for that
23 second crop is a cover crop.

24 Q Okay. I'd like to turn to the exhibit -- and, actually,
25 you can look over your left shoulder because I'm going to

1 talk a little bit about Table 3. We could also pull that
2 up. That's S4.K in the permit.

3 And what tests are they -- what test are the actions
4 taken from in this table? Is this the fall soil nitrate
5 test?

6 A Yes. The adaptive management suggested in Table 3 is a
7 result of obtaining a fall soil sample and then looking
8 at the nitrate level in that sample.

9 Q What guidance exists regarding the fall soil nitrate test
10 as a tool for nitrogen management?

11 A So there was a bulletin published by Washington State
12 University and Oregon State University about 2002 that's
13 been referred to in the hearing previously.

14 Q And we referred to that as the Cogger and Sullivan?

15 A Cogger and Sullivan publication on fall soil nitrate.

16 Q Could you please pull up Exhibit R-12.

17 A Okay.

18 Q And is this the guidance that you were referring to?

19 A Yes, it is.

20 Q And what was your involvement in developing this
21 guidance?

22 A So in the late 1990s, early 2000s, when I officially had
23 the title livestock nutrient management specialist of
24 Washington State University, got more serious about
25 bringing together teams to work on nutrient management.

1 There had been some concerns over the bulletin that
2 was prior to this one was called a report card test. It
3 seemed to have the -- well, folks were concerned about
4 the lack of guidance in it and in trying to interpret it
5 and really trying to make it a good on-the-field practice
6 guide for producers.

7 So I decided that, well, anytime there's -- that
8 situation arises, the best thing to do is bring everybody
9 together. So brought together the scientists Cogger and
10 Sullivan. Sullivan was in Oregon at that time. Cogger
11 was in Washington State University.

12 Brought together conservation district staff. At
13 that time Barb Carey was doing some work with the
14 Department of Ecology where they were heading fall soil
15 nitrate numbers. We had system of our own from our
16 program.

17 And so we had a two-day workshop in Puyallup
18 basement of a hotel there, and after that two days, there
19 was agreement that there should be a revised bulletin
20 published.

21 And so over the next couple years then, this
22 bulletin was drafted and reviewed and then we came up
23 with the final draft.

24 Q Okay. Is this applicable statewide?

25 A As it was originally written, it's really meant to be

1 used as a Western Washington guide, and that's what it
2 says in the document, so --

3 Q But is it used statewide?

4 A We have seen it used to provide some guidance on the east
5 side, although that wasn't its original intent.

6 Q And for how long and to what extent have producers been
7 using this guidance?

8 A Well, it was published in 2003, so we're going on 15
9 years now.

10 Q And do the producers rely on this guidance?

11 A Yeah. It's used regularly, and particularly there's some
12 management table -- suggested management tables in there,
13 Tables 3 and 4, that are used to help provide adaptive
14 management based on those numbers.

15 Q So what kind of -- what sort of crops does this guidance
16 take into account?

17 A This takes into account both annual crops, which would be
18 corn as well as perennial crops, which would be, as
19 stated in this bulletin, would be grass for silage or
20 grass for hay.

21 Q And is this guidance reflected in Table 3?

22 A Conceptually, I -- I would say it is, but in terms of --
23 there's some distinct differences. One is the absolute
24 numbers, cutoff numbers here are different than are in
25 the fall soil nitrate guidance.

1 The other thing is that the table behind me, Table 3
2 that's in the permit, is a four-level system where it
3 goes to the very high level as well, and the guidance
4 bulletin is a three-level system.

5 Q So the guidance that -- the guidance is different from
6 the permit terms; is that correct?

7 A Yeah. There are differences.

8 Q And this guidance accounts for annual and perennial crops
9 separately, but Table 3 does not.

10 How will that affect producers?

11 A Yeah. So after -- so I provided comments during the
12 drafts of the CAFO permit, but when the final permit came
13 out, I was reviewing it for some reason, and I noticed
14 that -- related to the crops, that it talked about annual
15 crops and particularly in reference to Table 3, but what
16 about perennial crops?

17 And I wasn't seeing anything in there with regard to
18 perennial crops. So I sent off a -- I checked with my --
19 one of my fellow agronomists, soil scientists I work
20 with, Andy Bary, and say, "Andy, check me here. I'm one
21 to jump the gun on this, but it seems to me like there's
22 something missing here."

23 And Andy said, "Yeah. You know, looks like the
24 perennial isn't being considered."

25 So it would -- could leave one to consider that

1 there isn't guidance in -- or isn't -- perennial crops
2 aren't considered as part of the permit, and that leaves
3 confusion for producer, for advisors.

4 If they come back to me and say, "What do we do,"
5 I'm like, "Well, better talk to the agency. I don't
6 know. I didn't write the permit."

7 And so --

8 Q So the terms may or may not be attainable for producers;
9 is that fair?

10 A Yes. That's a fair statement.

11 Q Looking back on Table 3, do you agree that for every
12 field, regardless of what is grown or the time it's grown
13 or where it's grown or what is being grown, that it's
14 ideal to have 15 parts per million of nitrogen?

15 A No. An example of that would be with where we have corn
16 and then after that is triticale is grown.

17 Q And that's a double cropping situation?

18 A Yeah. That would be a double cropping situation. And
19 there's a thumb rule, like 15 part per million, multiply
20 that by 3.5, and you get about 50 pounds of nitrogen.

21 Triticale crop, through its growing season, could
22 easily take up as much as 150 pounds of nitrogen. So if
23 you had 15 part per million nitrogen there, that would
24 not be enough nitrogen for that crop, and you would have
25 to add some additional either manure nitrogen or

1 commercial nitrogen.

2 Q So looking, again, at Table 3, would it ever be desirable
3 to have a high fall soil nitrate test?

4 A So, for instance, again, using the triticale as a double
5 crop following corn as an example, so if we were here at
6 this very high -- the range there is 31 to 45.

7 So if you were around, say 31, 32, multiply that by
8 your thumb rule of 3.5, and you get about 100 pounds of
9 nitrogen.

10 You could still use another 50 pounds of nitrogen to
11 grow that crop, and so it's easy for me to see where you
12 would actually want a high number going into the fall in
13 order to grow that triticale crop.

14 Q So -- and, again, you're describing planting triticale
15 after corn.

16 And is that a common practice on dairy CAFOs
17 throughout the state?

18 A Yeah. Both Eastern and Western Washington.

19 Q So under that scenario where you're growing triticale
20 after corn and you actually want a higher number, you
21 want something in the high range to account for both
22 crops, would the required actions based on trends, which
23 is the third column on Table 3, result in a less
24 productive stand? And could you also define less
25 productive stand?

1 A Yeah. So if you don't have enough nutrients for the
2 crop, it's not going to be as dense. You're not going to
3 get as good a yield. You're not going to get good
4 nutrient uptake.

5 And what we've kind of been talking about, this corn
6 triticale and same with the -- would play out with a
7 grass crop as well. If you don't have enough nitrogen
8 there, you begin to get bare spots. You can get
9 encroaching weeds. The stand doesn't last as long.

10 And we get into the scenario where that grass crop
11 has to be killed out, replowed, reseeded. So you go
12 through this period of the land is not as productive, and
13 you have a chance for nitrate -- nitrate losses, as the
14 Carey report showed.

15 Q So is -- and I'm going to use the term "agronomic
16 application of nutrients." Is that something you can
17 define for us, as you define it?

18 A So agronomic rate -- and I know there's been some
19 discussion about whether that's a good term or not, so in
20 my world with scientists and advisors, we use crop
21 uptake, agronomic rate to be approximately the same
22 terminology.

23 So that would be my description of it.

24 Q Okay. Is an agronomic application of nutrients or
25 application for crop uptake, is that a component of a

1 productive stand --

2 A Yes.

3 Q -- of crop?

4 And is a productive stand more protective of
5 groundwater?

6 A I think so.

7 Q And why?

8 A Well, you've got better control of water infiltration, so
9 that -- particularly because you've got now a very dense
10 root mass. It's going to help create a soil percolation
11 of water. You're going to have more uptake of nutrients
12 because you've got more crop there per unit -- per unit
13 area.

14 Q Have you testified regarding CAFO permits before in this
15 state?

16 A Yes. Eleven years ago. I testified -- I don't think it
17 was this room, but here in Olympia for the last CAFO
18 permit.

19 Q Could I have you look at Exhibit I-60 and tell me what
20 that is? It's going to be in the big book.

21 A Okay. It says it's "Finding of Fact, Conclusions of Law
22 and Order."

23 Q And is that regarding the 2006 matter in which you
24 testified?

25 A Yes.

1 Q And could you turn to Page 36 to 38. And it should be
2 the same number in the PDF.

3 A Okay.

4 Q And does some of your testimony appear in these findings
5 of fact and the conclusions of law?

6 A Yeah. I see my name mentioned there.

7 Q And the 2006 matter, did you testify that groundwater
8 monitoring was not necessary for the CAFO permit to be
9 protective of groundwater?

10 A I did.

11 Q And is that still your opinion?

12 A It is.

13 Q Why?

14 A As has been discussed previously, the Carey report, the
15 study did in cooperation with Department of Ecology.

16 MS. NICHOLSON: And one second. Can
17 we pull up that study. It's R-15.

18 MR. TEBBUTT: Again, I'm going to
19 object. This is beyond the extent of the expert's
20 report.

21 And if we didn't do expert report -- I mean, we did
22 expert reports not so a witness can testify about
23 whatever he wants at the hearing.

24 There's a reason for those, and we're going well
25 beyond the reason for those and outside the relevance and

1 the scope of the expert report.

2 MS. NICHOLSON: This is the findings
3 of fact, conclusions law of the previous CAFO permit in
4 which he had this exact same opinion that he's presenting
5 today.

6 MR. TEBBUTT: Right. And now the
7 industry is trying to sneak in all this stuff through
8 stuff that is outside the scope of the expert report.

9 JUDGE FRANCKS: Okay. The expert
10 reports are not something that's required under our
11 rules, so it's not limiting anyone in this situation.

12 So I'm going to allow him to testify.

13 A Okay. So where's the document? Which book? Sorry.

14 Q (By Ms. Nicholson) That's the Ecology book under R-15.

15 A R-15. Okay. So this is the Carey report that was
16 previously referred to.

17 Q And can you describe your participation in this study?

18 A Yeah. So I was collaborator on this study. Department
19 of Ecology came to WSU, asked if we would be interested
20 in being involved in this study.

21 Gladly agreed. I think it's important to do these
22 long-term studies, in particular. They're so rare, so --
23 and, in particular, as it relates to the question of, do
24 I think groundwater -- or do I think the permit would be
25 protective of groundwater on the abstract, which is

1 Page XI.

2 Okay. So it's a little small for the board to see,
3 but, anyhow, third paragraph talks about -- talking about
4 the average monthly nitrate concentration in the shallow
5 groundwater monitoring wells.

6 They range from about 5 and a half up to about 30,
7 and then there was one well had a maximum of 45.

8 Under Point No. 2 -- so that kind of gives you the
9 global view, but under Point No. 2, with regard to these
10 nitrate concentrations, it says that, "They were
11 generally below the ten milligram per liter when nitrogen
12 loading was similar to crop removal."

13 So, to me, this -- in this abstract, that's in the
14 conclusions or summary statement as well that, when the
15 producer managed their land so that it was at crop
16 removal, the shallow groundwater was below the ten
17 milligram per liter.

18 And something else to understand about this study
19 was, we -- it was really kind of a case study, an
20 evaluation, in that we simply studied what the producer
21 did.

22 We didn't control what he did. We didn't control
23 when he applied his manure, what time of the year, what
24 rate, whether he applied commercial fertilizer, whether
25 he irrigated.

1 Exhibit I-60.

2 JUDGE FRANCKS: I-60 is admitted.

3 (Exhibit No. I-60 admitted.)

4 MS. NICHOLSON: And also I-50, if I
5 didn't do that before.

6 MR. TEBBUTT: I believe, again, I-60
7 is the decision from before, and you already said that
8 that wouldn't be admitted because it's just part of the
9 case.

10 JUDGE FRANCKS: So true. That is not
11 necessary to admit, but --

12 MS. NICHOLSON: Okay. I believe
13 that's it.

14 JUDGE FRANCKS: I did admit I-50,
15 though.

16 Ms. Barney, are you next?

17 MS. BARNEY: I believe so.

18 CROSS-EXAMINATION

19 BY MS. BARNEY:

20 Q Good morning, Dr. Harrison.

21 A Good morning.

22 Q I had a couple questions on the early work that you
23 described to Ms. Nicholson, the work with regard to the
24 anaerobic digester.

25 A Yes.

1 Q You said in that, you used -- you studied the digester at
2 a particular dairy?

3 A Yes.

4 Q And was that just one dairy?

5 A Actually, we had two -- there's two different studies.
6 The one that was funded by the Conservation Innovation
7 Grant program, NRCS, was in Monroe, Washington.

8 And the original intent, that was going to be a
9 community anaerobic digester. When it went online,
10 actually started producing, it was from a single dairy.

11 But previous to that study, we had looked at a
12 community digester in Tillamook, Oregon, and that
13 dairy -- excuse me -- that anaerobic digester was
14 receiving manure from about 12 to 15 dairies in the
15 Tillamook area, where they brought their manure in by
16 truck and went through the digester.

17 And then the liquid stream, after going through
18 anaerobic digestion, then was trucked back to the dairies
19 to be used as fertilizer, so --

20 Q In that Tillamook study, did you examine pathogens in
21 relation to that as well?

22 A Yes, we did.

23 Q How many digesters do you know of that are on dairies in
24 Washington?

25 A I believe the number right now is about eight.

1 Q Okay. So the work on the pathogens, you only looked at
2 material that had already gone through the digester?

3 A No. We actually sampled the manure before it went into
4 the digester. So I'll give you the long answer, if
5 that's okay.

6 Q Sure.

7 A When we got the original grant, the idea was that we're
8 going to have this kind of once-in-a-lifetime
9 opportunity. It was a new digester, and there were about
10 six dairies that were interested in being part of
11 communing their cows' manures to that digester and then
12 receiving the liquid stream back.

13 And the idea was to look at what were the types of
14 bacteria, particularly the pathogenic ones, from a
15 biosecurity standpoint. So if one dairy was pretty clean
16 with all these types of bacteria and didn't want bacteria
17 this other dairy might have, it might be with what we
18 considered a biosecurity concern.

19 So during the early phases of the grant, we actually
20 went on a monthly basis and looked at -- took manure
21 samples from cows on those dairies and looked to see
22 whether they had salmonella, whether they had E. coli,
23 which is the Jack in the Box bacteria that we are so
24 concerned about, and a number of other bacteria.

25 And so we looked at the material before it ever

1 entered the digester. Then at the time that the digester
2 actually came online, only one of those six dairies
3 continued to be involved with providing manure, but we
4 continued to look at the manure stream coming into the
5 digester.

6 In Washington State, digesters are allowed to
7 utilize as much as 30 percent of the feedstocks. The
8 material coming into the digester can be what's called
9 pre-consumer food waste, and that's regulated by the
10 Department of Ecology.

11 So in the case of the digester in Monroe, they take
12 blood from the slaughter plant. They take grease trap
13 waste from restaurants, and then one interesting material
14 they take is with what we call -- well, it's expired
15 beverages, so beers, wines, pop, Starbucks drinks.

16 All those sorts of things can be then -- they have a
17 really high sugar content. They make a lot of methane,
18 so they can -- so we assay each one of those before they
19 went into the digester as well.

20 Q For bacteria or virus or both?

21 A For pathogens, yep. And so we looked at all that. So we
22 actually took samples before it ever went into the
23 digester.

24 Immediately after it came out of the digester, then
25 it went through a liquid solid separation step. So we

1 then took another sample of the liquid after it came
2 across the liquid solid separator.

3 Then when the large particle solids came off in a
4 pile, we sampled those. And then when the material went
5 through a composting, we also assayed post compost.

6 And then the liquid that got stored in the lagoon,
7 we also did some pretty intensive sampling on the
8 material after it had been stored in the lagoon. So it
9 was pretty extensive.

10 Q And I believe what I heard you say was that -- that you
11 did not -- at the close of that study, you had not found
12 any pathogens of concern in the sampling?

13 A From a virus standpoint.

14 Q From a virus standpoint.

15 Did you from a bacterial standpoint?

16 A So depending on the organism, you can get as much as 90
17 to 99 percent kill of the organisms. So in some cases --
18 in some, we would see 100 percent kill.

19 The one organism that was particularly resilient
20 seemed to be a bug called mycobacterium paratuberculosis.
21 It's an organism that affects cattle, and it gives them a
22 wasting disease. They're called Johne's disease, so that
23 one seemed to be particularly resistant.

24 Q So the -- so your understanding is that the digester
25 actually acted to inactivate the bacteria and potentially

1 inactivate viruses?

2 A Yes. Particularly the bacterias, yes.

3 Q So -- but in terms of looking at manure applications or
4 lagoon storage for facilities that aren't using
5 digesters, you've never looked at that from the
6 standpoint of pathogens; correct?

7 A Yes. Actually, we have. So when we did comparisons of
8 the manure -- so another piece that we did, in addition
9 to taking it all the way to storage, was what would
10 happen upon land application.

11 Q But as the result of the digester or just straight land
12 application of manure?

13 A Both.

14 Q Okay.

15 A So we actually ran a three-year study, looking at the
16 nutrient uptake from anaerobically digester manure and
17 non-anaerobically digested manure, and we compared that
18 to control which had nothing, and then we had a positive
19 control, which was urea nitrogen.

20 So when we did those studies, we also looked at
21 reductions in the pathogens, using E. coli as an example,
22 on land application and looked at the die-off curves for
23 those.

24 Q And did you look at pathogens in relation to lagoons
25 specifically, storage lagoons?

1 A Yeah. We actually -- sent staff out in my square stern
2 Coleman canoe, and they flew it to the lagoons and took
3 samples at multiple depths and we looked at -- over a
4 three-month period.

5 Q Within the liquid?

6 A Within the liquid.

7 Q Did you look -- did you ever have the opportunity to look
8 at what may have seeped or escaped underneath the lagoon?

9 A So we looked at three different depths, so --

10 Q But still within the lagoon itself; correct?

11 A Within the lagoon, correct.

12 Q Okay.

13 A I have not been involved in any samples taken below the
14 bottom of the lagoon.

15 Q Okay. Thank you.

16 Could I ask you to look at I-51, please.

17 A Okay.

18 Q Is this the study you just described to us with that
19 application in the urea control?

20 A Yes.

21 Q Could I ask you to look at Page 7 of the document,
22 please.

23 A Okay.

24 Q So looking at Table 8 in this document, can you tell us
25 what this table contains for values?

1 A This table summarizes the soil nitrate in the top foot
2 over a three-year period of time.

3 Q And the sample dates there, going down the left-hand
4 column?

5 A Yes. So we started in May of 2009, and it goes through
6 November of 2011.

7 Q Okay. If we can just sort of look at 2010 for the
8 moment, looking at the first sample date, the 26th of
9 February --

10 A Mm-hm.

11 Q -- those soil nitrate values are in the area of 12, 11,
12 15, 15, 13, and 14 there, going across?

13 A Correct.

14 Q For all the various applications?

15 A Correct.

16 Q Is that -- is that number significant with regard to
17 someone who's trying to plan a nutrient budget for their
18 facility for the year?

19 A Significant, so should they consider them? Would that be
20 the --

21 Q Yes.

22 A Typically, we don't.

23 Q And why not?

24 A Because the numbers are low enough that they don't
25 provide that much nitrogen for the crop and because the

1 time of the year they're taken. So in February --

2 Q So you had mentioned spring soil sampling before in that
3 in Washington that can be as early as February; correct?

4 A Well, I said that spring sampling could be as early as
5 February, but my position has been that a spring sample
6 in Western Washington is really of little value for
7 making nutrient application decisions.

8 Q And the reason for your opinion on that is?

9 A We have lots of rain over the winter, and that -- it
10 just -- the amount of nitrate that's in there in the soil
11 in the early part of the year is minimal.

12 Q So -- but these values, in reading this study, there
13 are -- the values just above that, the 30th of November,
14 there were no nutrients applied to these fields between
15 the 30th of November and the sample date of the 26th, and
16 yet there seems to be still quite a bit of nitrate
17 remaining in the field from the --

18 A Right. So I don't know whether the -- there's
19 temperature data in this or not, but the other thing
20 that's occurring at that point in time, and particularly
21 for us in Western Washington, is the crop is actually
22 growing, and if the crop is growing, you've also got all
23 the microbial actions going on.

24 So if one is trying to go from 30th of November on
25 11 or a 12 -- yeah, so ten to twelve and then looking at

1 numbers that go from about 11 to 15, and that four part
2 per million increase, I'm concluding that that's a result
3 of the bacterial action on the organic nitrogen there
4 actually producing some nitrate, which then can be taken
5 up by the crop.

6 Q Mm-hm. So -- but having nitrates still existing there,
7 then it's not all washing away through soil; right?

8 A No.

9 Q So there is still some to be considered if one was going
10 to put together a nutrient budget?

11 A You could.

12 Q Might be small?

13 A It would be small, but you could.

14 Q Yeah. Okay.

15 A Math could be done.

16 Q Math could be done.

17 A Excel spreadsheets do wonders.

18 Q So if I could get you to turn -- I'm sorry. I'm going to
19 make you switch books back to R-2, the permit.

20 A Okay.

21 Q On Page -- let's see. Yeah. Page 21, which would be the
22 same on the PDF.

23 A Okay.

24 Q So did you see the bottom of Page 21 there, Section 4,
25 where it says, "Double Cropping, Winter Cover Crops, and

1 Perennial Crops"?

2 A Yeah.

3 Q That bottom section there?

4 A Yeah. Actually, it's towards the top, but I want to make
5 sure we're at the same place. Section 4. Right?

6 Q Yep. That's the one.

7 A Okay. Gotcha.

8 Q And it's -- in reading this condition of the permit, it
9 talks about land applications taking place after fall
10 soil sampling must be demonstrated to be necessary with
11 regard to the amount of nutrients that may be added.

12 So what it says in the second paragraph where it
13 starts, "Before land application may take place for a
14 double crop, winter crop -- cover crop or perennial crop,
15 the permittee must have taken fall soil samples, have had
16 the soil samples analyzed, and developed a second yearly
17 field nutrient budget."

18 A I see that.

19 Q Does that seem to address your concerns that the permit
20 does not permit the use of double cropping or perennial
21 crops?

22 A In conjunction with Table 3, it does help.

23 Q Mm-hm. Because your earlier testimony seemed to indicate
24 that you didn't think the permit accommodated.

25 A If you look at Table 3 only, it could lead one to believe

1 that it's fairly restrictive or -- and I guess the other
2 thing is that, you know, when we have the term "high,"
3 usually indicates bad.

4 Q Mm-hm.

5 A And it might be okay, and I think that's why the language
6 in the fall soil nitrate bulletin stayed away from terms
7 like low, medium, high, very high, and that they're just
8 management categories.

9 Q Well, and that's what these are, correct, just management
10 categories?

11 A Correct.

12 Q Because it doesn't -- you know, under certain management
13 categories and conditions, certain things have to happen?

14 A And I think I've heard them mentioned as targets before,
15 yeah.

16 Q Okay. Thank you.

17 Could I ask you to take a look at -- let's see --
18 I-45, please.

19 A Okay.

20 Q So do you recognize this document?

21 A Yeah. So it's an email from me to John Jennings, copied
22 to Andy Bary, Dan Wood, and WSDF.

23 Q And it appears to have some attachments, and the body of
24 the email says, "Attached comments on the current draft
25 version of the CAFO permit"?

1 A Yes.

2 Q And the date there, July 2016?

3 A Yep.

4 Q Could you please turn to Page 12. In our PDF it's
5 Page 12. I know the -- you go past the paper that we
6 just discussed.

7 A Yeah.

8 Q And then here's where I think actually your comments
9 begin.

10 A Okay.

11 Q So down toward the bottom of the page there where you're
12 commenting, I believe, on Page 20 and Section F -- and
13 I'll just go ahead and read that -- "When crop nutrient
14 utilization has stopped or is limited, e.g., no
15 application to perennial grass crops before spring
16 green-up. The term 'spring green-up' leaves a lot of
17 room for interpretation and suggest changing to the use
18 of T-sum 200 concept of applying manure when sufficient
19 heating has occurred."

20 Can you tell us what T-sum 200 is?

21 A T-sum 200 is the sum of temperature that would --
22 starting January 1 of each year, that would be
23 productively used for crop growth.

24 Q Was that what you were talking about when we were talking
25 about spring samples a moment ago, where the crop was

1 beginning to grow, maybe the green-up idea and you were
2 saying that the temperature in the soil --

3 A Yeah. That would be -- yes.

4 Q Okay. And is it your understanding that the permit now
5 does include T-sum 200 as a -- as a tool?

6 A Yes.

7 Q With regard to --

8 A Yes.

9 Q -- nitrogen application?

10 MS. BARNEY: Thank you. That's all I
11 have.

12 JUDGE FRANCKS: Okay. Mr. Tebbutt?

13 MS. BARNEY: Oh, Your Honor, I'm
14 sorry. I neglected to move to enter Exhibits I-51 and
15 I-45.

16 JUDGE FRANCKS: Okay. I-51 and I-45
17 are admitted.

18 (Exhibit Nos. I-51 and I-45
19 admitted.)

20 MS. BARNEY: Thank you.

21 JUDGE FRANCKS: Mr. Tebbutt.

22 CROSS-EXAMINATION

23 BY MR. TEBBUTT:

24 Q Good morning, Dr. Harrison.

25 A Good morning.

1 Q I think I was the one who took your testimony about 12
2 years ago in front of this agency; correct?

3 A I think that's correct.

4 Q Actually, didn't take your testimony. I cross-examined
5 you; right?

6 A Correct.

7 Q Now you're a public employee; right?

8 A Pardon?

9 Q You're a public employee?

10 A Yes.

11 Q And you're here on the public taxpayers' dollar; correct?

12 A Yes.

13 Q And you've been an agent of the Washington State Dairy
14 Federation for about 33 years; correct?

15 MS. NICHOLSON: Objection.

16 Terminology is incorrect. Assuming facts not in
17 evidence.

18 MR. TEBBUTT: It's a valid question.

19 JUDGE FRANCKS: All right. I'm going
20 to allow it.

21 A I don't understand the question.

22 Q (By Mr. Tebbutt) You've been representing the dairy
23 federation for 33 years, or 35 years now, I think, as you
24 testified today in your work as a public employee;
25 correct?

1 MS. NICHOLSON: Objection. That
2 misstates testimony.

3 JUDGE FRANCKS: Can you rephrase the
4 question?

5 Q (By Mr. Tebbutt) How many meetings of the dairy
6 federation have you attended in your time as a public
7 servant?

8 A So thinking back to my deposition, I think I -- over a
9 period of 20 years, I think I came up with a number,
10 something like 80.

11 Q It's actually 33 years; right?

12 A Well, I didn't attend their meetings for the first
13 portion of my career because it was another faculty
14 member that served that role.

15 Q Okay. So you do -- you've done it for the last 20 years
16 at about five times a year?

17 A Approximately.

18 Q So about 100 meetings of the dairy federation, right, on
19 their behalf?

20 A Incorrect.

21 Q Incorrect?

22 A Mm-hm.

23 Q What's incorrect about it?

24 A My role is a liaison between Washington State University,
25 particularly college of agriculture, home and economics,

1 economic resources.

2 So it's to serve as a liaison role between the
3 university and the dairy industry specifically as it
4 relates to this meeting of the dairy federation.

5 Q So it's not then to be an expert witness on behalf of the
6 dairy federation for nothing; right?

7 MS. NICHOLSON: Objection.
8 Argumentative.

9 JUDGE FRANCK: I'm going to sustain
10 that.

11 Q (By Mr. Tebbutt) So you do your work for nothing for the
12 dairy federation?

13 MS. NICHOLSON: Objection.
14 Argumentative.

15 JUDGE FRANCK: I'm going to sustain
16 that.

17 Q (By Mr. Tebbutt) You don't charge the dairy federation
18 for any of the work that you do for them; correct?

19 MS. NICHOLSON: Objection. That
20 misstates his testimony.

21 JUDGE FRANCK: I'm going to allow him
22 to answer that question.

23 A Question again, please.

24 MR. TEBBUTT: Would the court reporter
25 please read it back so Mr. Harrison can actually answer a

1 question.

2 (Question on Page 1176, Lines
3 17 through 18, read by the
4 reporter.)

5 A Correct. They fund research.

6 Q (By Mr. Tebbutt) That's all I asked. Just correct or
7 not correct.

8 And they do fund your research too, right,
9 oftentimes?

10 A First question was, do they fund it? Yes. Oftentimes?
11 No.

12 Q Sir, you're not a soil scientist by education; correct?

13 A Correct.

14 Q You're not a hydrogeologist?

15 A Correct.

16 Q You're not an agronomist?

17 A Correct.

18 Q You're not an economist?

19 A Correct.

20 Q Let's take a look at R-15, please. Take a look at the
21 PDF Page 13.

22 Do you have that in front of you, sir?

23 A Getting there. Hang on. Okay.

24 Q Would you read the very last paragraph?

25 Well, let me ask you: You're a coauthor of this

1 study; correct?

2 A Correct.

3 Q Okay. Read the very last paragraph on that page, please.

4 A "Model results based on measured field parameters
5 indicate an average of 115 pounds breaker of nitrate
6 leached to groundwater from September through March. Two
7 methods for estimating the nitrogen residual at the end
8 of the growing season, mass balance analysis and post
9 harvest soil nitrate testing, were not reliable
10 predictors of nitrate concentrations in groundwater.
11 Direct monitoring of water quality at the water table was
12 the only accurate and reliable method for tracking
13 effects of manure management on groundwater nitrate."

14 Q Thank you.

15 Now let's take a look at A-59.

16 A So which book is that in?

17 Q It's in the A book, which is ours, the white cover, the
18 large --

19 A Okay.

20 Q You have that in front of you?

21 A Yes.

22 Q And that's PowerPoint that was done, extracting
23 information from R-14 -- R-15, sorry, that you were
24 coauthor of; correct?

25 A Correct.

1 Q Let's take a look at Page 9 of A-59. You have that in
2 front of you? The page entitled "Results," A-59, Page 9.

3 A Yep. Got it.

4 Q See that in the bottom right? Should have the label.

5 A Yeah.

6 Q Read the first two bullet points, please.

7 A "Groundwater nitrate concentration highest first winter.
8 Maximum of 45 after high manure nitrogen line."

9 Q Okay. Read the second one, please.

10 A "Groundwater nitrate decreased with lower nutrient manure
11 nitrogen loading below the MCL 2006 to 2007."

12 Q Right. So when you apply 45 parts per million, the
13 results indicate that if you apply 45 parts per million
14 of nitrogen, that you get high nitrate concentrations in
15 groundwater; correct?

16 MS. NICHOLSON: Objection. Assumes
17 facts not in evidence.

18 A That's incorrect. That's not what it says.

19 Q (By Mr. Tebbutt) All right. Let's take a look at the
20 next page, Page 10.

21 A Okay.

22 Q There are two methods for estimating manure nitrogen
23 loading effects on groundwater ; right?

24 A That's what this page summarizes.

25 Q Right. And the first one says, N mass balance inputs

1 minus outputs equals excess N to groundwater; correct?

2 A That's -- agree with what's written there.

3 Q Right. So that's what you're talking about when you say
4 that groundwater -- or nitrates at the end of the
5 application season flush to groundwater over the course
6 of the winter; correct?

7 MS. NICHOLSON: Objection. That
8 misstates testimony.

9 JUDGE FRANCKS: Can you rephrase?

10 Q (By Mr. Tebbutt) Earlier you talked about nitrate being
11 lost to groundwater over the course of the winter;
12 correct?

13 A Yes.

14 Q And this is the equation that shows how much nitrate goes
15 to groundwater; right?

16 A No.

17 Q No? What does excess N to groundwater mean there then?

18 A Potential movement to groundwater.

19 Q Okay. Take a look at Page 12 of A-59.

20 A Same document?

21 Q Yeah. Same document.

22 A Okay.

23 Q Do you have that Page 12 in front of you?

24 A I do.

25 Q And would you read the second bullet point, please.

1 A "Soil dynamic system, high variability, high recharge
2 over the fall/winter, post-harvest soil nitrate test
3 inherently estimate the amount" --

4 Q Sir, do what? Soil inherently what?

5 A "Underestimate the amount of leaching to groundwater,
6 Kowalenko 1987 and Kuipers 2014."

7 Q Right. And then take a look at Page 16 of A-59.

8 A Okay.

9 Q So this study talked about how much nitrate leached to
10 groundwater during fall/winter period; right? That's the
11 first bullet point?

12 A It was some modeling work that they did.

13 Q It wasn't actual monitoring -- groundwater monitoring?

14 A This particular page refers to modeling work they did.

15 Q But that was based on actual groundwater monitoring too;
16 right?

17 MS. NICHOLSON: Objection. Please
18 allow him to finish the question -- his answer.

19 JUDGE FRANCKS: Were you finished with
20 your answer to the last one?

21 A Not sure.

22 Q (By Mr. Tebbutt) Let me just ask the question again.

23 A Okay.

24 Q This first bullet point, what you're discussing here --
25 you're talking about the modeling -- it actually included

1 actual groundwater monitoring; correct?

2 A Yeah. It was actually Barb Carey that was actually
3 discussing this.

4 Q That was not my question. My question was: Did it
5 include groundwater monitoring?

6 Answer the question, please.

7 A Yes.

8 Q And 40 percent of the leaching occurred after the fall
9 flush; right?

10 A The model predicted that.

11 Q Right. So let's take a look at page A-17, please -- or
12 A-59, Page 17. Same document. The second bullet point
13 talks about only sample the top foot.

14 So if you don't -- you see that there?

15 A Yes.

16 Q And so if you only sample the top foot, you don't know
17 what's going on in the second and third and fourth foot,
18 right, in terms of nitrate movement?

19 A If you only measure the top foot, that's all you know.

20 Q Right. But the nitrate -- you agree that the nitrate
21 moves with the water down into the -- towards the
22 groundwater; correct?

23 A It can.

24 Q It's more likely than not that it does; correct?

25 A No.

1 Q It's not more likely than not that it does.

2 So what else could stop it? Uptake by plants?

3 A Uptake by plants, correct.

4 Q And that's the only thing that would stop it; right?

5 A No.

6 Q Under normal conditions?

7 A No.

8 Q What else would stop it?

9 A You can actually have soil conditions or the chemistry in
10 the soil particularly as it relates to iron compounds
11 which can hold the nitrate at levels within the soil
12 profile.

13 Q Have you seen that in the state of Washington very much?

14 A I have seen long ditch lines where you'll see a lot of
15 iron contribution to drainage in the ditch, so, yeah,
16 it's evident that happens in Washington.

17 Q Can you point to any studies that show that? Can't, can
18 you?

19 MS. NICHOLSON: Objection. He's not
20 allowing him to even answer the question.

21 JUDGE FRANCK: I'm going to sustain
22 that.

23 Q (By Mr. Tebbutt) Let me rephrase it.

24 You can't point to any studies in the state of
25 Washington that show that condition as taking out the

1 nitrate in the water -- in the soil column, can you?

2 A Not that I can recollect.

3 Q Right. Take a look at Page 18, please.

4 A Okay.

5 Q Read the last three bullet points, please.

6 A "Applying manure too late in the season resulted in
7 groundwater nitrate increases."

8 Q That's first one. Read the second one, please.

9 A "Nitrate continued to leach in the late winter/early
10 spring."

11 Q Okay. Third one?

12 A And "Groundwater monitoring was the only reliable way to
13 assess nitrate impacts."

14 Q Okay. Let's take a look at Page 19, please, of A-59. In
15 the acknowledgments, you said the Lynden, Washington,
16 dairy producer/landowner contributed their place for this
17 work?

18 A Correct.

19 Q Who was that?

20 A Larry DeHaan.

21 Q And where is that facility in Lynden?

22 A It's northwest of Lynden.

23 MR. TEBBUTT: Yeah. Move to admit
24 A-59.

25 JUDGE FRANCKS: A-59 is admitted.

1 (Exhibit No. A-59 admitted.)

2 Q (By Mr. Tebbutt) Let's take a look at R-12, please.

3 This is the Sullivan and Cogger study that's been talked
4 about quite a bit in this hearing; correct?

5 A Yeah. It's not a study, but, yes, it's a Sullivan/Cogger
6 guidance bulletin.

7 Q Okay. Let me just back up for a minute.

8 Sir, you've been present for all of this hearing;
9 correct?

10 A Except for the first day.

11 Q Okay. And, again, you're being paid by the taxpayers to
12 be here; correct?

13 MS. NICHOLSON: Objection.
14 Argumentative.

15 JUDGE FRANCKS: I'm going to sustain
16 that.

17 MR. TEBBUTT: I guess we've already
18 established it already.

19 Q (By Mr. Tebbutt) Take a look at Page 3 of R-12, please.

20 A Okay.

21 Q And specifically this page discusses the continued
22 mineralization can provide enough plant available and for
23 a crop; correct?

24 MS. NICHOLSON: Objection. Vague.

25 JUDGE FRANCKS: I'm going to overrule

1 that, but I would like to know where it says that.

2 A Yeah.

3 Q (By Mr. Tebbutt) It's where -- on the --

4 A Left column? Right column?

5 Q Right column under "how not to use" -- the first bullet
6 point, "So continued mineralization" -- you see there --
7 "of nitrogen conversion of organic end forms to plant
8 available end forms in the soil can provide enough
9 plant-available nitrogen for a crop without accumulation
10 of nitrate end in the soil."

11 Do you see that?

12 A I do.

13 Q You don't disagree with that statement, do you?

14 A No.

15 Q Let's take a look at Page 7. And this says, "Even
16 where" -- looking at the "if post harvest nitrate end is
17 20 to 45 parts per million part."

18 Do you see that?

19 A The upper part, yes.

20 Q It says, "When residuals post harvest nitrate is that you
21 should still plan to reduce manure application by 10 to
22 25 percent"; correct?

23 A That's what it says, yes.

24 Q Yeah. So this study deals, again, more with plant issues
25 than groundwater contamination; right?

1 A Yeah. The context of this bulletin was from an agronomic
2 standpoint for crop growth, correct.

3 Q Right. It's not about protection of groundwater, is it?

4 A I think, in the beginning of the bulletin, they address
5 the -- it's not meant to be a regulatory document.

6 Q Okay. Sir, can't too much nitrogen in a forage crop
7 actually hurt the animals?

8 A Yes.

9 Q And that's discussed on Page 14 of R-12, isn't it? If we
10 could go to Page 14, very last bolded paragraph.

11 A Correct.

12 Q Let me ask you about triticale.

13 After you harvest corn and planting triticale on the
14 east side --

15 A Okay.

16 Q -- how far down does the triticale root system establish
17 itself in the fall in that first planting?

18 A Well, it's only planted once.

19 Q Right.

20 A Exact root depth, I can't give you an exact number.

21 Q Less than a foot, though, isn't it, when it's established
22 in the fall?

23 A I can't give you an exact number.

24 Q Haven't you ever looked at it?

25 MS. NICHOLSON: Objection.

1 Argumentative.

2 JUDGE FRANCKS: I'll allow it.

3 Q (By Mr. Tebbutt) It's a simple question.

4 A In Eastern Washington, no, I haven't.

5 Q So you don't know how deep the roots are on it; right?

6 A I don't have an exact number.

7 Q And if nitrate goes below the root zone, it's destined to
8 go to groundwater, more likely than not, right, in
9 Eastern Washington?

10 MS. NICHOLSON: Objection. Misstates
11 testimony.

12 JUDGE FRANCKS: I'm going to allow him
13 to answer it.

14 A No.

15 Q (By Mr. Tebbutt) Can you answer the question, please?

16 A I did.

17 Q I'm sorry. What was your answer?

18 A No.

19 Q No. Where does it go? Just sits there?

20 A It can.

21 Q But if there is more irrigation practices, that water
22 will move the nitrate to groundwater, won't it?

23 A Producers aren't irrigating over the winter.

24 Q Okay. Precipitation will move that nitrate down to
25 groundwater, won't it?

1 A It may move the nitrate.

2 Q More likely than not that it will, isn't it?

3 A No.

4 Q Really? In your opinion -- you've heard Mr. Erickson
5 testify about that; correct?

6 A Yes.

7 Q And you disagree with his testimony about that?

8 A Yes.

9 Q And so you didn't get out and study the soils in Eastern
10 Washington at any of the dairies, did you?

11 MS. NICHOLSON: Objection. Misstates
12 testimony.

13 A Done a case study with one of the dairies in Eastern
14 Washington that relates to their manure cropping
15 practices in a corn and triticale production system and
16 produced a video with interviews of their consultants,
17 fertilizer consultants, as well as the producer and his
18 land application people.

19 So from that standpoint, I have studied it. I
20 didn't actually take the samples myself. But in the
21 context of producing our professional video, yes, we did
22 evaluate it.

23 Q (By Mr. Tebbutt) Was that for the GWMA?

24 A Was that for the GWMA? No. It was actually a part of
25 climate change research project.

1 Q And when was that done?

2 A I believe two summers ago.

3 Q Were those results submitted to the GWMA?

4 A No.

5 Q Did it show nitrogen below the one-foot significant or --

6 A I'd have to go back and look at the video to --

7 Q How did you do the test?

8 A Again, I can't answer that specifically today.

9 Q But none of that is mentioned in your expert report;
10 right?

11 A No.

12 MR. TEBBUTT: Your Honor, would this
13 be a good time for a break? I have a few more questions.

14 JUDGE FRANCKS: It is a good time for
15 a break. Let's take a ten-minute break. We'll be back
16 at 10:46.

17 (Pause in the proceedings.)

18 JUDGE FRANCKS: Have a seat. Let's go
19 back on the record.

20 Mr. Tebbutt -- oh, we need a witness, don't we?

21 MR. TEBBUTT: Well, I don't know. In
22 this particular case, I'm not sure.

23 MS. NICHOLSON: He's in the restroom,
24 Your Honor.

25 JUDGE FRANCKS: It's okay. He's been

1 in the hot seat for a while.

2 Let's go back on the record. Mr. Tebbutt.

3 CROSS-EXAMINATION (Continuing)

4 BY MR. TEBBUTT:

5 Q Yes. I have a few more questions, Dr. Harrison.

6 A Okay.

7 Q You testified about 1998 Dairy Nutrient Management Act
8 earlier in your questioning from your lawyer; right?

9 A Correct.

10 Q And so you were involved in that on behalf of the dairy
11 federation?

12 A No.

13 Q Why were you testifying about it then?

14 MS. NICHOLSON: Objection.

15 Argumentative.

16 JUDGE FRANCKS: I'll let him answer.

17 A To provide an understanding of the current conditions for
18 all dairies in the state with regard to conditions that
19 are fairly similar to what's in the proposed permit.

20 Q (By Mr. Tebbutt) Didn't, in fact, the industry run to
21 the legislature to propose the Dairy Nutrient Management
22 Act to cover their tracks when CARE sued a bunch of the
23 dairies in 1997 and 1998?

24 MS. HOWARD: Objection.

25 Argumentative.

1 A I don't know.

2 JUDGE FRANCKS: I'm going to allow him
3 to answer.

4 A I don't know.

5 Q (By Mr. Tebbutt) Okay. So what methods are there for
6 tracking effects of manure management of groundwater?

7 A Not sure I understand the question.

8 Q All right. Let me ask it again. What methods are there
9 for tracking effects of manure management on a
10 groundwater nitrate impacts?

11 A If a person is interested in actually looking at
12 groundwater nitrate, one has to sample groundwater.

13 Q Right. That's the only way to know; right?

14 A It's the only way to know what the nitrate is in
15 groundwater is to actually sample the groundwater and
16 have it assayed.

17 Q You were asked some questions about I-49, which was your
18 little graphic about the nitrogen cycle; right?

19 A Correct.

20 Q And you pointed out in the testimony that you missed the
21 leaching to groundwater as part of that; right?

22 A I indicated there was an arrow that should be in the
23 drawing to indicate movement of nitrate.

24 Q Right. And so you left that out intentionally because
25 you didn't want to show the flushing to groundwater, did

1 you?

2 MS. NICHOLSON: Objection.

3 Argumentative.

4 JUDGE FRANCKS: I'm going to sustain
5 that one.

6 Q (By Mr. Tebbutt) Did you leave it out intentionally?

7 A Nope.

8 Q The Baram study actually showed that the dairy was
9 contaminating the aquifer, didn't it?

10 A That's my understanding.

11 Q Sir, if tile drains are present in a field, don't they
12 provide a direct conduit for manure to be discharged to
13 surface waters?

14 MS. NICHOLSON: Objection. This is
15 outside of the direct testimony.

16 JUDGE FRANCKS: I'm going to sustain
17 that. We didn't talk about tile drains.

18 MR. TEBBUTT: Well, he talked about
19 everything that wasn't in his expert report. Surface
20 well, monitoring.

21 JUDGE FRANCKS: He didn't talk about
22 tile drains.

23 Q (By Mr. Tebbutt) Did you talk anything about surface
24 water monitoring in your direct?

25 MS. NICHOLSON: Objection.

1 Argumentative.

2 JUDGE FRANCKS: I'm going to sustain
3 that too.

4 Q (By Mr. Tebbutt) Are there multiple ways that dairy can
5 contaminate the environment? Correct?

6 MS. NICHOLSON: Objection.
7 Argumentative.

8 JUDGE FRANCKS: I'm going to allow him
9 to answer.

10 A Correct.

11 Q (By Mr. Tebbutt) And one way would be through surface
12 water discharges; correct?

13 MS. NICHOLSON: Again, Your Honor,
14 this is outside the scope of direct.

15 A That's what the CAFO permit is about.

16 JUDGE FRANCKS: I'm going to allow it.

17 Q (By Mr. Tebbutt) And so if you overapply manure to soil,
18 it could run off to surface water through either sheet
19 flow or through percolation down to groundwater that's
20 hydrologically connected to surface water; correct?

21 A The possibility exists.

22 Q And one of those ways would be through tile drains;
23 correct?

24 MS. NICHOLSON: Objection, Your Honor.
25 Getting back outside the scope of the direct testimony

1 again.

2 JUDGE FRANCKS: I'm going to sustain
3 that.

4 Q (By Mr. Tebbutt) Sir, you've done a lot of work to study
5 the impacts of manure management with regard to dairies;
6 correct?

7 A Correct.

8 Q You've done any studies on the impact of nitrate
9 contamination on people, using taxpayer dollars?

10 A Not that I remember.

11 Q I didn't think so.

12 JUDGE FRANCKS: Redirect?

13 MS. NICHOLSON: Yes. I just have a
14 few things, Dr. Harrison.

15 REDIRECT EXAMINATION

16 BY MS. NICHOLSON:

17 Q Could we -- can we start with Exhibit R-12. And I
18 believe that counsel for Puget Soundkeeper directed you
19 to Page 3.

20 A Okay.

21 Q And on that page, he asked you to read a paragraph, I
22 believe, under what the test will not do.

23 Do you recall that?

24 A Yes.

25 Q And it says that, "The continual mineralization could

1 provide enough plant available nitrogen for a crop."

2 Isn't that what it says?

3 A Correct.

4 Q Wouldn't that be entirely dependent on the crop you were
5 growing?

6 A Yes, it would. So different crops would require
7 different amounts of nitrate nitrogen.

8 Q Can I have you turn to -- turn to A-59, please.

9 A Okay.

10 Q Can you tell me what this is?

11 A This was a PowerPoint. It was developed by Barb Carey
12 from the Department of Ecology for presentations she made
13 at the groundwater protection council annual forum in
14 Seattle in October of 2014.

15 Q And did you also present at that forum?

16 A No. I was not an attendee.

17 Q And did you draft this presentation?

18 A No. My name is on it. And that's common courtesy in a
19 professional situation like this, to recognize those that
20 are involved.

21 Q And do you agree with all the conclusions that you see
22 reflected in this PowerPoint?

23 A Not necessarily.

24 Q And let me -- one second here. I believe counsel
25 directed you to Page 9 of the -- and do you recall being

1 directed to this page?

2 A Yes.

3 Q And he asked you about application of 45 parts per
4 million?

5 A Right.

6 Q Was there any application of 45 parts per million?

7 A Yeah, the reference of 45 has to do with the groundwater.
8 It doesn't refer to the application rate of manure.

9 Q So was -- so, to your knowledge, there was no application
10 of manure at 45 parts per million?

11 A Yeah, I'd have to go back through and look at the data to
12 see exactly what the -- what the level was, but the max
13 45 refers to groundwater.

14 Q Okay.

15 A I think the other thing that's important to understand
16 about this presentation is that one of the interests on
17 the part of Department of Ecology was to do modeling work
18 to try to take portions of data from the study and see
19 how predictive it was. These studies are really
20 expensive to run, and particularly if you look over many
21 years of time.

22 And so, you know, one of the conclusions comes from
23 this, we weren't able to predict while there was a lot
24 data collected and it was over a significant amount of
25 time, it would take a much more robust experiment where

1 you had very controlled application rates over multiple
2 fields and replicants to really get a robust model to
3 really be able to protect that groundwater nitrate.

4 So I think that that has a lot to do with
5 conclusions that Barb was making in this particular
6 presentation.

7 Q So it's more of a modeling question than a --

8 A This presentation definitely was in the context of
9 modeling.

10 Q Okay. And, again, that was a study that was not
11 controlled. You were just recording the effects of this
12 study?

13 A Correct.

14 Q Okay. I can get you to turn to Page 12. I believe
15 counsel had you read the second bullet point over in the
16 box to the right of the graph.

17 A Yes.

18 Q Do you agree with that second bullet point?

19 A In the context of the modeling work, it's -- it would be
20 a true statement.

21 And then she gives references to a couple other
22 authors, both out of, I think, British Columbia. I know
23 Kowalenko is for sure.

24 Q So that's only in context of the modeling part of the
25 study; is that correct?

1 A That's my understanding.

2 Q Okay. But do you necessarily know what conclusions Barb
3 Carey was coming to in this PowerPoint? Did you discuss
4 it with her at all?

5 A Not ahead of time, no.

6 Q And do you agree with all the take-home messages that are
7 shown on Page 18?

8 A Okay. So, again, in the context I -- of the modeling, in
9 realizing it's a small portion of the overall data,
10 Bullet Point No. 1, again, limited data within the
11 allowed field nitrogen mass balance to correlate,
12 intensive soil nitrate data, higher availability test
13 leaching.

14 There were times where I guess it was a crop uptake
15 data that actually was able to correlate but not
16 necessarily the intensive nitrate data.

17 The model, again, we talked about how it didn't
18 work.

19 Bullet Point No. 2, 3, 5, 6, "applied manure too
20 late in the season resulting in groundwater" -- that, I
21 definitely agree with. Clearly show that one of the
22 lessons learned.

23 We did continue to see nitrate leach in the late
24 winter, early spring. That was evident in the
25 groundwater -- shallow groundwater sampling, not the deep

1 water.

2 And, again, in the context of, if you're going to
3 look at groundwater and you want to know what the nitrate
4 content is, the only way you can know it is to sample it.

5 So couple of bullet points, I do; the other ones, I
6 qualify.

7 Q I'm sorry. I missed what you just said.

8 A A couple of bullet points I agree with, but many of them,
9 I would have to qualify a disagreement.

10 Q And back to the study, which you did help author?

11 A Correct.

12 Q That reflects your actual opinions?

13 A Yes.

14 Q Regarding this data?

15 A Yes.

16 Q I want to ask you a little bit about your background.

17 You testified that you're not an agronomist by
18 training.

19 Are you an agronomist by experience?

20 A So I've had to learn a lot about agronomy, soils, a lot
21 of other aspects. And I do that in working with
22 colleagues that are trained in those areas, so we tend to
23 work as teams.

24 So I picked up a lot of, I guess, on-the-job
25 training, and I've gone to agronomy meetings as a part of

1 my professional attendance at national meetings as well.

2 Q And I believe you testified earlier this morning that you
3 work with research teams with other professionals?

4 A Correct.

5 Q And one of those areas is agronomy? One of those areas
6 are --

7 A Agronomy and soils in particular and then agricultural
8 engineers.

9 Q And so you work as a team to come up with practical
10 solutions; is that correct?

11 A Correct.

12 Q So back to Table 3, just very quickly --

13 A Okay.

14 Q -- does this table reflect normal nitrogen when double
15 cropping -- in other words, if you are double cropping in
16 the state of Washington?

17 A Right.

18 Q Does this table reflect what you would need to do for
19 double cropping?

20 MR. TEBBUTT: Objection. Leading.

21 JUDGE FRANCKS: Can you rephrase?

22 MS. NICHOLSON: I will try.

23 A So -- I'll wait for you to rephrase.

24 Q (By Ms. Nicholson) Yeah. Wait for me rephrase because
25 I'm going to try that again.

1 What I'm trying to get at is, this table reflects
2 what is necessary actions to take when you get a certain
3 fall soil nitrate test parts per million; is that
4 correct?

5 MR. TEBBUTT: Objection. Leading.

6 JUDGE FRANCKS: I'm going to allow it.

7 A That's my understanding.

8 Q (By Ms. Nicholson) And is the required actions that you
9 were required to take based on that fall soil nitrate,
10 does it reflect the different cropping methods of double
11 cropping or using the cover crop?

12 A In the table, it's not clear. I guess if under the
13 second bullet point -- let me see here.

14 And that's the part that I guess I've always been
15 concerned about permit language is that it's sometimes
16 difficult to know where you are.

17 So I guess here where it says, "Hire a professional
18 consult to develop a yearly budgets and application
19 rates," one might -- and if you take into consideration
20 other pieces of the permit.

21 But as a standalone table, if this is the driver of
22 your actions, it's not clear to me that you have the
23 leeway to go ahead and build those second budgets and
24 take into consideration that second crop.

25 Q And if it's not clear to you --

1 MR. TEBBUTT: Your Honor, I'm going to
2 object. This is outside the scope of the cross.

3 MS. NICHOLSON: No, it's not. That's
4 incorrect. Ecology brought this up, Your Honor.

5 JUDGE FRANCKS: Okay. I'm going to
6 allow it.

7 Q (By Ms. Nicholson) So if Table 3 is what directs your
8 actions, what is the impact to producers of trying to
9 follow this Table 3?

10 A Well, if the -- if you had to use this as a standalone to
11 redirect -- or to make adaptive management, for instance,
12 we discussed the fact these little nitrates would be
13 reasonable to be used for crop triticale production or it
14 would be reasonable that those kind of levels would be
15 appropriate for grass fields at that time of the year.

16 So these kind of actions, asking you to apply less,
17 would result in lower yields of either triticale or
18 grass. They wouldn't be managed to their higher level
19 productivity.

20 Q And that would, in turn, make them less protective of
21 groundwater?

22 A In my opinion, yes.

23 Q Okay. Thank you.

24 You were asked by Ecology about sampling beneath
25 lagoons regarding the question of viruses.

1 A Correct.

2 Q Would you -- in your opinion, would you need to sample
3 beneath a lagoon regarding a virus?

4 A Well, depends on the interest of the study. As it
5 relates to viruses of human concern from cattle, no, you
6 would not.

7 Q And that's simply because they don't transfer?

8 A Correct.

9 Q Thank you.

10 In the Sullivan and Cogger document, is planting a
11 cover or a double crop an alternative to reducing land
12 application of nutrients?

13 A So when that bulletin was written, cover cropping wasn't
14 a real routine practice. So it's really not really
15 written into that bulletin, the fall soil nitrate
16 bulletin.

17 Q So what is it?

18 A Well, the double cropping isn't really considered as a
19 way that those guidelines were originally written.

20 Q Because double cropping wasn't a --

21 A Wasn't a common practice at that point in time. It's
22 only been during the last technically ten years, but
23 going on fifteen.

24 MS. NICHOLSON: I believe that's it,
25 Your Honor.

1 JUDGE FRANCKS: Okay. Board
2 questions?

3 MR. TEBBUTT: Your Honor, may I ask
4 two questions?

5 JUDGE FRANCKS: No.

6 MR. TEBBUTT: Because there were --

7 JUDGE FRANCKS: We do redirect and
8 then we do board questions. You can hope that the board
9 members ask something that you're --

10 MR. TEBBUTT: The witness just brought
11 up a brand-new issue about something that was outside
12 prior testimony, and it's kind of an important issue
13 about viruses and zoonotics and how they -- how viruses
14 transfer to -- from animals to humans.

15 JUDGE FRANCKS: And we've already
16 talked about that, and I've already ruled.

17 So board questions?

18 MS. MARCHIORO: I just had a couple
19 questions.

20 EXAMINATION

21 BY MS. MARCHIORO:

22 Q So I'm just trying to understand, and I don't mean anyone
23 to take this in the wrong way, but I'm trying to get a
24 sense of the sophistication of the dairy farmers in terms
25 of you're under a permit and either can't understand or

1 they can't understand it.

2 So have you worked with any dairies in trying to
3 implement the prior NPDES permit?

4 A So my role -- starting back in around 2000, we -- a group
5 of us worked on writing what we call a CAFO fact sheets.

6 And so, for instance, the CAFO fact sheet that I was
7 a primary author -- was coauthor on a few, but the
8 primary one I remember was the -- what's called ag
9 stormwater exemption.

10 And so that one can be kind of tricky for people to
11 understand, so I tried to get it in really simple
12 language, give examples.

13 And so my primary audience as a faculty member of
14 the university for the last three years has primarily
15 been the advisors of producers.

16 And I do go to producer meetings and I do give some
17 producer talks, but in this state and many states,
18 whether it be nutritionists or agronomists or what we
19 call technical service providers in the agronomic and
20 soil area, we work with a lot of those advisors.

21 So even helping them understand, have those fact
22 sheets available, which then they can work with their
23 producers.

24 Q So that would include the local conservations districts?

25 A Yes. Yes.

1 Q And then in terms of -- so you got your fact sheets.

2 And does Ecology also produce fact sheets for these
3 types of NPDES permits?

4 A There is an interpretive guide -- I don't know the exact
5 name of it, but I did look it up on the Web -- that does
6 provide some guidance for that.

7 It's not as extensive as what we did, say, back in
8 early 2000s with those fact sheets.

9 The other educational tool that we've had is the
10 conservation districts have an annual meeting that they
11 hold in Leavenworth every year, and so I've been involved
12 in a number of programs as a speaker to, again, try to
13 help interpret a lot of these regulatory issues.

14 Q And are you familiar with the requirements -- statutory
15 requirements for technical assistance to be provided to
16 individuals under a permit or regulation by Ecology?

17 A Yes.

18 Q Okay. So that's available here too; correct?

19 A Yes.

20 Q So any concern that you've expressed about this table --
21 just trying to understand.

22 You have some concerns about it, but it doesn't mean
23 it's not -- I understand your concerns and whether you
24 think it's going to --

25 A Yeah.

1 Q -- but doesn't mean it's not necessarily implementable.
2 It's just a matter of making certain that the
3 agricultural operator knows where the limits are and does
4 the test?

5 A Yeah. We want to get it implemented in a way that's not
6 confusing, and, therefore, they would not subsequently be
7 meeting the intent of the permit and then could be
8 subject to penalties or other things, so, yeah.

9 Q Okay.

10 A Clarity is good.

11 Q And just trying to understand, NPDES permits, state waste
12 discharge permits, they're issued in a five-year cycle;
13 right? They try to do that?

14 A That's the intent, yep.

15 Q So you were asked some questions about the last time this
16 particular permit, the singular one, was before the
17 board.

18 And my experience with NPDES permits is, there's an
19 attempt to evolve them over time, improve and do things
20 like that.

21 What changes has there been in the dairy industry
22 since the last time this CAFO permit was issued that you
23 can articulate as the -- has the industry evolved or is
24 it just this permit is now sort of bringing it up to
25 standards that were even maybe a little bit too far of a

1 reach last time the permit was issued?

2 A Well, I think that, again, I mentioned this earlier,
3 probably didn't stick very well, but much of what is in
4 this permit, not everything, but much of what's in this
5 permit is already required by all the dairies in the
6 state.

7 Now, there's permits for more than just dairies. It
8 could be for beef cattle or other livestock facilities.
9 So it's -- while we're here talking about dairy, it has
10 broader -- a broader sweep than just dairy in the state,
11 so it could be for beef.

12 So changes within industry, we've seen operations
13 get larger and so their staff become more sophisticated.

14 So we have people that are really designated towards
15 the manure management aspect, towards CAFO growing,
16 towards cropping.

17 And so we see people that are dedicated to those
18 rather than having -- wearing multiple hats all in the
19 same day. So I think there's a sophistication from that
20 standpoint in the industry.

21 Certainly technologies out there are available for
22 managing manure, whether it be the land application side
23 of it or the ability to separate out nutrients and
24 separate out the large fractions of solids so that
25 lagoons are more easily managed.

1 Those are all areas that technology has advanced in,
2 and we've got dairy tech company in Northwest Washington
3 and Lynden become actually nationally known for their
4 innovative technology for manure management, so --

5 Q And when did the federal government issue -- EPA issue
6 the first CAFO permit? Are you aware?

7 A You know, I just looked at that PowerPoint the other
8 night. So I -- there's, I think, a 1948 act of some sort
9 that related to water, and there's another, 1972.

10 And then I believe it was couple decades later then
11 they were sued, that they weren't updating their permit
12 frequently enough. So then they started to go in these
13 five-year cycles, so I think that was as a result of the
14 five-year cycles.

15 MS. MARCHIORO: I can't remember the
16 last one. Thank you.

17 JUDGE FRANCKS: Ms. Brown.

18 EXAMINATION

19 BY MS. BROWN:

20 Q Yeah. So I just had a few questions here. You mentioned
21 early on in your testimony something about technology
22 that can measure seepage from manure lagoon --

23 A Yes.

24 Q -- or there's a couple of kinds of those.

25 A Correct.

1 Q Could you explain a little bit about those.

2 A Okay. So through the Conservation Innovation Grant
3 program within NRCS, they funded some research. And I
4 think a lot of the work was done in Michigan, but
5 essentially what you'll have is a system that floats on
6 top of the lagoon.

7 And the idea is that you do these measurements when
8 there's no inflow or outflow of the manure lagoons. So
9 what they typically do is, they suggest you do it from
10 the late evening until the next morning where you don't
11 flush your dairies. You don't have any manure movement
12 into or out of that lagoon.

13 So it's a system that floats on the surface, and it
14 measures very small because it's a pretty small movement.

15 And then there's also a system that measures the
16 evaporation transportation, the ET, that would occur at
17 the same time.

18 And so with that equipment, then, they'll have it on
19 the lagoon for, say, eight to ten hours. It would be
20 desirable to have it longer than that, but the dairies
21 need to function, and they need to keep managing manure,
22 so that's why they use it on an eight-hour basis.

23 That particular equipment has been used in our state
24 once already, and it's available through the State and
25 NRCS office on request.

1 The second technology is one that's called a
2 resistance array, and essentially you think of it as a
3 series of rods which would be pushed down alongside the
4 lagoon bank and towards the bottom of the lagoon.

5 And then there's electrical conductivity runs
6 through that, and when that resistance changes, that's an
7 indication there's seepage.

8 And then what you would have to do is go in and do
9 sampling then to determine what that -- and that
10 technology is under demonstration right now on one new
11 lagoon that was built a year ago and one existing lagoon,
12 both of those in Eastern Washington.

13 So the data is being collected, as we're sitting
14 here, and I spoke with a faculty member about that a few
15 weeks ago.

16 And he said at this point they aren't seeing any --
17 they aren't seeing any changes in conductivity, so time
18 will tell, be multiyear project.

19 Q How accurate are those measurements?

20 A So obviously, when we're talking about these ten to the
21 six, ten to the seventh, and all the units and so forth,
22 it's a small amount, and so we're looking at a small
23 difference in a lagoon.

24 The engineers developed it and have done the beta
25 testing and now released it for routine use, so feel that

1 the accuracy is there.

2 Q Within the scale that it needs to be to detect leaking?

3 A Correct.

4 Q Okay. And how expensive are they?

5 A So when we -- we hit that limit about two years ago, and
6 I knew that question was going to come up with the
7 webinar audience, so I kind of pushed them.

8 And it was in the early release of it, and at that
9 time they seemed to indicate it was about \$10,000 an
10 evaluation.

11 Q For either system or --

12 A That -- I was just going to say, the array, I'm not sure.
13 I have not been personally involved in that system, so --
14 and I didn't ask recently, but that would be, I'm sure,
15 more expensive system to install.

16 Q So the cost is sort of comparable to the liners to non --

17 A Oh, much less expense -- so if you hit a \$10,000 seepage
18 test, which you could. I mean, we're -- the numbers --
19 when I -- when I put the numbers together by doing case
20 studies with dairies that had installed these liners, the
21 numbers ranged from 40,000 to 600- to 700,000, depending
22 on how many lagoons and how many cows you had and how
23 much dirt work is done to retrofit and that whole piece
24 of it.

25 Actually, those numbers weren't part of the

1 estimate. They were from materials and for installation
2 of the new, but if you had to go in and actually do all
3 the dirt work and engineering to prepare to do it, that
4 one is a real unknown.

5 And it's almost a, you know, farm by farm. So those
6 original numbers of say 40- to 600,000 were
7 underestimates of true total cost.

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

9 You said something just -- I just didn't understand.
10 I was wondering. You said something about aeration of
11 soil, reason that we're moving toward no tilling.

12 A Yeah. So one of the things that -- there's -- so running
13 tractors over fields is expensive obviously. So less
14 time you can run your tractor over the field, the better
15 off you are from a fuel standpoint and maintenance and
16 wear and tear of equipment.

17 But the other thing is that, when you completely
18 till soil, so you plow it, you disc it, you rotivate it,
19 you till it, all that breaks up a lot of that soil
20 organic matter, and then it converts from an organic
21 nitrogen source over to nitrate.

22 So if we can avoid some of that -- and we've done a
23 little bit of that work both at that -- the Whatcom study
24 with -- the Carey study we've talked about a bit, and
25 we've done it on some fields. It's been tricky. We tend

1 to have cool soils here in the Northwest, particularly in
2 Western Washington.

3 And so doing minimal tillage, you have to have the
4 right soil temperature and the right moisture conditions
5 to make it work, so -- and the right soil type.

6 So it's not for everybody, but there is some options
7 there to minimize breakdown of that organic nitrogen into
8 nitrate.

9 Q Okay. And my last question: I'm just trying to
10 understand your position or your thoughts, I guess is a
11 better way to say it, about groundwater monitoring.

12 A Yeah.

13 Q Because I believe you said that you don't think it's
14 necessary for the CAFO permit, but, on the other hand,
15 you said it's the only way to accurately know nitrates
16 into groundwater?

17 A Right.

18 Q So can you explain that a little bit more to me, please.

19 A So let's start with -- if you want to know what nitrate
20 is in this glass of water, you've got to send it off to
21 the lab. Okay. There isn't anything else that's going
22 to predict it.

23 You could say that you're -- if they do a quarterly,
24 your quarterly report from your water company says, "Here
25 is what our recent estimates were, and so, you know, the

1 water a week from now should be clean."

2 But you aren't going to know it's clean a week from
3 now unless you sample it. So it's that same sort of
4 concept.

5 But are there indicators that -- practices, in this
6 case, nutrient management plans or a permit, are -- have
7 a set of conditions which would be protective of
8 groundwater.

9 And I think that if we are collecting manure, we're
10 storing it, and then we're land applying it at agronomic
11 rates, that those practices, along with knowing some
12 monitoring of how well are you doing with applying
13 agronomic rates by doing soil tests, by doing crop tests,
14 that those collectively, as a suite of practices, would
15 be then protective of groundwater.

16 Does that help?

17 MS. BROWN: Yeah. That is helpful.

18 Thank you.

19 JUDGE FRANCKS: Mr. Wise?

20 EXAMINATION

21 BY MR. WISE:

22 Q I just had a couple. Good morning, Dr. Harrison.

23 A Good morning.

24 Q I think you also said that you wouldn't recommend
25 sampling in the spring for nitrates.

1 Can you explain that a little bit more.

2 A Yeah. On the west side. Because of the high rainfall we
3 have here on the west side and the movement, utilization
4 of the nitrate as well as movement, we -- when you soil
5 sample, say, in February, particularly that February time
6 period, the levels are low. So it's not worth the time
7 and expense to find out that you've got a low level.

8 And we've repeatedly shown it and in experiments,
9 and the field agronomists that work with producers will
10 say the same thing. It's just not worth the time for
11 what you could possibly gain from it, so --

12 Q Okay. Just had one dumb question.

13 What's triticales?

14 A Triticales is a hybrid grain. It's actually wheat and
15 rye, in particular, combination of those two. And it's a
16 very high yielding crop.

17 And typically what producers will do is, they'll
18 harvest before it goes to grain. So it's a very highly
19 digestible crop, and it does a really good job of taking
20 up both nitrogen and phosphorous.

21 Some of the work that we did in Western Washington
22 indicated that the nitrogen uptake could be -- over that
23 winter growing period could be a very high percentage of
24 what the corn crop would take up during its growing
25 season.

1 So really good aggressive crop.

2 MR. WISE: Thank you.

3 JUDGE FRANCKS: Ms. Marchioro, did you
4 remember your other question?

5 MS. MARCHIORO: Actually, I've been
6 working towards a new one.

7 EXAMINATION

8 BY MS. MARCHIORO:

9 Q So in term of groundwater sampling and then you said the
10 conditions -- you said it's conditions in the permit, but
11 conditions on how people operate their CAFOs or dairies.

12 And I'm just trying to understand, if you then
13 compare to what's been -- I forget what they referred to
14 because I was gone last week -- the group -- the cluster
15 dairies over there on the east side.

16 So I'm just trying to understand, what was the
17 downfall there in their operations such that you had high
18 nitrates in the aquifer?

19 A So --

20 Q If you know. I don't know if you --

21 A Yeah. So I guess I won't go as far as aquifer. I'll go
22 as far as what's in the report that has been presented.

23 And that four-year data said -- it clearly shows
24 there was large amounts of land application of manure,
25 which resulted in high amounts of nitrogen in the soil.

1 And the groundwater wells that they have -- that
2 they have at the dairy, the report clearly shows that
3 there's a relationship between that soil nitrates -- this
4 higher soil nitrate levels and this groundwater wells.

5 I won't go as far as -- go to the aquifer because
6 I'm not a hydrogeologist or understand all that movement
7 in that whole region.

8 Q Okay. I may have misused the scientific term, but in
9 terms of -- so land application would be one.

10 Would it also -- I haven't read the report closely
11 enough to know whether there was a relationship between
12 the lagoon seepage. Do you recall?

13 A Yeah. I'm not a good one to ask on the lagoon seepage.
14 I think experts have been up here on that piece.

15 Q Okay. And then in terms of a properly managed lagoon,
16 how often would a properly managed lagoon be empty in a
17 one-year period?

18 A There's -- lagoons ought to be empty at least once a year
19 at minimum.

20 Q And then there are maintenance practices once they are --
21 there's no longer liquids in them to --

22 A They refill them, but I'm sure that they're doing a
23 visual evaluation of them as they, you know, empty them.

24 Q But there's not -- is there a solids removal on a
25 periodic basis? Annual basis?

1 A Well, that's one of the things that's -- with the
2 technologies in solids, large particle solids removal, in
3 particular, that the dairies are doing a much better job
4 keeping those large particles out, which minimizes how
5 much they have to go to lagoons.

6 And so with agitation, many of them are able to
7 manage those to where there's very little solids in the
8 bottom of those lagoons.

9 They don't have to actually go in with trackhoes or
10 really sophisticated expensive equipment to move those
11 solids out.

12 Q Okay. So in terms of -- let's say there's the milking
13 parlor and you've got the -- taking all of the wash down,
14 the milk where the cows have been, there's some process
15 before to separate as opposed to letting it settle and
16 there's a process before?

17 A Correct.

18 Q Okay.

19 A Actually run across what we call liquid solid separator
20 and there's probably three primary types out of the
21 industry that are currently being used.

22 Q Is that a common practice employed across -- from your
23 experience, across CAFOs or dairies, small to large?

24 A Yeah, there is. In fact, I was involved in a research
25 study a few years ago where there was -- one of the

1 primary things of interest was to know how much of the
2 large particle solids were harvested in Eastern
3 Washington.

4 And so we were looking at taking those solids and
5 making a replacement for petroleum out of it with real
6 high pressure systems and working with the Patel
7 (phonetic) Labs in the Tri-Cities area.

8 Anyhow, so I worked with conservation district staff
9 in Eastern Washington to say, "What percent of our
10 dairies in that area as a geography were using some sort
11 of liquid solid separation?"

12 And at that time, which was nearly 15 years ago, it
13 was almost 100 percent of the dairies were doing
14 separation.

15 Q And so then solids are put into piles to dry.

16 And how were they then used after --

17 A So they can -- typically, they'll compost them, and they
18 can be exported off the farm. There's actually fairly
19 high demand for those solids.

20 They can also be recycled as bedding for the
21 animals. So those would be the two primary uses.

22 Q They're not -- but, like, the liquid, they're not
23 necessarily put on the crops as compost?

24 A Not necessarily.

25 MS. MARCHIORO: Okay. Great. Thank

1 you.

2 JUDGE FRANCKS: Any other questions?

3 Okay. Questions based on the board questions?

4 Ms. Barney?

5 MS. BARNEY: Nothing from Ecology.

6 MR. TEBBUTT: Of course I have a few.

7 FURTHER EXAMINATION

8 BY MR. TEBBUTT:

9 Q Again, you don't know if there are impacts to groundwater
10 unless you actually test the groundwater; correct?

11 A Correct.

12 Q And you're familiar that both the Sumas-Blaine Aquifer
13 and the Yakima Valley Aquifer have been contaminated
14 above the maximum contaminant level for nitrates;
15 correct?

16 MS. NICHOLSON: Objection. Assumes
17 facts not in evidence and wasn't addressed in the
18 testimony.

19 MR. TEBBUTT: We've been here for --

20 JUDGE FRANCKS: I'm going to grant the
21 objection based on it wasn't one of the board questions.

22 So you're limited to what the board talked about.

23 MR. TEBBUTT: Well, there were
24 questions about the technology to test the lagoon
25 leakage, and that's directly related to all this, what

1 the whole hearing has been about.

2 So you're sustaining the objection?

3 JUDGE FRANCKS: Yes.

4 MR. TEBBUTT: All right.

5 Q (By Mr. Tebbutt) So you need to know what's left in the
6 spring in order to know what the supposed agronomic
7 application is in the springtime; correct?

8 A In Western Washington, I don't think that's necessary.
9 In Eastern Washington, it's certainly common practice.

10 Q And the reason you don't -- you say you don't need it on
11 the west side is because all the nitrates are already
12 flushed through the soil into the groundwater; right?

13 MS. NICHOLSON: Objection. Misstates
14 testimony.

15 JUDGE FRANCKS: Can you rephrase?

16 Q (By Mr. Tebbutt) Let me ask you this: The reason you
17 don't -- you say you don't have to test in the spring is
18 because the nitrates have already flushed through the
19 system; correct?

20 A So the reason I say that there's not a need to test in
21 the spring is, if you look at research studies which have
22 evaluated the soil nitrates in the spring, there are --
23 they are at a low level.

24 And so amongst my opinion, in combination with my
25 colleagues, is that it's not -- not a productive use of

1 time and money.

2 Q Right. But the Carey study that you did, that you did
3 with Barb Carey indicated that nitrates flushed during
4 the winter, didn't they -- didn't it?

5 A To shallow groundwater wells, yes.

6 MR. TEBBUTT: That's all I have.

7 JUDGE FRANCKS: Okay. Thank you very
8 much, Dr. Harrison. You are excused.

9 Do you have another witness, Ms. Nicholson?

10 MS. NICHOLSON: I do. We're going to
11 call David Haggith.

12 JUDGE FRANCKS: The court reporter
13 will swear you in.

14

15 DAVID HAGGITH, having been first duly sworn by the
16 Certified Court Reporter, testified as
17 follows:

18

19 DIRECT EXAMINATION

20 BY MS. NICHOLSON:

21 Q Good morning.

22 A Good morning.

23 Q Can I have you first take a look at Exhibit I-3, please.

24 A Got it.

25 Q Okay. Can you tell me, is that your resume that you

1 submitted in this appeal?

2 A It is.

3 Q And can you give us a little bit after your educational
4 background.

5 A I was born and raised in England. I always wanted to do
6 farming, so when I graduated from high school, I went to
7 Redding University in South Britain and took a degree in
8 agriculture.

9 Q Okay. And what do you do now?

10 A I'm -- in 1999 I moved over to the United States with my
11 American-born wife, and I have been farming in Britain as
12 a farm manager and for absentee landlords, mainly with
13 the farming company, the landed gentry and investment
14 trust, that sort of thing.

15 Moving over here, was looking to continue to work in
16 agriculture somewhere. It was just at the time that the
17 Nutrient Management Act had been passed there and the
18 Nutrient Management Act -- there was an obvious
19 opportunity for someone -- for a need to be filled within
20 the dairy community, both writing nutrient management
21 plans, which the conservation districts were doing a lot
22 of, but there was a -- there was a big burden of plans
23 needed to be written, but also the follow-up work of
24 helping dairies to comply with the nutrient management
25 act.

1 So myself and four others joined together as a group
2 called N3 Consulting and to provide primarily those
3 services.

4 Q So just to backtrack a little bit and to be clear, how
5 long did you do farm management and farm consulting in
6 England?

7 A I had 12 years with a farm management company that I
8 worked with and worked for. That included managing crop
9 farms, the dairy farm, and also providing consulting
10 services on several thousand acres.

11 Q And then how long have you been with N3 Consulting doing
12 that type of work here?

13 A Since Valentine's Day on -- in 2000.

14 Q Okay. So can you -- let's start from the beginning.

15 Can you give the board an idea of dairy farm
16 operations? What are the components of a dairy farm?

17 A The dairy farms, I think you've heard from previous
18 testimony, range from one or two cows to several thousand
19 cows.

20 They all have in common cows. The barns, the
21 dairies, the milking parlors, the facilities now for
22 collection of manure, for storage of manure, quite often
23 the treatment as we were hearing with the separators, and
24 then the equipment then to move that manure out into --
25 into the fields for fertilizing the fields.

1 And many of the dairies now are -- as they've been
2 really economically been forced to grow, they have taken
3 on multiple facilities as people have retired or sold out
4 around them.

5 Many of the dairies now will have two, three, four
6 farmsteads around the landscape of a county to try and
7 house the animals that they have.

8 Q So the dairy farms -- the fields surrounding the dairy
9 farms aren't contiguous? Is that what you're saying?

10 A They're generally not. My clients vary from half a dozen
11 fields to three or four dozen fields.

12 And you'll have a patch of fields around each
13 farmstead, but you'll also be renting fields from
14 other -- other people in the county to provide the feed
15 for your cows.

16 Q Okay. So who are your clients?

17 A The majority of my clients are dairymen. We do have
18 contracts with -- occasionally have contract with
19 conservation districts to write nutrient management
20 plans, but most of our clients are dairymen and CAFOs.

21 Q And so most of them are CAFOs?

22 A Yes.

23 Q Okay. And do you have clients on both sides of the
24 state?

25 A We do. The majority of our clients are actually north of

1 Seattle on the west side, but we do have clients down
2 here all the way to Vancouver and also all the way over
3 to north of Spokane.

4 Q And what sort of services are you providing to these
5 clients?

6 A We started trying to fill that niche of the nutrient
7 management planning, so we still do quite a lot of
8 nutrient management planning.

9 We also then provide them with services that are
10 required by the State to fulfill their requirements under
11 the Dairy Nutrient Management Act, which would be the
12 soil sampling, manure sampling, so we know what nutrients
13 are in the manure and how it can be used as a fertilizer.

14 And we're also doing forage testing to show the
15 impacts of what they're doing and any required needs from
16 the crops that were not spotting very high.

17 Q So you mentioned nutrient management planning. Can you
18 explain what that is?

19 A Under RCW 90.64, the Dairy Nutrient Management Act, every
20 dairy is required to have a nutrient management plan.
21 And they're quite specific that those are supposed to be
22 signed off by the -- supposed to be approved by the local
23 conservation district.

24 And the conservation district has to -- one of the
25 things they have to check is that they're written to NRCS

1 standards.

2 And those plans are focused really on the manure and
3 how the manure -- how much manure has been produced. One
4 of the key factors of a Dairy Nutrient Management Act is
5 that spreadsheets that books about balance and the number
6 of cows, the size of the cows, the production of the
7 cows, because that -- higher producing cows are generally
8 fed a higher protein ration and will have a thicker,
9 richer manure, and balancing that with the crop acreage
10 on the farm and how those nutrients are going to come in
11 balance with the crop land that's available.

12 Q So you also talked about samples that you do. Can you
13 explain what kind of samples you do and why you do them?

14 A The majority of the sampling we do is -- is soil sampling
15 where we're focused on the full soil nitrate test because
16 that's required under the Dairy Nutrient Management Act.

17 And it's a good measure of how the -- how the
18 field -- how each particular field has performed in terms
19 of its nutrient balance for the year.

20 We're also taking an awful lot of manure samples
21 throughout the year to basically show what the, in a lot
22 of cases, is a very dilute nutrient source and trying to
23 get a value on that so we can ascertain application rates
24 to make sure we're applying agronomically.

25 Q Any other samples that you take?

1 A We're taking forage samples to show what the nutrient
2 needs are of the crops too.

3 Q Is you take soil samples, you take manure samples, and
4 you take forage samples mostly?

5 A Yes.

6 Q Do you also recommend what crops your clients grow?

7 A We do. Part of the nutrient management planning is to
8 look at the whole farm and a balance of cropping.

9 And the -- regardless of rotation through fields,
10 we'll give a -- give a solid nutrient balance. And one
11 of the things that's required, in order to have a farm
12 plan approved, is that there are enough crop acres of the
13 right sorts of crops that they'll use the nutrients in
14 the manure.

15 Q Can you explain the relationship between the plant -- the
16 dairy nutrient management plan and a field budget?

17 A So the nutrient management plan is a big picture. It's
18 a -- a one-time production that will stand until there
19 are significant changes on the facility.

20 The nutrient budget is a year-by-year look at how is
21 that field going to be fed for the year? What are the
22 crops in that field? What are the crop nutrient
23 requirements?

24 And the yield expectations of that -- the quality
25 expectations of that crop and how are those expectations

1 going to be met, whether it be commercial fertilizer or
2 manure, or from the soil itself, mineralization.

3 Q So a field budget takes into account the crop that's
4 being grown and what nutrients that crop requires for
5 what time period?

6 A That's for the entire season. That nutrient budget,
7 yeah.

8 Q So for -- is that a year? A season?

9 A Cropping year, yeah.

10 Q Cropping year. So for each field, each field has a
11 budget for the cropping year to account for all the
12 nutrients that's needed for the crops that you plan to
13 grow?

14 A Correct.

15 Q And is that something you do for your clients? You come
16 up with these field budgets?

17 A We do. It's -- we've got a continuum of clients in terms
18 of their understanding and requirements for our services.
19 So there are many dairymen we work with, and we were
20 talking about sophistication earlier.

21 Many of them have been to college themselves and
22 have learned all this themselves. A lot of them are
23 doing their own budgeting, but we do produce budgets for
24 them.

25 Q So for the clients that hire you to produce a field

1 budgets or -- did you need a glass?

2 So for those clients that you work for that are
3 asking you to do the nutrient budget, the field budget,
4 and the management plan, and some of the soil sampling,
5 what is their aim in hiring you? What are they hoping to
6 achieve?

7 A Well, the aim of all crop farming is to produce the best
8 quality and best production of -- that you can with
9 CAFOs.

10 That's primarily so you can produce a good ration
11 for your cows, that you can feed them well. So our aim
12 is to get the best quality and production that we can
13 from each field.

14 Q What type of crops do your clients typically grow?

15 A On the west side, each dairy is different, but the
16 majority sitting with a balance of somewhere along the
17 lines of 50 percent grass and 50 percent corn. The
18 caveat is, there's a lot of land swapping hands during a
19 season or from year to year, so there may be potatoes on
20 those fields or other seed crops or berries.

21 On the east side, it's a similar sort of 50/50 mix,
22 but the grass is generally replaced with alfalfa. It's
23 far better suited to the east side of the state.

24 Then the other addition over the last 20 years has
25 been more and more people growing cover crops over the

1 winter, either as triticale on the west side, or an
2 annual rye grass is quite often planted on the corn crops
3 on the west side that actually starts growing this
4 time -- it's seeded this time of year, and basically the
5 corn crop, it's already growing in the fall when the crop
6 is harvested.

7 Q You said triticale on the west side. Did you mean the
8 east side?

9 A Sorry. Meant the east side, although there is some
10 triticale. As Dr. Harrison said, it's a pretty hardy
11 crop. And we've been finding that in places where they
12 have to go in after corn. It's one of the best
13 alternatives. It's a cross between wheat and rye, and it
14 seems to handle traffic and the winters better than
15 either of those. So it's a good feed.

16 Q So in order to develop a field budget, which would also
17 involve determining what crop to grow, what would you
18 need to know to be successful in developing a field
19 budget?

20 A You need to know the field really. You need to know the
21 soil type. You need to know the crop, the variety, how
22 it's performed, if it's a perennial crop, how it's been
23 performing in the years up until that point.

24 So you need some pretty in-depth information about
25 that field in order to -- for the budget to be relevant.

1 source.

2 Q I think there's another. It's the four R's of agronomy?

3 A Yes. Yes.

4 Q And how do you know that the application of nutrients is
5 a -- is agronomic? Excuse me.

6 A It's -- a lot of it is based on the timing of the crop,
7 the growth stage of the crop. With corn, you tend to
8 feed it a lot early because, when you get it this time of
9 year, you get this very rapid extension of a crop, and it
10 needs a lot of food right then in order to get its yield.

11 So you tend to feed it early. Also, once it gets --
12 once it tassels, once you get into August, it's no longer
13 taking up much nitrogen at all.

14 But grass crops, the aim with the grass or alfalfa
15 crop is, you don't let it mature. You keep feeding it
16 through the year.

17 As you mow it, as you harvest it, you're preventing
18 it from seeding and maturing, so it's always in that
19 vegetative state and so you keep feeding throughout the
20 year.

21 So your timing is based very much on what type of
22 crop you're growing.

23 Q How does the agronomic application of nutrients relate to
24 dairy operations as a whole?

25 A It's integral really. It's a big old cycle. The

1 nutrients that are in the crops are being fed to the
2 cows, and a lot of that is coming back out in the manure,
3 and it's that primary fertilizer source for the crops.

4 Q Can I ask you to look at Exhibit I-4. No. That's wrong.
5 Yeah. It is right. I-4.

6 And is that your expert report you submitted in this
7 matter?

8 A It is.

9 Q And now I'm going to have you look at something else. I
10 want you to look at the permit language on R-2. It's
11 Page 17. That's going to be in one of the other binders
12 with the green labels.

13 A R-2.

14 Q Mm-hm. And while you're looking for that, are you
15 familiar the CAFO permits?

16 A I am.

17 Q Okay. And what I'd like you to do is look on Page 17.
18 That should be the same page in the PDF, and I'm looking
19 for permit language S4.I.1.

20 A Got it.

21 Q Did you include an opinion about this permit language in
22 your expert report?

23 A I did.

24 Q And what was that opinion?

25 A I -- spring soil sampling on the west side of the state

1 is time-consuming, and it's an unnecessary expense.

2 It's -- it provides us with numbers that we know are low.
3 We've seen it for years. It was low in a similar climate
4 back in Britain when I was farming over there.

5 If you don't feed your crop in the spring, you don't
6 get much of a crop. It's -- consistently low.

7 Q Okay. You mentioned in Western Washington. Is there a
8 difference in Western Washington/Eastern Washington and
9 why would that be?

10 A In Western Washington we get three, four, five feet of
11 rain over the winter, and it has its impacts. And --

12 Q Can I have you look at Exhibit I-37, please. And can you
13 tell me what I-37 is.

14 Oh, I'm sorry. You're not there yet.

15 A This is the NRCS Washington State irrigation guide.

16 Q And did you include a subset of this report in your
17 expert report?

18 A Yes, I did.

19 Q And was that around Page 8?

20 A Yes.

21 Q I believe you included one in particular; Mount Vernon, I
22 believe?

23 A That's right, yes.

24 Q Okay. And what is this telling you? Is this -- what do
25 you rely on for this data?

1 A Well, we use it primarily for irrigation scheduling,
2 which, you know, despite the high rainfall in Western
3 Washington, we still do have irrigation requirements in
4 the summer.

5 But it was here really to just show the level of
6 rainfall we do have.

7 Q On the west side of the state?

8 A On the west side, yep.

9 Q Can we turn back to Exhibit I-4, which is your expert
10 report, on Page 3.

11 A Got it.

12 Q And can you tell me what that is?

13 A That's a table of the soil samples that we took in the
14 spring of 2017 for a variety of clients in Northwest
15 Washington: Snohomish, Skagit, and Whatcom Counties.

16 Q And you said these are soil samples that you took in the
17 spring from your clients.

18 And where were they taken from? Three counties?

19 A Skagit, Whatcom, and Snohomish.

20 Q All western --

21 A All western.

22 Q And when were they taken? You said the spring. Can you
23 give me a --

24 A We started in March, with the aim of getting the -- all
25 the soil samples done that we needed, but last spring

1 being, you know, what it was, it -- we were -- spring
2 soil sampling is a pain because you can't go on the
3 fields when they're soaking wet to get a decent sample or
4 all you'd end up with is a bag of mud.

5 So you have to time it for every field as the crop
6 dries out, and you want to time the soil sample before
7 you put manure on, or commercial fertilizer, for that
8 matter.

9 And so you're jumping about from farm to farm to
10 grab what samples you can on any given day. So while we
11 started in March, it was -- it was beginning of June by
12 the time the last of the samples were taken.

13 Q Can you go through the columns and explain what the
14 columns are in your spring soil sample?

15 A Okay. If you go back one page to Page 2, the column
16 headings are there. Starts with "Farm and Field
17 Identifiers" and then the date that the sample arrived at
18 the laboratory.

19 Then we've got columns for nitrate and ammonium in
20 the soil, and then the following column is basically just
21 a summation of those two, the total available nitrogen in
22 the soil.

23 The next column is where I had it, the full soil
24 test -- full soil nitrate test from the previous year and
25 then obviously the county that the crop was -- the field

1 was in and the crop that was in the field at the time and
2 then a few samples on some of those that match.

3 Q On the first page, I see one of the note says, "Not
4 CAFO."

5 What does that mean?

6 A Some of the fields -- some of my clients aren't CAFOs.
7 So that was a field that was run by a farmer who is not a
8 CAFO crop farmer.

9 Q But you still take soil samples in the spring if they ask
10 you to?

11 A If they ask me to. With the way that the fields seem to
12 change hands, particularly in counties like Skagit County
13 where there's a lot of -- there's a lot of field swapping
14 going on, where Farmer 1 owns the land but doesn't want
15 to farm it, rents it out to Farmer 2.

16 Quite often Farmer 3 gets involved for a year to
17 rent it because it doesn't fit in with his rotation, so
18 it -- there's -- a lot of that goes on.

19 And so we do take some field soil samples in the
20 spring that basically it's a field that's new to a
21 farmer, and he wants to know what levels of nutrients
22 there are in it.

23 Q Looking at the very first entry, it's Farm 7, Field LB --

24 A Yes.

25 Q -- it looks like the fall -- and this is in milligram per

1 kilogram.

2 Is that different from parts per million?

3 A No. It's just a --

4 Q It looks like a fall sample was at 43?

5 A Yes.

6 Q And a spring sample was very low, like average was 3.8?

7 A Yes.

8 Q Does that mean that the 43 parts per million leached down
9 through the soil?

10 A Not necessarily. The crop was a cover crop. It would --
11 it was likely a rye grass cover crop, which can take up
12 to 70, 80 pounds of nitrogen in the fall.

13 And so, yeah, the crop can take up a significant
14 part of that.

15 Q And that's accounted for in your nutrient budget; isn't
16 that correct?

17 A Yes.

18 Q And that's per field it's accounted for?

19 A Yes.

20 Q Okay. So can we look at Exhibit I-48, please. And can
21 you tell us what this is?

22 A This is just a graphical summary of that table of
23 information.

24 Q And please explain the X and Y axis.

25 A So baseline what I did was block up those nitrate levels

1 into blocks of about four pounds, four parts per million.

2 So the first -- the first column is the first from 3
3 to 8 parts per million, and then the next, from 9 to 13
4 parts per million.

5 And then the left-hand axis, the Y axis, are the
6 number of fields that are within that band of nitrogen
7 level.

8 Q And what does that graph show you?

9 A Basically the vast majority of those samples came in
10 below 20 milligrams per kilogram or parts per million.

11 Q And I see that there are some outliers here. Can you
12 explain these outliers?

13 A A lot of those outliers or a lot of those fields we
14 weren't able to get onto. Most of those outliers are
15 fields we weren't able to get onto until that May, June
16 sample timing when they dried out.

17 And it's -- we heard about mineralization occurring
18 in the soil, and it's like sand going through an
19 hourglass during the year.

20 What we're seeing is, as we get later in the year,
21 more of the sand is flowed through the hourglass. More
22 of the mineralization has occurred, so we're seeing more
23 in the nitrogen available in the soil.

24 Q Do your field budgets account for this mineralization?

25 A Our field budgets account for the entirety of that

1 mineralization, all of the sand in the hourglass, if you
2 like, for the entire season, yes.

3 Q So if this graph is showing us that the vast majority of
4 fields are less than 20 parts per million, nitrogen in a
5 spring soil, is that useful to you in any way?

6 A Not really. Because all it's telling us is how much of
7 that sand is passed through the hourglass, how much of
8 that mineralization has occurred.

9 If we use that as a standalone figure, then we have
10 to reduce the mineralization figure that we put in the
11 budget. Otherwise, we're double accounting.

12 So the implications of a soil sample in the spring
13 are minimal.

14 Q So wait. Let me make sure I understand this.

15 So you already account for the mineralization that's
16 occurring, and that this residual that's in the soil,
17 that's already accounted for in the yearly budget per
18 field; is that correct?

19 A Yes.

20 Q Okay. So does it serve any useful purpose in Western
21 Washington to know that that spring soil sample is less
22 than 20 parts per million?

23 A I don't believe it does, no.

24 Q And how much does a soil sample cost to take in a spring
25 soil?

1 A Fifty to eighty dollars.

2 Q Per sample?

3 A Per sample.

4 Q And that's what you charge your clients?

5 A Yes.

6 Q Is this data set typical of what you have seen for the
7 past 18 years?

8 A It is, yes.

9 Q And is this typical of what you saw back in England as
10 well?

11 A Yes.

12 Q So this would be typical of any rainy type of client --
13 or climate?

14 A Yes.

15 Q Is there anything else that supports your position that
16 these spring soil samples don't contain useful
17 information?

18 A There are academic articles out there that reference it.

19 Q Can I have you look at Exhibit I-38, please. Can you
20 tell me what I-38 is?

21 A This is an article written by Bittman and Kowalenko from
22 the research center up at Agassiz at British Columbia.

23 Q And is this a resource upon which you rely, a British
24 resource?

25 A The Agassiz Research Center is one of the primary forage

1 grass research centers in -- on the west -- west coast.
2 And its climate is very similar to Whatcom and Skagit
3 Counties, so, yes, we use their data.

4 Q And where in this paper does it support your opinion? I
5 think you want to look at Page 6 of 7.

6 A The second from last paragraph on the right-hand column,
7 starting with spring. "Spring soil nitrate testing did
8 not show promise for predicting N responsiveness of the
9 sites.

10 "The inorganic nitrogen in the spring that was
11 measured was likely released by early season soil
12 mineralization of soil organic N since autumn nitrate
13 will be leached beyond the root zone during the winter."

14 Q And just to ask a follow-up question there, if the soil
15 nitrate is leached beyond the root zone, does that mean
16 it goes to groundwater?

17 A Not necessarily. But, you know, I'm not a
18 hydrogeologist, but not necessarily.

19 Q Okay.

20 JUDGE FRANCKS: Ms. Nicholson, I'm
21 going to point out that it's a little after noon, so when
22 you have a good breaking point, we'll take a lunch break.

23 MS. NICHOLSON: Okay. Just a few more
24 minutes.

25 JUDGE FRANCKS: Okay.

1 Q (By Ms. Nicholson) And is there any other -- actually,
2 I'm just going have you look at I-39.

3 And what is this paper?

4 A This is another piece from Canada from the Farm West
5 website, which is run by the Agassiz Research Station.

6 Q And, again, this is a resource upon which you rely?

7 A Yes.

8 Q And where does this support your opinion?

9 A Somewhere in that second paragraph. In the middle of
10 there, it's paragraph starting -- sorry -- sentence
11 starting, "In locations where carrier of a nitrate is
12 leached below the root zone over winter, a pre-plant test
13 has limited value for determining fertilizer
14 applications -- fertilizer requirements."

15 Q And, again, if it leaches below the root zone, does that
16 mean it's going to groundwater?

17 A Not necessarily, no.

18 Q Okay. But the fact that it's not there doesn't help you
19 plan for agronomic application; is that correct?

20 A Correct.

21 Q Can we talk a little bit about your expert report. I
22 noticed that that has an updated expert report of David
23 Haggith.

24 Can you tell me why you updated your report?

25 A Following my deposition, I -- there was a request that I

1 supply more information.

2 Q And so which -- in response to a request by a Puget
3 Soundkeeper counsel, what did you update on this report?
4 Was it in your soil sample data?

5 A It was -- there were some samples, eight samples, that
6 weren't included in the original data set. Plus, there
7 was extra information about the location of the -- of the
8 fields that were sampled.

9 Q So can you tell me which columns maybe that you added?
10 And you can go back to Exhibit I-4 on the second page of
11 your report, if that will help you.

12 A I think I added the county, the crop, the notes, and I
13 may have even added the date. I'm not sure.

14 Q And that date is when the lab processed the soil sample?

15 A Yes.

16 Q So you gave them more information and ensured that every
17 single spring sample you took in the spring of 2017 was
18 included in this table; is that correct?

19 A I did, yes.

20 Q And did the data set change?

21 A The data set changed by eight samples.

22 Q And did the data set change of adding eight samples? Did
23 it change your results or your opinion?

24 A No. No. In fact, it was a process to go through because
25 it clarified in my mind what was helping there with

1 eight.

2 Q So the eight samples that you added, did that make it
3 more supportive of your conclusion?

4 A It did.

5 Q Okay. So can you summarize your opinion about spring
6 soil samples in Western Washington for us.

7 A I don't feel that they're worth the hassle and the
8 expense because I don't see them having a significant
9 impact on the nutrient budget for the crop for the year.

10 Q So if I stated it has no value and is an unnecessary cost
11 to producers, would you agree with that?

12 A I would, yes.

13 MS. NICHOLSON: Okay. I would like to
14 move to admit I-34, I-38, and I-4.

15 MS. MATSUMOTO: Your Honor, we object
16 to the extent this data set includes samples that weren't
17 collected from CAFOs. We've raised this argument
18 previously.

19 Additionally, I know there's not a fall sample from
20 any of the data points that are listed here, and so it's
21 difficult to really rely on any opinions that are drawn
22 from incomplete data.

23 MS. NICHOLSON: Your Honor, the fall
24 sample is just included as another data point, if he had
25 it. This is about spring soil samples, so the fall data

1 is just extra information.

2 And the fact that it's not a CAFO is immaterial
3 here. You're still doing a spring sample on a farm
4 field.

5 So whether that field belongs to a CAFO or it
6 doesn't belong to a CAFO, that is really immaterial. The
7 data shows that the sample results in such a low part per
8 million that it has little value.

9 MS. MATSUMOTO: But we're here about
10 the CAFO permit, and without knowing, as Mr. Haggith had
11 said, the field specific cropping history, the manure
12 management history of a field, whether or not it's a CAFO
13 provides little to no relevant information.

14 MS. NICHOLSON: And at their request,
15 we added every single spring test that he took, which
16 included some that were not CAFO.

17 MS. MATSUMOTO: And I would add that
18 should have been added in the initial report because it
19 was directly responsive to discovery requests that were
20 issued well in advance.

21 MS. NICHOLSON: So they're arguing
22 that we included the data that they asked us to include?

23 JUDGE FRANCK: I'm going to allow it.
24 Obviously you'll have cross-examination where you can
25 delve into this, so --

1 MS. NICHOLSON: We are at a good
2 stopping point.

3 JUDGE FRANCKS: Okay. But let me just
4 admit the things you just asked for. I-4, and what else?

5 MS. NICHOLSON: I-38 and I-39.

6 JUDGE FRANCKS: I-4, I-38, and I-39.

7 MS. NICHOLSON: And two more. And
8 I-37 and I-48.

9 JUDGE FRANCKS: Okay. I-37, I-38.

10 MS. NICHOLSON: 48.

11 JUDGE FRANCKS: 39 and then I-48.

12 MS. NICHOLSON: Right.

13 JUDGE FRANCKS: Those all admitted.

14 (Exhibit Nos. I-4, I-37, I-38,
15 I-39, I-48 admitted.)

16 JUDGE FRANCKS: Let us go to lunch.

17 We'll come back at 1:15.

18 We are off the record.

19 (Recess from 12:14 p.m. to
20 1:15 p.m.)

21 JUDGE FRANCKS: Have a seat. Let's go
22 back on the record.

23 Ms. Nicholson, proceed.

24 MS. NICHOLSON: Thank you.

25 DIRECT EXAMINATION (Continuing)

1 BY MS. NICHOLSON:

2 Q Turning to the permit language -- can you make that a
3 little bit bigger? And this is an R-2, S4.I.1. That's
4 Page 17 on PDF.

5 Do you have that?

6 A Yes.

7 Q Is there any other requirement in this permit language
8 that is a significant issue for your producers?

9 A It's this referral to T-sum 200.

10 Q And what is T-sum 200 again?

11 A T-sum is a summation of day degrees from the beginning of
12 the year, starting January 1. T-sum 200 is when that
13 summation reaches 200, which in Whatcom County generally
14 falls somewhere in the -- in the first half of February.
15 Can occur as early as the end of January.

16 Q And why is that a problem?

17 A It's not a problem in such that it -- it's grounded in
18 good science. It was put together back in the '80s is
19 when I first heard about it.

20 Fertilizer companies in Europe who were looking at
21 what was the best timing, what was the most beneficial
22 timing to start applying nitrogen to growing crops,
23 particularly -- well, specifically grass crops, and
24 cereal grains in the spring.

25 And it's definitely borne out in terms of if you're

1 looking for best yield of wheat, then you need to be
2 putting on fertilizer of T-sum 200. Applies just as well
3 to grass.

4 The problem is, all it takes into account is
5 temperature. And it was focused very specifically on
6 commercial fertilizer, which doesn't have -- you know,
7 which is a very dense nutrient source.

8 You can fit on a handcart at Home Depot the amount
9 of nitrogen you could fit in a lagoon or a tank this size
10 of manure. So it's a very dense nutrient source.

11 When you're talking about manure, you've got a lot
12 of potential for runoff. You've got a lot of potential
13 for other issues that surround manure, and I just think
14 we need to be looking at more than just temperature.

15 Q So did you recommend a different alternative in your
16 expert report?

17 A I looked at the application resource -- application risk
18 management program that's been developed in Whatcom by
19 the conservation district there under EPA ground.

20 Q And why is it superior to T-sum?

21 A It looks at a much wider set of characteristics. It
22 looks at -- initially it looks at weather forecasting.
23 It then also drills beyond that.

24 Once you've got a weather forecast that looks good,
25 you have to look at the soils that you have in your field

1 and the various risk factors that you have in your field,
2 such as proximity to groundwater, proximity to surface
3 water.

4 You also need to assess your crop to make sure that
5 it's of a dense enough stand that it needs and can
6 utilize that manure.

7 So it looks at a variety of far bigger variety of
8 factors.

9 Q That sounds like it's very site-specific factors. Is
10 that --

11 A Yes. You can't really do -- you can't really fill ARM
12 and fill out the reports or the spreadsheets that are
13 required for it without putting your boots on and getting
14 out in the field and digging holes.

15 Q And where is ARM in use currently?

16 A It started off in Whatcom County and has basically spread
17 out. It includes all the farm plans that are written now
18 in Whatcom, Skagit, Snohomish. Also King County has
19 adopted it and the dairy -- the dairy inspection program
20 with Washington State Department of Agriculture.

21 They're recommending that, particularly in the
22 shoulder seasons, in the spring and the fall, that people
23 use that as their method of ascertaining which fields and
24 when is an appropriate time to apply.

25 Q So your clients in Whatcom and Skagit and Snohomish and

1 King County, they are using ARM currently?

2 A Yes.

3 Q And how is it working for them?

4 A It's working very well. It's borne out with the water
5 quality numbers that we're seeing. We're just -- we're
6 seeing people applying at less risky times.

7 Q And what evidence do you have of ARM working within
8 Whatcom County?

9 A The County is routinely sampling water in a process that
10 really looking at the shellfish beds but looking at also
11 the surface water within the county, all the main
12 tributaries to the Nooksack River. And the Nooksack
13 River itself are sampled every month.

14 Q Can I have you look at Exhibit I-46 because I believe
15 that's what you're speaking to.

16 And can you tell me what this is and where you
17 obtained it?

18 A So this is a report from the Whatcom County Public Works
19 that was presented to a joint shellfish protection area
20 meeting, looking at -- two different graphs.

21 The top graph is the time period 2012 to 2014. The
22 lower graph is '15 to '18. Each bar represents a
23 different sampling location within the county, and the
24 bars represent an average of that total data set.

25 So that 30-something samples that they took within

1 that time period is averaged, and the little black dots
2 are just the final 12 months of that time period.

3 So -- and then the line across the middle is that
4 100 fecal coliform where surface water -- where the
5 surface water standard sits in terms of that's the number
6 we're trying to meet.

7 Q So just to interrupt you just briefly, on the top graph
8 in the 2012 to 2014 time period, in the last year, the
9 mean was actually higher than in the --

10 A Yes.

11 Q -- the previous years?

12 A So the point of presenting this here and the point also
13 of presenting it to the joint shellfish meeting was to
14 say that, look, back in 2012 to 2014, our numbers
15 generally were higher, but they were also rising, and
16 there was some concern of what was happening out there in
17 the county.

18 Now, this latest data set from 2015-2018, the little
19 black dot is within the bars of the line -- the bar, and
20 showing that the latest 12 months are actually better
21 than the average of the 36 months.

22 And those -- the 36th month lines are also lower and
23 so basically it's just showing that water quality is
24 getting better.

25 Q And do you attribute that to the use of ARM?

1 A I think there are a lot of factors in play. But I think,
2 when you look at the CAFOs in the county, that's the
3 biggest difference between those two, is the widespread
4 use of the ARM program in the county.

5 Q And has ARM been published in any peer-reviewed paper?

6 A It is in the -- there's an article about it in the
7 Journal of Environmental Quality that compares and
8 considers it and several other similar programs
9 throughout the nation in different states and looking at
10 how they -- what different factors they take into effect
11 and into account, and then just looking at the sciences
12 that's moving forward, and really just a report on what's
13 happening in other states.

14 Q And do you agree with Dr. Harrison, that the Journal of
15 Environmental Quality is a reliable and reputable source
16 of new and groundbreaking research?

17 A That's certainly the reputation it has, yes.

18 Q So when was it published?

19 A I believe in 2017, second half of 2017. I'm not sure.

20 Q Okay. Is ARM more protective of ground and surface
21 water?

22 A I believe it is, yes.

23 Q And why do you believe that?

24 A Because of numbers like this and seeing my clients and
25 other farmers around using it effectively as a tool to

1 protect groundwater, surface water particularly, but also
2 groundwater too.

3 Q So is it your opinion that the permit should use ARM
4 instead of T-sum in Western Washington under the permit
5 S4.J?

6 A I think, if the aim is to protect water quality, then
7 yes.

8 Q And does it give you any hesitation to use ARM because it
9 hasn't been considered final by Whatcom County?

10 A No. Just because of the results of it. I certainly
11 recommend my clients to use it because it gives them that
12 extra level of clarification of the situation in a
13 particular field on a particular day.

14 And it's a document that they can fill in before
15 they apply, print out, and they can show that they took
16 into account the considerations of depth to soil water
17 and closest to surface water, the slope, all the
18 different considerations in the field that would be
19 logical to take into account a -- they can actually
20 catalog them as they proceed.

21 Q So is it correct to say that the T-sum 200 takes into
22 account one piece of information, which is temperature?

23 A Correct.

24 Q While ARM takes into account site-specific information?

25 A Yes.

1 Q Okay. Should the permit use ARM instead of T-sum 200 in
2 Eastern Washington?

3 A It hasn't been -- it wasn't designed for Eastern
4 Washington, and I don't -- I'm not aware of any work
5 they've done in Eastern Washington using ARM, so I
6 wouldn't -- I wouldn't propose that.

7 Q So ARM was designed basically for British Columbia,
8 Western Washington?

9 A Yes.

10 Q England?

11 A It would be a good tool to use in England too, I think,
12 yes, in terms of spring weather.

13 Q So can we turn to R-2 under Section S4.J, and I'm looking
14 under the "Restrictions" under Subsection 3. I believe
15 that's on Page 21 in the PDF -- 20.

16 So in Eastern Washington, what would you recommend
17 for spring application?

18 A I -- I think, within the permit conditions themselves,
19 they are pretty clear about not applying in conditions
20 where manure is going to move, so I don't know that the
21 ARM program would fit Eastern Washington, but the permit
22 conditions would still apply.

23 Q Yes. And would those permit conditions be protective of
24 groundwater?

25 A I believe they would.

1 Q And what are those conditions, if you would list them for
2 me? What -- when can you not apply under this permit?

3 A Can't apply to fields that have got a frozen crust or if
4 the soil is below zero degrees Celsius; to fields that
5 are snow covered or to fields with saturated soil, or if
6 the water table is within 12 inches or less of the
7 surface; and then also if precipitation is forecast
8 within the next 24 hours; and then to fields that are
9 bare unless the permittee is preparing the field for the
10 next year's crop.

11 Q And the reason why that's protective is because of
12 climate?

13 A It's -- yes. Because climate is just -- you're not
14 expecting the kind of rain events that we get in Western
15 Washington with great regularity in the spring.

16 Q So it's your opinion to use ARM on the western side of
17 the state to make that determination; is that correct?

18 A Yes.

19 Q And on the eastern side of the state, you think you can
20 rely on the permit terms as they stand without using the
21 artificial date of T-sum 200; is that correct?

22 A I do, yes.

23 MS. NICHOLSON: I'd like to move to
24 admit I-46.

25 JUDGE FRANCKS: 46 is admitted.

1 (Exhibit No. I-46 admitted.)

2 Q (By Ms. Nicholson) Can you turn back to Page 17, and I
3 want you to look particularly at the fall soil sample
4 requirement in the permit.

5 A Page 18?

6 Q Might be 18. Sorry.

7 A Okay.

8 Q So is the fall soil sample requirement attainable for all
9 of your clients?

10 A Well, here the hiccup is this October the 1st, comma,
11 after harvest of annual crops. Well, that isn't after
12 harvest of annual crops in the majority of cases.

13 Corn is only just adapted to our climate on the west
14 side of the Cascades, so you don't want to get a mature
15 crop. You try and leave it as long as you can in the
16 field, which often leads to harvest happening in the --
17 well into October.

18 Q So earlier we heard that farmers cannot take a sample
19 prior to harvest because it causes crop damage and waste.

20 Do you agree with that?

21 A Yes. You've got to take -- in order to take a decent
22 soil sample, you've got to cover the majority of the
23 field in a randomized pattern, and you just can't do that
24 in a 16-foot crop of corn.

25 Q Would you obtain valid data of a fall soil sample test

1 while the crop was still growing?

2 A Well, that's the other side of things, is that if your
3 crop is growing, it still has the potential to be taking
4 up nutrients.

5 Better process would be to take it after harvest,
6 but the stipulation then is, if it's after October the
7 1st, we have to go down to the second foot.

8 And sampling at that second foot in early October
9 when the soil is not yet moist all the way down, you --
10 it's really difficult to get down there for a second
11 foot.

12 We've had to -- a 300-pound guy on the end of a soil
13 probe, beating the dickens out of it and breaking all
14 sorts of equipment just to get down to that second foot.

15 Q So what you're saying here -- I'm just going to interrupt
16 you briefly -- if your producers are still harvesting
17 after October 1st, under the permit terms, they are then
18 required to take a second foot regardless of whether the
19 heavy rains have come for the fall; is that correct?

20 A Correct.

21 Q Okay. And the problem with that is that the second foot
22 is difficult -- a second-foot test is very difficult to
23 obtain when it's dry?

24 A Yes.

25 MS. MATSUMOTO: Objection. Leading.

1 JUDGE FRANCKS: I'm going to allow it.

2 A The second-foot sample -- the top foot of soil is what's
3 generally tilled. So it's nice and loose, and it's very
4 easy to take a sample of the top foot.

5 Once you get below that top foot, you're into much
6 tougher, tighter soil. And with the addition of
7 moisture, it's easy to take a sample. While it's dry and
8 hard, it's a more difficult job.

9 Q (By Ms. Nicholson) And have you taken second-foot soil
10 samples?

11 A We have when the dairy nutrient back was first put in
12 place. The NRCS 590 standard was to sample to two feet.

13 And in that time period, between Dairy Nutrient
14 Management Act coming into place and the production of
15 the Sullivan/Cogger document about the four soil
16 sampling, there were a lot of second-foot samples taken.

17 And part of the reason for this -- the
18 Cogger/Sullivan report was to look at, when was a good
19 time to be going down to that second foot because they
20 didn't want a bunch of irrelevant work being done out in
21 the field.

22 Q How much extra time did it take to take those
23 second-foot --

24 A When the ground is dry, it -- three or four times the
25 length of time it would take to normally sample a field.

1 Q So let's just take Whatcom County as an example. When do
2 the heavy rains normally come in Whatcom County?

3 A We usually see them -- when we're talking about heavy
4 rains, we're looking at four to five inches of rain.
5 That's about what it takes to saturate the top foot of
6 soil.

7 And that's what it takes for us to start seeing a
8 full-foot soil probe having moisture all the way to the
9 base of it, and that -- it's -- usually we're into the
10 second half of October usually when that happens.

11 Last year it was in the -- around about 23rd to the
12 26th of October, we got several days of pretty intense
13 rain, and that got the soils wetted up.

14 Q Are dairy producers inclined to harvest after heavy rains
15 begin?

16 A No. And people like to push out the envelope and get the
17 crop as mature as they possibly can, but the last thing
18 you want to do is have your field in standing -- standing
19 in rain because partly pushes up the moisture content of
20 your crop, but it also makes harvest messy and more
21 complicated.

22 So people tend to watch -- be watching the weather
23 forecast very closely in October to make sure their crops
24 come off before they get very heavy rain.

25 Q So can you obtain a valid and useful fall soil nitrate

1 test of October 1st but before the heavy rains?

2 A Yes.

3 Q What would happen if a farmer or producer misjudged and
4 they harvested and took their sample after the heavy
5 rains began? What do you think should happen?

6 A Then they should be going down to the full two feet.
7 They should be.

8 Q And why is that?

9 A Because there is the potential to move nitrogen down with
10 that rainwater.

11 Q And in that case, the water has penetrated the soil
12 level. Is it easier to get the soil sample at that
13 point?

14 A Oh, yeah. It's much easier.

15 Q And does second foot actually contains valuable data?

16 A Yes.

17 Q So is it your opinion that the October 1st date is
18 unattainable?

19 A I -- it's unattainable, yes. I mean, that -- yes.

20 Q Have a pretty easy solution to that permit language?

21 A I think, you know, the Sullivan/Cogger information is
22 basically showing that we should be sampling after that
23 significant rain in the fall.

24 Q Right before that significant --

25 A Right. Right before that significant rain, even if

1 it's -- even if that pushes us into October sampling at a
2 foot, and then once we've had that significant rain, then
3 going down to two feet.

4 Q And we've been talking about the fall soil nitrate test
5 that's also called the FSNT; is that correct?

6 A Yes.

7 Q And can you give us a little idea of what you're using
8 the fall soil nitrate test for.

9 A Some people call it the report card test because it's --
10 you're basically looking at the level of nitrogen that's
11 in your -- in your field remaining at the end of the year
12 after the crops come off.

13 Q If you could look over your shoulder to Table 3, which
14 has categories of fall soil nitrate tests, does the high
15 FSNT necessarily cause you concern?

16 A Like all soil samples, it's something that has to be
17 taken while considering the crop and the field that
18 was -- that was grown there and any crop that may be
19 continuing to grow there and also look at the timing.

20 The fall soil sample could happen anytime from the
21 beginning of September to the end of October. Having --
22 that's a big chunk of the growing season, and crops needs
23 to grow.

24 So just because it's in the high level, you've got
25 an actively growing crop, they could be using those

1 nutrients.

2 Q Does a very high FSNT necessarily cause concern? And
3 under "Very High," look at that box. It's 45 parts per
4 million.

5 A So, again, the same sort of thing applies. The --
6 obviously, once you get up to that 45 parts per million,
7 you start to get more concerned.

8 So, yes, I mean, it's certainly more concern than
9 the -- just that 30 to 45 parts per million, but you
10 still -- if you've got an actively growing crop, a good
11 percentage of that nitrogen is going to be used.

12 Q And do very many of your clients ever see a 45 parts per
13 million, a very high fall soil nitrate?

14 A We see some every year. There are conditions out in
15 fields that you can't control the climate, and so --

16 Q What are those conditions? Maybe you could explain that.

17 A Okay. One of the -- there are several. One of the
18 classics is, you plow down a stand of grass, and it
19 takes -- you know, you had your grass in the field for
20 five or six years.

21 It's got five or six years of growth under the
22 ground there with the roots and the crown of the crop.
23 When you plow that down, you get a big release of
24 nitrogen from that.

25 You can't control that, and that tends to result in

1 that first year of let's say another annual crop, going
2 back to grass, that year you do see a pulse above
3 45 parts per million quite regularly.

4 Q So --

5 A And another cause, sometimes in -- we've had a very dry
6 August and a dry September and we get a high rainfall
7 event in September.

8 While the soils are really warm, we will see a --
9 it's almost as if there's a capture of mineralization at
10 that point. You can quite often, for a few days after
11 that high rainfall, see, again, a high nitrate level
12 then.

13 Then there'd also be -- if you had a fiasco in the
14 field for some reason, that you had some sort of either
15 crop failure or a -- something impacting the crop to the
16 point where there's disease or pests or to the point
17 where the crop really hadn't performed over the year, and
18 you can see high nitrates then.

19 Q So is that a one-time sort of spike that you see or is
20 this a sustained issue that you see?

21 A Those tend to be one-time spikes. The next year you're
22 back down, and you've seen the levels that you 'd hoped
23 to see.

24 Q So are the recommended actions then for the very high
25 FSNT, is that a reasonable recommended action

1 necessarily?

2 A I think they're all reasonable other than the requirement
3 to submit the nutrient budget for that field to the
4 Department of Ecology the next year before you can start
5 applying.

6 And my concern with that one is literally just, you
7 know, not to be rude, but the time that it takes for the
8 bureaucratic wheels to move, the farmer can't produce the
9 budget under this current permit until the spring soil
10 sample is taken.

11 And so that's -- that's the time constraint in its
12 own -- on its own.

13 And then the budget has to be produced and delivered
14 to Department of Ecology, and I can't see how Department
15 of Ecology could make any sort of decision on that
16 without actually going out and seeing the field and
17 talking to the farmer about it, at which point we've got
18 a lot of constraints in the way to getting the crop
19 moving and in and productive for the next year to have
20 the right sort of impact on -- on full soil nitrates
21 without having a very negative impact on cropping.

22 Q So if one of your clients had a field in the very high
23 category for three years, what would that tell you?

24 A That he wasn't listening to the advice he was paying for,
25 that the aim is to be below that, that that's not --

1 Q That would be a highly unusual event?

2 A It would be unusual. It's not what we see. There would
3 be something going wrong there. It would be -- we would
4 need to address.

5 Q So the recommended required actions based upon trends for
6 the very high category, would you say that those are
7 appropriate? That's the very bottom right box.

8 A I think that's appropriate.

9 Q Under Table 3, when you're helping your producers figure
10 out what they're doing with their fall sample soil
11 nitrate, does this table, in your opinion, include the
12 necessary information for you or your producers to
13 understand if they could apply for a -- or how does
14 this -- let me start over. Start that question
15 completely over.

16 How does this table reflect your field budgets for a
17 double crop or a perennial crop?

18 A So this table standalone, the double crop would be an
19 addition to that, but it -- the field would still have to
20 comply with this, from my understanding.

21 So it's not -- the double crop isn't a
22 get-out-of-jail-free card. It's an addition to this.

23 Q So regardless of what you're doing, what you're planting,
24 or what cropping rotation you're using, you're still
25 required under the required actions and the required

1 actions based upon trends based on a fall soil nitrate
2 test sample in the fall, is that correct, per field?

3 A Yes.

4 Q Okay. Thank you.

5 I want to return to T-sum 200 briefly. Just to be
6 clear, does T-sum 200 -- was it designed to work in
7 Eastern Washington?

8 A No.

9 Q And does it work in Eastern Washington?

10 A Not that I've seen. The climate is just so different. I
11 mean, talking about high desert versus a temperate
12 coastal zone.

13 And also the crops like alfalfa that are just -- it
14 was never designed for that sort of crop.

15 Q Okay. And once again, just to make sure we're clear, can
16 your agronomic budget, your field budget, per field, can
17 it account for spring nitrogen loads without a spring
18 soil sample?

19 A Yes.

20 Q Okay. How do your clients fund big infrastructure
21 projects?

22 A Usually by going to the bank or looking for what grant
23 funding is available, or cashier money.

24 Q And what kind of cashier money is available?

25 MS. MATSUMOTO: Objection. This is

1 outside the scope of what's in Mr. Haggith's expert
2 report.

3 MS. NICHOLSON: Again, Mr. Haggith --
4 he helps clients get this sort of funding, so I'm just
5 exploring that so you can understand what it would take
6 to get the funding.

7 JUDGE FRANCKS: I'm going to allow it.
8 I think it goes to the issues in this case.

9 A Well, the big one or the -- there are two main sources
10 through the Conservation Commission and through National
11 Resource Conservation, which is the federal money, and
12 there's some significant sums there.

13 For -- particularly for the federal money, though,
14 you need to have a comprehensive nutrient management
15 plan, which is a different document, again, to the Dairy
16 Nutrient Management Act or the Manure Pollution
17 Prevention Plan that's there under the permit.

18 Q (By Ms. Nicholson) So what's in a comprehensive
19 management plan?

20 A So you have to look at -- you have to do a resource
21 assessment of the entire farm and risk assessment, and
22 it's looking at not just nutrient management but also
23 looking at air quality and all sorts of other
24 environmental issues.

25 And that -- it's part of a holistic system that you

1 basically are required to fulfill all the parts of the
2 comprehensive nutrient management plan, and that includes
3 the Tech Note 23 assessment or lagoons and a requirement
4 to bring the lagoons up to standard.

5 Q And are we talking in particular with -- for NRCS
6 equipped funds? Is that what you're referring to?

7 A Yes.

8 Q And do you help your producers apply for NRCS equipped
9 funds?

10 A I do. That's part of the training I got along the way to
11 produce the nutrient management plans, was through NRCS,
12 and considered a technical service provider with NRCS for
13 farm planning.

14 Q And these NRCS equipped funds, are they in any way
15 limited?

16 A There's a lifetime cap of \$450,000.

17 Q A lifetime cap. So for the lifetime of that producer --

18 A That producer, yeah.

19 Q -- 450 is the maximum they can get?

20 A Yes.

21 Q So if you are applying for NRCS equipped funds and you
22 have already utilized some of that money, say, \$250,000,
23 to build a new lagoon, 200- to 400,000 for a new lagoon,
24 is that, in your -- in your opinion, is that what that
25 costs to put in a new lagoon?

1 MS. MATSUMOTO: Objection. Lack of
2 foundation.

3 A The --

4 JUDGE FRANCKS: I think he can answer.

5 A The lagoons are, yes, in the hundreds of thousands to
6 build. It really just depends on size, depends on
7 location, what sort of material is used to line them.
8 They can get very expensive. They have to be built
9 aboveground completely.

10 Q (By Ms. Nicholson) Okay. So if you have spent a couple
11 hundred thousand on a lagoon, a new one or rebuilt, and
12 you have another big project outlay, all you have left is
13 the balance from the NRCS equipped funds; is that
14 correct?

15 A Correct. I'm working with a few clients at the moment
16 who already have money, say, for separators or pipelines
17 or lagoons, and then they're working on that reduced
18 balance that they can apply for with NRCS.

19 Q And for those equipped funds, anything that is found in
20 the comprehensive management plan that is not to standard
21 has to be fixed with the funds granted too; is that
22 correct?

23 A Yeah. You can fix them with whatever money you can get
24 your hands on, but that tends to be the focus, that you
25 have to bring things up to standard.

1 Q And how easy is it to get NRCS equipped funds?

2 A It's not that easy because you need the plan, and you
3 need to wait in line really. I mean, there's no -- it's
4 not unlimited funding out there, so there's only a
5 certain amount every year that's available.

6 Q So you might not be able to get your full allotment of
7 \$450,000 per lifetime in a single year; is that correct?

8 A Correct.

9 Q Do you know if NRCS equipped funding would be available
10 to retrofit a lagoon that currently meets NRCS
11 requirements?

12 MS. MATSUMOTO: Objection.

13 Mr. Haggith is not an expert in lagoons.

14 MS. NICHOLSON: He's not addressing
15 lagoons. He's addressing the equipped funds and whether
16 it's available.

17 MS. MATSUMOTO: In the context of
18 lagoon retrofitting?

19 JUDGE FRANCKS: Well, I'm going to
20 allow it.

21 A I don't think -- you know, as long as it met the NRCS
22 standard, that's what the funding is there for. I don't
23 believe that they fund above that, if there were other
24 issues that were within -- under the NRCS comprehensive
25 nutrient management plan that seemed to be of higher

1 importance.

2 Q (By Ms. Nicholson) If you're using an agronomic
3 application with your field budget per field, do you
4 anticipate any leaching to groundwater?

5 A The aim of an agronomic application is to apply what the
6 crop needs, with the expectation that the crop is going
7 to take that up.

8 You're applying it when the crop needs it at the
9 level the crop needs. So your assumption is that that
10 would lead to no leaching.

11 Q And, once again, when you are creating a field budget for
12 your clients per field, you are accounting for all of the
13 nutrients for that crop growth year, and does that not
14 include cover crops and perennial crops?

15 A Yes.

16 Q And does that -- so you have planned out, and it includes
17 mineralization. It includes what is residual in the
18 spring, and it includes the crops that will be grown and
19 their nutrient needs; is that correct?

20 A That's correct.

21 Q And so all of that is accounted for in your field budget?

22 A Yes.

23 Q And under Table 3, does that reflect what you're doing
24 with your field budgets then, accounting for the
25 perennial crops and the cover crops?

1 A Yes.

2 Q So under this -- it takes a fall soil sample test in the
3 fall per field?

4 A Yes.

5 Q And requires recommended actions based on that test?

6 A Yes.

7 Q And does it take into account that you're planting a
8 cover crop and that you have accounted for in your field
9 budget already?

10 MS. MATSUMOTO: Objection. This has
11 been asked and answered already.

12 JUDGE FRANCKS: I'm going to allow it
13 because I'm not sure it has.

14 A The problem is, it's really -- at face value, the table
15 is just saying this is high, this is medium, this is low,
16 and it isn't taking into account the fact that there may
17 be a crop growing there.

18 And it really doesn't -- there needs to be
19 explanation of why there is a result in order to really
20 understand what that number means in terms of whether
21 there's a growing crop there, what time of the season,
22 what time of that -- within that sampling period that a
23 sample was taken.

24 Q (By Ms. Nicholson) And would taking into account all
25 that information -- would that be more protective of

1 groundwater?

2 A Yes.

3 Q And why?

4 A Because I think, you know, a 40 or however many part per
5 million soil sample taken in September underneath a
6 growing crop is a very different kettle of fish than a
7 soil sample taken at the end of October on bare soil.

8 Q And you were here all -- not last week, but the week
9 before and listened to the testimony that was presented;
10 is that correct?

11 A Yes.

12 Q And you spend a lot of time on dairy farms; is that
13 correct?

14 A I do.

15 Q Mr. Erickson showed some pictures of lagoons with erosion
16 from a pipe and some questionable line surfaces.

17 Do you recall those pictures?

18 A Yes.

19 Q And are those pictures typical of the lagoons you have
20 observed in the state of Washington?

21 A No.

22 Q And why is that?

23 A Well, part of it is -- under the Dairy Nutrient
24 Management Act, one of the things that's under there as a
25 standard is an operation and maintenance plan in

1 everybody's -- well, for manure storage, for everybody
2 who has manure storage, and that requires that lagoons
3 are maintained in the state that they were designed and
4 built.

5 Q So -- so repairs would be required, is what you're
6 saying?

7 A Repairs are required under the Dairy Nutrient Management
8 plan, repairs and maintenance, and they're inspected
9 every 18 months or so by Department of Agriculture when
10 they do their dairy inspections.

11 Q There has been some testimony on emergency applications
12 of nutrients, and that's in the permit on S4.J.5.

13 And did you want to add a little clarification on
14 emergency applications of nutrients for the board?

15 A I was just -- it came to my mind when it was being
16 discussed earlier, that although the permit allows
17 emergency land application and it cites things like to
18 protect from lagoon failure, you know, obviously it's
19 better to allow some application to some dry fields than
20 to have a lagoon running over.

21 But the thing that wasn't really focused on is the
22 fact that it was -- it doesn't excuse you from any of the
23 other requirements of the permit. That's -- that
24 application would still have to be accounted for in the
25 nutrient budget for that field or those fields for the

1 season.

2 So while it allows this emergency application, it
3 doesn't say, "Well, we allow it, and we forget about it.
4 We allow it, but we include it."

5 You know, it has to then -- it's part of the
6 nutrient application to that field.

7 Q And you testified a little bit earlier about how fields
8 on dairy farms are not necessarily contiguous. They're
9 all over the place and they have different types of soil.

10 Even in the western side of the state that tend to
11 be wetter, can dairy producers find an appropriate field
12 for an emergency application?

13 A Most the dairymen that I'm working with have got, you
14 know -- even in the wettest places of Whatcom and Skagit
15 Counties, they've got somewhere they can go, either by
16 chance or by design, so that if they have a need to apply
17 in the winter, they can find a field that's that little
18 bit higher, that little bit drier, that will take the
19 manure.

20 And under -- certainly under the more recent Dairy
21 Nutrient Management Act plans that have been written or
22 updated, those fields have been identified within the
23 farm plan as being fields that are suitable for winter
24 application.

25 MS. NICHOLSON: Okay. I think we're

1 done.

2 JUDGE FRANCKS: Okay. Ms. Barney?

3 CROSS-EXAMINATION

4 BY MS. BARNEY:

5 Q Good afternoon, Mr. Haggith.

6 A Good afternoon.

7 Q I'm going to ask you to turn to your expert report I-4.

8 Don't put that one away because we'll be going back to

9 the permit, so --

10 A Okay. Got it.

11 Q So starting on Page -- well, starting on Page 2, as

12 Ms. Nicholson took you through, we do have spring soil

13 sample data here. And I guess I just have a couple of

14 questions.

15 Looking at Page 4 at the bottom, sort of four lines

16 from the bottom in that column, do you see where -- let's

17 see -- Farm No. 7 on the 8th of March has a nitrate of

18 14.9, ammonium of 6.9, for a total available of 21.8

19 nitrogen?

20 A Yes.

21 Q And then the line below that, different farm, it appears,

22 but similar numbers in the 20s for the spring sampling?

23 A Yeah.

24 Q Then over to the top of Page 5, again, you know, where we

25 have a total available, sort of bouncing -- top of Page 5

1 is a little different because the ammonium there seems to
2 be the higher contributor to the total nitrogen there --

3 A Yes.

4 Q -- for 24.

5 And then at the very end of those columns, we have
6 some numbers that appear to be getting much higher, and
7 these are samples in June.

8 A Yes.

9 Q Now, I think I heard you describe that some of the farms,
10 you couldn't actually get onto the fields until June --

11 A Yes.

12 Q -- at that point.

13 So are these numbers representative of those where
14 you couldn't get there until later or had nutrients been
15 applied to these?

16 A No. Nothing had been applied to those -- those ones in
17 June. They've just been too wet to apply to, too wet to
18 drive on.

19 Q Okay. Thank you.

20 Did you amend other parts of your expert report
21 other than just adding the data?

22 A Adding the data, yeah, and clarifying, you know, the
23 locations, that's -- those were the --

24 Q Right. That was the only change that you made?

25 A Yes.

1 Q You didn't change any of the other text?

2 A I don't believe -- oh, in terms of just clarifying my
3 conclusions from the data, I think I made some changes to
4 that.

5 Q Could I ask you to look at Page -- let's see. Sorry.
6 Want to get to the right place here. Look at your
7 Paragraph 6, which is on the bottom of Page 8.

8 Do you recall making a change here?

9 A I don't recall making a change there, but since it's
10 based on the spring soil samples, I may well have done
11 it.

12 MS. BARNEY: Because -- well, we can
13 take a look at it. If I may, Your Honor, I've got some
14 copies of the earlier version.

15 Can I distribute those?

16 Q (By Ms. Barney) So I'm looking, in particular there, in
17 Paragraph 6 in the first sentence. I'll just read it out
18 of the copy that I just handed to you.

19 "So more practical and reasonable approach would be
20 to remove the expectation of spring soil sampling in high
21 rainfall areas and base the nutrient budget on the
22 knowledge that there will be a small but significant
23 amount of available nitrogen present in the soil in the
24 spring."

25 And yet in the version that you submitted in March,

1 you took out the word -- you took out "but significant."

2 A Okay.

3 Q And I'm just curious as to why you made that change.

4 A I'm not sure why I made that change.

5 Q So in thinking about the amount of nitrate that would be
6 present in the spring, do you still believe it's possible
7 that that amount can be significant?

8 A I think that that's the whole point of including all that
9 mineralization for the entire season, is that it's
10 happening through the year, and, regardless of the time
11 of that soil sample, some of that mineralization will
12 have shown.

13 I don't think we can discredit that. I think
14 that's, you know -- I think we're seeing what's there.

15 It's -- it's an important -- that mineralization is
16 an important source of nutrient for the crop that can
17 account for the third of the nitrogen that the crop
18 needs.

19 In terms of its implication for our nutrient budget
20 for the full year, whether it's there or not in the
21 spring, we know it's going to be there in some stage
22 during the growing season for the crop.

23 Q And how are you testing your assumptions with regard to
24 the rate of mineralization? Are you measuring
25 mineralization?

1 A Mineralization is one of those things in soil science
2 that people have been trying to grab ahold of for
3 decades, and it's just so difficult to put a handle on it
4 because of climate, because of changing soil types and
5 different crop management practices, that it's very
6 difficult to get a hard-and-fast and numeric equation
7 that we can apply to it.

8 It really has to be done -- the only real way to do
9 it is to look at what you typically see from season to
10 season on that farm or on that type of field
11 historically.

12 Q But wouldn't -- you can't measure total nitrate in the
13 field, though, in the spring?

14 A You can in terms of the implication of total nitrate to
15 what's actually going to be there and available for the
16 crop to use for the entirety of the season.

17 When you're just taking a snapshot in time in the
18 spring, that's where I find that it isn't significant.
19 It is just a snapshot in time in something that's this
20 moving continuum that's much bigger than what we see in
21 the spring.

22 Q Would you be limited to just one time in the spring?
23 Could you sample throughout?

24 A You could sample forever if you have the -- that's the
25 thing is that we can -- we can do -- we can require all

1 of these soil samples throughout the year, and many
2 people do take other samples in the spring.

3 The Pre-Sidedress Nitrate Test was mentioned as
4 being one that we -- that there's some real value to
5 sample then because it's been truthed over years of
6 cropping that, you know, the amount of nitrogen that's
7 available to a crop in the soil right now, you know, has
8 a -- not a straight line, but has a very direct influence
9 on the yield of that corn crop for the rest of the
10 season.

11 So there are definitely cases for taking more soil
12 samples than just a fall soil test.

13 Q In terms of what you've described as field swapping and
14 you also, I think, a little while ago were providing some
15 insight into what types of things can go wrong on an
16 application field, whether there was disease or the crop
17 didn't take for a variety of reasons, and then that
18 leaves you with your fall snapshot sample.

19 If you don't have a spring sample and you're only
20 making assumptions, how do you account for those
21 different things?

22 How do you account for the fact that last year you
23 may have had corn, but this year you have grass or vice
24 versa, if you're not using the data that you're
25 collecting then?

1 A I think on the east side, there's a definite benefit to
2 doing that. You know, the numbers we're seeing, you
3 know, are a big component of what goes into a nutrient
4 budget.

5 I just feel on the west side, the benefit is not
6 there for the cost and the time taken to sample them.

7 Q Okay. And I believe that Ms. Nicholson took you through
8 the Cogger paper, and you are aware that Cogger does say
9 take samples, if at all possible, before October 1st?

10 A Yes. The Cogger paper was also addressing Western Oregon
11 as well as Western Washington, and those other states are
12 significantly earlier than ours.

13 And, yeah, I think, you know, if you got your crop
14 off before October 1st, then that's great, but within
15 that same paragraph, it's saying "prior to significant
16 fall rains," and I think that, to me at least, is the
17 trigger.

18 Q So -- and, well, let's just go ahead and look at that.
19 Cogger is R-12, I believe. Yes. So R is the smaller
20 book, yeah. Thank you.

21 A Is there one more small book?

22 Q Yes, there is. It's another one with a green cover.

23 A Got it.

24 Q On Page 2 at the bottom there, in the second column just
25 underneath the sentence that I just cited about the

1 October 1st date, that paragraph starts off, "Collect
2 samples from medium to fine textured soils prior to five
3 inches of cumulative rainfall."

4 And then the paragraph continues to the top of -- to
5 Page 5 to the top of that column there, "and in sandy
6 loamy other type -- soil types, you're looking to collect
7 samples at three inches of cumulative rainfall."

8 A Yes.

9 Q So when you're talking about your experience in Western
10 Washington, is that based primarily in areas where soils
11 are the medium to fine texture soils?

12 A It's everything we've got. We've got a mixture of soils
13 over here that go from very heavy clays to sandy gravelly
14 piles, so it's -- you know, it's over the mound.

15 Q So the sandy and gravelly types of soils you would want
16 to be collecting for three inches of cumulative rainfall,
17 not five, correct, based on this guidance?

18 A Yes. I think you also have to take into account your
19 cumulative -- not just cumulative rainfall, but use as
20 well because it's not rare to have a September where
21 you've actually got a crop growing in the field using
22 more water than has actually been received by rainfall.

23 We may in some Septembers get as much as three
24 inches of rain, but we've also got crops that can utilize
25 that. And so it's -- even in a relatively wet September,

1 it's not unusual to see fields that, you know, take a
2 one-foot soil probe and find that it's still dry at the
3 bottom inch or two of the probe.

4 Q Mm-hm. Okay. Thank you.

5 So I want to talk for a moment about the ARM, which,
6 again, was application --

7 A Application risk management.

8 Q -- risk management. So back to your report, which is
9 I-4, I see you begin discussing that around Page 17.
10 And, actually, I might have you turn directly to Page 18
11 because that's mostly where I wanted to talk about it.

12 And if I could ask you to have that -- have the
13 permit perhaps where you can refer back and forth, I know
14 it's a bit of a juggling act up there. So, again, the
15 permit is R-2.

16 A Okay.

17 Q So I heard you mention that the ARM program has been
18 published in the Journal of Environmental Quality?

19 A There was an article about it that -- it wasn't
20 specifically about the ARM program. It was also -- it
21 was a consideration of it amongst five others, I believe,
22 that -- from different states.

23 Q Did that article present any data derived under an ARM
24 example?

25 A I don't believe it did.

1 Q Okay. Thank you.

2 A I don't believe it -- yeah. I don't think there was
3 specific data included. I think it was just comments
4 about --

5 Q Okay. If we're looking at Page 18 here, I want to walk
6 through some of these because I'm trying to get a handle
7 on what type of information that you gather to utilize
8 the ARM system that would be incompatible with either
9 T-sum 200 or the permit.

10 A I think that's my point, is that it's not incompatible.
11 I think it's very compatible with the permit in terms of
12 looking at water quality protection.

13 You -- the first step of ARM is, there's a website
14 associated with it with a map of the western side of the
15 state with -- that's linked to normal weather forecasting
16 data and basically colors areas of the western side of
17 the state, either green, yellow, or red.

18 It's this traffic signal approach that you -- a good
19 day to apply or not or one where would apply but apply
20 with caution.

21 And then the request is to go out into the field to
22 assess the crop and assess the field conditions. So
23 it -- also within there, there's a little instruction
24 about how to assess the moisture holding capacity of the
25 soil and how wet the soil is, ask you to dig down to see

1 how deep, you know, the groundwater is in the field.

2 On that day it asks you about the proximity of
3 surface water, asks you to assess the cover the crop
4 gives to the soil.

5 So in terms of a percentage of covers, if you've got
6 a sparse crop that, perhaps, wouldn't let -- wouldn't
7 hold the liquids so well or a dense cover, that would
8 prevent movement so much.

9 Q So are -- all those things you just listed, do you
10 consider those good management practices for any
11 agricultural operation?

12 A I do, yes.

13 Q Would that be something that you would have recommended
14 to your clients prior to that particular ARM program
15 being developed?

16 A It's certainly something that I look at with producers in
17 spring applications and looked at before ARM came along.

18 I think the attraction to ARM is that it includes
19 this very visible weather forecasting tool, and it -- and
20 it gives us some sort of semi-formalized approach to
21 going down the checklist of, "Have you done this, this,
22 and this?"

23 Q In terms of -- well, you had mentioned that you were here
24 for two weeks ago during the hearing.

25 A Yes.

1 Q Did you -- do you recall hearing anything about the
2 Manure Pollution Prevention Plan?

3 A Yes.

4 Q As a site-specific way that a particular operator would
5 customize their management practices to address and meet
6 the conditions in the permit?

7 A Yes.

8 Q So, again, that list that you enumerated for us, would
9 those be the types of things that you would recommend
10 someone to include in such a plan?

11 A They could include it in the plan, yes.

12 Q Okay. Oh, you mentioned the depth to water table. I
13 think we had some conversation about that.

14 In your experience in Western Washington, is the
15 depth to water table at a dairy or land application site
16 difficult to ascertain?

17 A Takes a shovel and a little bit of time to dig down in
18 terms of -- that's an oversimplification. It's a very
19 site-specific thing.

20 Q Mm-hm.

21 A Digging down the first couple of feet with a shovel is a
22 piece of cake.

23 What the ARM program is looking at is trying to make
24 sure that you have a decent depth to groundwater, that
25 you're not -- once they -- depth down and finding you've

1 got that level of saturation in the soils.

2 Generally, I give up digging when I get down to
3 about three feet. It's -- yeah. So it's not unusual to
4 have one field on one farm have, you know -- be within a
5 foot or so of groundwater and in other fields that you
6 can dig down three feet and not find anything.

7 Q Thank you.

8 If I could ask you to look at the permit at Page 21,
9 so R-2. So I'm looking in Section 3D, the application
10 restrictions.

11 A Yes.

12 Q They start there on 21. Again, some of these are
13 starting to sound familiar from your list in terms of not
14 applying to fields with saturated soils, if the water
15 table is within 12 inches of the surface, precipitation
16 forecast.

17 Seems to be very similar with some of the factors
18 that you named off for us.

19 A Yes.

20 Q Okay. In terms of your conversation about the adaptive
21 management table, is it your understanding of the permit
22 that the adaptive management actions that this table
23 stands alone to direct a producer or does it work with
24 the rest of the permit?

25 A I think it -- I think it stands alone in terms of

1 interpretation of the soil test. I think the other parts
2 of the permit, such as emergency winter application or
3 the cover cropping, double cropping scenario, sort of an
4 addition to that, but they don't sort of excuse you from
5 this. It doesn't act as that.

6 Q Okay.

7 A At least in my reading of the permit.

8 Q Mm-hm. Okay. And, again, in looking at -- when you're
9 proposing to use the fall -- the results of fall soil
10 sampling without a spring soil sample, how are you
11 accounting for the changes -- how are you, first of all,
12 incorporating the fact that, say, "This year say we had a
13 soil sampling rate of 35, so we're in the high area"?

14 Do you take that information into account when
15 you're putting your budget together?

16 A That, together with what was the production of the crop
17 through the year. Are there reasons -- you know, what
18 are the reasons we got to that level? Yeah. And then
19 taking that into account.

20 I mean, if it's a field and we've been
21 under-accounting for mineralization, we need to -- we
22 need to, you know, address that or if there have been
23 yield factors or quality factors that have affected that.

24 Q So how would you determine -- since you said that that
25 quantifying mineralization was still elusive, how do you

1 determine that you have maybe under-accounted for
2 mineralization or over-accounted for it?

3 A Well, one of the things that's required under the permit
4 and under the Dairy Nutrient Management Act is that you
5 keep a record of what you apply to a field during the
6 year.

7 So in a way, it's -- it's the reverse of the
8 budgeting process: What have we taken off the field?
9 What's the nitrogen that has been pulled off the field in
10 the year? Maybe what has been locked up and tied up in
11 establishing that perennial crop?

12 But then subtracting out what did we apply and did
13 we apply too much because now we have what's left is --
14 has come from the soil. And have we -- did we not
15 account for enough mineralization?

16 And, you know, that's a very field-specific thing.
17 Yes, it will change from year to year, but it also
18 changes from field to field, so maybe moving forward, we
19 should be accounting for 20 percent extra or
20 mineralization for a future year, especially if we're
21 getting high numbers as a result.

22 Q And when you're putting together a field budget and
23 calculating -- well, the permit uses the term application
24 rate, but to go to the term that Ms. Nicholson asked you
25 about, your agronomic rate, is your primary goal at that

1 point maximum yield for the crop?

2 A It tends to be -- it's not specific -- it's not always
3 maximum yield. I mean, yes, farmers tend to like to get
4 the best they can out of their fields, but there's also a
5 quality aspect to that.

6 And there may be -- there may be other parameters.
7 I mean, in years like this, where people aren't making a
8 lot of money dairy farming, they don't want to be going
9 out and spending a lot of money on commercial fertilizer.

10 So the aim is not what's the -- what's the maximum
11 yield we can achieve. It's more, what's the best we can
12 achieve with what's sitting in our lagoons and our dry
13 stacks.

14 Q And I believe I heard Ms. Nicholson ask you if you
15 believe that the ARM program was protective of
16 groundwater and surface water.

17 A Yes.

18 Q And your answer was?

19 A I believe it is, yeah.

20 Q And yet I haven't heard you speak about groundwater in
21 relation to that.

22 We looked at some data with regard to shellfish beds
23 and surface water, but what do you base your opinion on,
24 that it's protective of groundwater?

25 A Well, we've been talking about the Blaine-Sumas Aquifer,

1 and I'd always known it as the Abbotsford-Sumas Aquifer.
2 A big chunk of it sits under Canada as well.

3 And there was a cross-border symposium years ago
4 about groundwater, and there was some very clear
5 indication there from hydrogeologists that the -- what
6 they call the age of the groundwater there was -- they
7 said between -- I think the number that comes to mind was
8 16 years and that the -- putting into place practices
9 today would need to be a continuation of those practices
10 of over many years to see the groundwater impacted, that
11 it would take years of following these standards.

12 So as a result, Department of Ecology had been
13 sampling these wells in the Sumas-Abbotsford Aquifer for
14 years.

15 And the latest study that's come out of there is
16 showing that, sure enough, as was expected, that the
17 numbers are slowly improving.

18 Q And what study is that?

19 A That was -- it was a Barb Carey survey of water in the
20 Abbotsford-Sumas Aquifer. It was data that's been on the
21 EIM site -- the ERM, the Ecology data repository. All
22 that well data is in there, and she produced a summary of
23 that data last spring, I think.

24 MS. BARNEY: Okay. Thank you. Just
25 taking one last look.

1 JUDGE FRANCKS: Okay. Ms. Matsumoto?

2 CROSS-EXAMINATION

3 BY MS. MATSUMOTO:

4 Q Hi, Mr. Haggith. We met at your deposition. Nice to see
5 you.

6 I have a few questions for you.

7 You mentioned that you work for N3 Consulting;
8 correct?

9 A Yes.

10 Q And who are your other partners with N3?

11 A Well, we started out with four of us. Nguyen Matthews,
12 who subsequently left us to go and head up the CAFO
13 program down in Oregon for Oregon Department of Ecology;
14 Joy Holly, who subsequently left us to go and work for
15 NRCS in Whatcom County; and Fred Likkell, who has now gone
16 part-time.

17 Q And Mr. Likkell also is affiliated with the Washington
18 State Dairy Federation; isn't that correct?

19 MS. NICHOLSON: Objection. Relevance.

20 MS. MATSUMOTO: There is an appellant
21 here today, and it's a partner that Mr. Haggith has
22 worked with.

23 A Yes. We did some --

24 MS. NICHOLSON: No. You wait until
25 she's --

1 JUDGE FRANCK: I'm going to sustain
2 the objection. I'm not sure that we need the
3 associations of a partner who's not involved in this.

4 So with that, you can move on.

5 Q (By Ms. Matsumoto) Mr. Haggith, we've already discussed
6 somewhat your updated report and some differences between
7 your initial and updated report.

8 And just to get the timing correct, you had
9 submitted this initial report and then we had a
10 deposition.

11 Do you recall about how much time we spent in
12 deposition?

13 A Four hours or so, yes.

14 Q Mm-hm. And then you produced your updated expert
15 opinions, correct, following the deposition?

16 A Yes.

17 Q Ms. Barney pointed out some changes beyond just the
18 addition of data, and I'd like you to look at your
19 initial report, just the executive summary Item A. And
20 that is Exhibit R-28.

21 A Okay.

22 Q And the last sentence ends with the phrase "otherwise
23 reasonably simple process." And if we -- do you see
24 that?

25 A Yes.

1 Q Okay. If we compare that to your updated report,
2 Exhibit I-4 --

3 A Yes.

4 Q -- I noticed you added an additional clause at the end of
5 Paragraph A there that includes the phrase "protective of
6 groundwater"?

7 A Yes.

8 Q And do you recall if that's the first time you've ever
9 used that phrase in the context of your expert opinions?

10 A No. I don't recall.

11 Q Okay. Would it surprise you to learn that this is the
12 first time that that phrase has appeared and it didn't
13 appear in your initial report?

14 A I don't think it would surprise me, no. I don't think
15 so.

16 Q And is it -- but is it still your opinion that the only
17 changes from your initial to the updated report centered
18 around just the data?

19 A I mean, what I was trying to achieve was some
20 clarification on a -- seemed to be around this data and
21 this whole idea of the spring soil sampling because that
22 was where a lot of questioning went in the deposition.

23 And I felt that I didn't come off particularly clear
24 in the deposition in my conclusions and my thoughts
25 there. And, you know, just leaving that sentence as it

1 was with the variations in soil sampling complicating an
2 otherwise reasonably simple process, well, you know, who
3 really cares whether it's complicating a simple process?

4 I think that the point is more that we're trying to
5 protect groundwater with the permit and trying to see if
6 there's actually a point of spring soil sampling in terms
7 of protecting groundwater.

8 Q And so you agree that's an important goal of having the
9 permit is water quality?

10 A Oh, yeah. Well, that's what the permit is about, yes.

11 Q Looking at your data set, in the notes column, there are,
12 it looks like, four entries that have a note that says
13 "not CAFO."

14 Do you see those?

15 A Yes.

16 Q And the highest one, I believe -- or if you look at
17 Page 4 -- and let me back up just a second.

18 Is it correct you've organized these in terms of
19 lowest to highest spring soil nitrate level?

20 A Spring soil available nitrogen level, yes. Combination
21 or an addition of nitrate and ammonium.

22 Q So we can see the first data point starts at 3.8, and it
23 goes all the way up to 33.1 in ascending order; correct?

24 A Yes.

25 Q And so the sample that the data point on Page 4 that says

1 "not CAFO" has a spring soil available nitrate level of
2 13.9?

3 A Yes.

4 Q And the other three samples that are not collected from
5 the CAFO have spring levels that are less than that;
6 correct?

7 A Yes.

8 Q And looking at Paragraph 4 of your report, Ms. Nicholson
9 was asking you some questions with the visualization of
10 these samples broken out into bar graphs.

11 And you had referenced in Paragraph 4, 20 milligrams
12 per kilogram of available nitrogen sort of cutoff.

13 Do you see that in Paragraph 4 towards the end of
14 the paragraph?

15 A Yes.

16 Q And so including these four samples not collected from a
17 CAFO means that you have four additional data points that
18 are below 20 milligrams per kilogram; correct?

19 A Yes.

20 Q So you've selected to include those results in a way that
21 favors your conclusion?

22 MS. NICHOLSON: Objection.

23 Argumentative.

24 A Well, four --

25 JUDGE FRANCKS: I'm going to allow it.

1 A Four out of almost a hundred. Yes. I've included them.

2 One of the things that was being angled at during my
3 deposition was that it wasn't a complete data set, and
4 these are all the soil samples I took.

5 Q (By Ms. Matsumoto) But those four that were not
6 collected from a CAFO, it appears that they skew the
7 results to favor the conclusion of having a majority of
8 samples under 20 milligrams per kilogram in the spring?

9 MS. NICHOLSON: Objection.
10 Argumentative.

11 JUDGE FRANCK: I'm going to sustain
12 that one.

13 Q (By Ms. Matsumoto) Mr. Haggith, you would agree that,
14 for all of the data points that you have included in your
15 table, when you have a fall sample to compare it to, it
16 would give you or the producer a better understanding of
17 how their system behaves; isn't that correct?

18 MS. NICHOLSON: Objection. Misstates
19 testimony.

20 JUDGE FRANCK: Can you rephrase?

21 MS. MATSUMOTO: Yes.

22 Q (By Ms. Matsumoto) Don't you find it useful to be able
23 to look at samples collected from the same field year
24 over year -- over time so that you can get an
25 understanding of how the field works?

1 A Yes. I think yes.

2 Q And so that would include having past samples from that
3 field, fall samples, samples from a year ago in the
4 spring, whatever you have to look at?

5 You would agree that that's informative to the
6 farmer to get a better understanding of how their field
7 is functioning?

8 MS. NICHOLSON: Objection. Misstates
9 testimony.

10 JUDGE FRANCKS: I think he can answer
11 that.

12 A I think a soil sample is -- it's a snapshot in time. It
13 gives you an idea of that nitrogen concentration in the
14 soil on that day without other information in terms of
15 the cropping, that it has limited -- it has limited
16 value.

17 Q (By Ms. Matsumoto) And so if a person has just a spring
18 sample or even just a fall sample in isolation, would you
19 agree that they don't have as clear of a sense of how
20 their field and their cropping is functioning on that
21 field as someone who had, let's say, three or even five
22 years of regularly collected spring and fall soil
23 samples?

24 MS. NICHOLSON: Objection. Compound.

25 JUDGE FRANCKS: I think he can answer

1 it.

2 A I think all these soil samples are aimed at different
3 things. The fall soil sample is -- as I said earlier,
4 it's described by many as being that report card test
5 that you're showing how you've performed in the year
6 against that budget, how well that manure has been used
7 as a fertilizer source, as a feed source for the crop.

8 The spring soil sample has none of that history
9 because it's -- it's -- you're coming out of the winter.
10 The point of including this data set was to show really
11 there's nothing like the variation in the spring that
12 there is in the fall.

13 And I think, you know, that spring clean of non-CAFO
14 fields through the -- through -- within this CAFO
15 information just goes to strengthen that argument.

16 Q (By Ms. Matsumoto) So you -- it's your testimony that
17 there is greater variation in fall soil sampling than
18 there is in spring; is that correct?

19 A There's a greater level of variation, and there are a
20 greater number of environmental and human factors that go
21 into that variation.

22 Q And looking at this data set, it appears that there are
23 quite a few gaps for fall soil samples. Many of these
24 data points are actually lacking that fall data.

25 So where are you -- from what information are you

1 reaching that conclusion?

2 A From which conclusion?

3 Q That there's more variation in the fall soil sampling
4 when it appears that a significant percentage of these
5 data points don't actually have a fall soil sample to
6 reference.

7 A The fact that there is -- you know, I'm basing that on of
8 many years of experience of taking these fall soil
9 samples and spring soil samples that there's great
10 variation, and there's, you know, good number of
11 different cropping reasons that lead to that.

12 Q Do you know how many of these data points do not have a
13 fall soil sample included?

14 A I don't.

15 Q Do you know how many total data points you included in
16 your summary?

17 A I believe it's 117.

18 Q Would you accept my representation that it's 125?

19 A If you say so, then -- I haven't counted them recently,
20 but yeah.

21 Q I think, if you were to count them, that's about the
22 number you would reach.

23 And similarly, for the gaps for fall soil samples,
24 approximately 47 appear not to have a corresponding fall
25 soil sample.

1 Why isn't there a fall soil sample listed?

2 A I just didn't have it at the time.

3 Q So you don't know if a fall soil sample was taken and
4 just not included or --

5 A Correct.

6 Q -- if there's some other explanation?

7 A They may well have been taken and -- but not by me. I
8 didn't -- otherwise, I would have included the numbers.

9 Q And you've talked a bit about mineralization as being
10 kind of the primary driver for available nitrogen in the
11 spring; is that correct?

12 A Yes.

13 Q Okay. And you would agree, though, that whether the
14 nitrogen that's available in the spring results from
15 mineralization or some other reason, it's still available
16 to the crop; correct?

17 A Yes.

18 Q And so because it's crop available, it's important to
19 account for it in the nutrient budget?

20 A It's -- my previous testimony was that, you know, it's
21 part of that mineralization within the soil, yes. The
22 mineralization should be accounted for in the nutrient
23 budget.

24 Whether it's occurred by the time you get into the
25 field to take the soil sample or not is -- is academic.

1 It doesn't change the fact that mineralization is
2 occurring. I don't think you can reduce or increase your
3 estimation of mineralization for the year based on that
4 sample.

5 Q And some of these samples also in the crop column do not
6 appear to have a crop listed.

7 Is it correct that, if it says "none" in that
8 column, it means there was no crop planted over the
9 winter?

10 A Yes.

11 Q And I'd like you to look just at Page 4, about two-thirds
12 of the way down. There are three samples collected in
13 Skagit County from farm identified as No. 4 and then in
14 the field column listed 4, 6, and 7 taken -- all taken on
15 April 28th.

16 Do you see those?

17 A Yes.

18 Q Right. And they don't appear to have had a crop planted
19 over the winter; correct?

20 A Yes.

21 Q And when you look at the fall soil result, each of the
22 three appears to have a fall soil result included.

23 That number is higher than the available spring
24 nitrogen result; correct?

25 A Yes.

1 Q And as you've already testified, nitrate is -- there's a
2 risk that nitrate can be lost once -- if it's not taken
3 up by the crops?

4 MS. NICHOLSON: Objection. Misstates
5 testimony.

6 JUDGE FRANCKS: I'll let him answer.

7 A Sorry. Can you --

8 Q (By Ms. Matsumoto) Sure. Well, we talked a lot about
9 plants using nitrogen, and Ms. Nicholson kind of walked
10 you through Table 3, and you mentioned some risks.

11 And I think one of the risks you mentioned was that
12 nitrate that isn't taken up by the crops could
13 potentially move down to groundwater; is that correct?

14 A It's one of the things that can happen with nitrate,
15 yeah, amongst others, yes.

16 Q Okay. And if you see a fall soil sample taken from a
17 field that is higher than a spring soil sample, taken
18 from that same field in an area where a high
19 precipitation is known to occur, one possibility is that
20 the difference in those two numbers could represent the
21 amount that's being leached down to groundwater; isn't
22 that correct?

23 MS. NICHOLSON: Objection. Compound.

24 JUDGE FRANCKS: I think he can answer.

25 A I think there are, you know, a variety of different

1 potential reasons why it's reduced over the winter.

2 Q (By Ms. Matsumoto) But I'm just asking about this one --
3 this is one possibility; correct?

4 A This is -- it's certainly moved out of the top foot.
5 Whether it's leached all the way down to the groundwater,
6 that's -- refer to previous testimony on that. I'm not a
7 hydrogeologist.

8 Q If -- when it moves out of the top foot, it's moving past
9 the root zone, then there is a high risk that it is
10 moving into the groundwater; correct?

11 MS. NICHOLSON: Objection. Been asked
12 and answered.

13 JUDGE FRANCKS: I don't think so.

14 A I think limiting the root zone of a crop to the top foot
15 is unfair. The crop roots go a lot deeper than just one
16 foot.

17 So, you know, if it drops out of the top foot, it
18 still may well be accessible to crop rooting.

19 Q (By Ms. Matsumoto) If it continues to drop such that
20 it's past the root zone, you would agree that it could
21 reach the groundwater; correct?

22 A I -- again, whether it reaches groundwater or not is not
23 my area of expertise. I would leave that to a
24 hydrogeologist.

25 Q But you --

1 A Touched on that in his testimony with far more experience
2 and knowledge than I ever could.

3 Q Your new report adds the phrase "protective of
4 groundwater," and just a few moments ago you mentioned
5 that that was an important function of this permit, was
6 protecting groundwater, so --

7 A Yes. And I believe that, if we're applying it at an
8 agronomic rate and we're applying to crops such that they
9 can take up what they need and not overapplying, that we
10 are protective of groundwater.

11 And I believe that that's borne out with, you know,
12 this sort of water quality data we're getting from
13 Ecology on the Sumas aquifer.

14 Q But you agree nitrate is soluble and moves with water;
15 correct?

16 A Yes.

17 Q And so there is a risk that, if nitrate is moving with
18 water and it moves past the root zone, that it will
19 eventually reach the groundwater; correct?

20 MS. HOWARD: Objection. That's been
21 asked and answered.

22 MS. MATSUMOTO: I don't think I got a
23 clear answer on the question.

24 JUDGE FRANCK: I think he can answer
25 it.

1 A I think there is a -- there is a risk. Whether it
2 actually happens or not, I can't answer that.

3 Q (By Ms. Matsumoto) Thank you.

4 You mentioned that there has been an increase in
5 cover crops in recent years. I believe Ms. Nicholson was
6 asking you some questions about Table 3 and the permit
7 requirements for cropping and perennial crops?

8 A Yes.

9 Q Do you remember that? Isn't one reason for having a
10 cover crop so that a farmer can deal with excess manure?

11 MS. NICHOLSON: Objection. That
12 misstates testimony.

13 MS. MATSUMOTO: It's just a question.
14 I'm not trying to rephrase the testimony.

15 JUDGE FRANCKS: He can answer that
16 question.

17 A No. The thought behind cover cropping -- cover cropping
18 has huge advantages all over the nation and is being
19 promoted by just about anybody who has anything to do
20 with cropping from the society of agronomy to NRCS and
21 conservation districts because of its assistance in
22 holding soil on fields where there's erosion and, in the
23 case of our situation, in capturing nutrients that are
24 there in the fall and utilizing them.

25 It generally -- in terms of nutrient budgeting and

1 nutrient management, developing of nutrient management
2 plans, there's some fairly big discussions about whether
3 those cover crops should actually be accounted for in
4 nutrient budgeting, whether they should be just in
5 addition to the existing system.

6 So they're not used -- you talk about excess manure.
7 The dairy nutrient management plans -- the MPPPs are all
8 asking you to make sure your crops are in balance with
9 the level of nutrients that you have on the farm.

10 So, you know, excess manure is not what the cover
11 crops are there for. They're there to help stabilize the
12 soils and help produce more food from the nitrogen that
13 you've got available to you in the manure.

14 Q (By Ms. Matsumoto) They can still perform that function,
15 though, correct, of being a way for excess manure to be
16 used in some way that's not just simply being stored in
17 the ground?

18 A It's rare that you see people applying to cover crops in
19 the fall. Generally, they're established. They may be
20 manured in the spring or fertilized with commercial
21 fertilizer in the spring in order to bring them to a
22 fully healthy harvest.

23 But, you know, if you're suggesting they're a
24 dumping ground for this excess manure, I don't believe it
25 exists. I don't think that's the case.

1 Q You don't believe that farmers struggle with issues of
2 excess manure?

3 A I -- it -- the whole dairy nutrient management planning
4 process is about making sure there's a good balance of
5 crops and crop needs to the nutrients in the lagoons.
6 The vast majority of clients I work with are having to
7 buy fertilizer to round off that balance.

8 You know, the cows eat an awful lot of food, but
9 they need a lot of crop ground to feed them. Manure is
10 part of that system.

11 Q And most of your clients, you said, are dairy farmers?

12 A Yes.

13 Q And do you know how many that is in terms of the number?
14 Did you mention that earlier?

15 A I don't think I did mention that earlier, but -- I should
16 have tallied it up, but it's more than 60.

17 Q And have you spoken with many of your clients about
18 pursuing coverage under the CAFO permit?

19 A Yes. Yes.

20 Q And isn't it true that most of them are not interested in
21 pursuing coverage under the permit?

22 A There's a stumbling block, and part of the stumbling
23 block is this appeal and why would you sign up for
24 something when you don't know what it looks like.

25 You're signing -- you're signing on to a serious

1 document when you sign up for the CAFO permit, and it has
2 some far-reaching implications, and cost of implementing
3 it are not insignificant.

4 For some, it comes down to a decision of, well, do
5 we apply for the permit? Can we afford to apply for the
6 permit? Do we retire?

7 It is -- if you've got a dairyman in his 50s who's
8 got nobody from the next generation to follow him on and
9 kind of feeling in his heart like it's a good pursuit for
10 his sons and daughters to follow, then he's looking at --
11 you know, if he's backed into a corner and has to fulfill
12 the requirements of the permit and that means rebuilding
13 lagoons with the cost of hundreds of thousands of
14 dollars, then he's going to sell the herd and move on.
15 It's not worth that level of investment.

16 Q How many of your clients are applying commercial
17 nitrogen?

18 A Quite a lot. Can't give you an exact number, but I'd say
19 that at least -- at least 50 percent are buying in some
20 level of commercial fertilizer to -- you know, to finish
21 off and round up their nutrient applications.

22 Q And that's at least 50 percent of your dairy clients?

23 A Yes.

24 Q And are you recommending that they apply commercial
25 fertilizer?

1 A When they need to. I mean, if they haven't got enough
2 nutrients in their manure, then, you know, the decision
3 then is, well, do you short your crop? Do you accept
4 that you're going to get less yield or do you invest in
5 some level of commercial nutrients to improve that?

6 We've also got, you know, organic dairy clients, and
7 in more cases than not, they're growing some of the
8 vigorous looking grass because they can't get their hands
9 on commercial fertilizer, and actually getting their
10 hands on organic manure sources that have any decent
11 level of nitrogen in them is very difficult.

12 Q You talked a little bit about the nutrient budget
13 process.

14 Do you recall that?

15 A Yes.

16 Q And if you look at Table 3, either right there behind you
17 or we can pull up Exhibit R-2 permit.

18 A Yep.

19 Q Okay. And you had some concerns about you referenced
20 kind of the bureaucratic nature of having nutrient
21 budgets approved by the Department of Ecology?

22 A Yes.

23 Q But that's -- if you look at Table 3, not a requirement
24 in all cases, is it?

25 A No.

1 Q So it's only in the limited instance where a fall soil
2 nitrate test is at -- is above 45 parts per million;
3 correct?

4 A Correct.

5 Q And so in that situation, you wouldn't recommend that an
6 operator apply in that case anyway, would you?

7 A The nutrient budget is for the following year, so, yes, I
8 would put together a nutrient budget that would look at
9 the crop needs for that year and where those needs were
10 going to be met from.

11 I can see Department of Ecology's thinking that
12 they'd like to see those budgets, and undoubtedly those
13 probably need more scrutiny than ones from the fields
14 that are -- that have lower nitrate, but I -- I think to
15 have to wait in order to implement that budget, that's my
16 issue there.

17 I think the budget needs to be crafted carefully,
18 and it needs to be crafted looking back at that prior
19 year and what led to that high level of nitrate in the
20 fall.

21 So that's -- so I'm not saying we shouldn't be
22 accounting for that. I'm saying that we should be very
23 careful but that I don't think that that -- that holdup
24 and the reduction in yield that can follow from such a
25 holdup is helpful.

1 In fact, quite the opposite. If we're getting less
2 yield off a field, then we're going to -- and we don't
3 reduce the amount of application, we're going to see high
4 nitrates. And if we start doing this too much, it's
5 going to be a spiral downwards.

6 So I think it's something that's -- needs to be
7 addressed carefully, but stalling the process of
8 management in that field is not good.

9 Q But that's only in the very high field risk level, which,
10 you would agree, ideally is not the target risk level;
11 correct?

12 A It's absolutely not the target risk level, but there are
13 reasons why it would happen in a year, and it's not
14 necessarily through deficiency of a nutrient budget. It
15 could very well be through climatic factors or disease
16 factors within that field for that year.

17 And something that needs to be accounted for
18 undoubtedly and is accounted for in those end-of-year
19 reports that are submitted by December 31st.

20 They have to account for every field that has come
21 up with a very high soil test number. So you're already
22 going through the thought process, and Ecology has
23 already been notified of that being a high field and of
24 the -- your reasoning behind that.

25 So they've had the information. They've got the

1 ability to address those issues and talk with you about
2 it before you even start to put a budget into place the
3 next year.

4 So I think then stalling the whole process around
5 budgeting and, therefore, impacting crop yield as a
6 result, I think, is unnecessary.

7 Q But as someone who advises farmers on those four R's you
8 mentioned, right place, right time, it would be your
9 hope, would it not, that a farmer finding him or herself
10 in that category would be the exception rather than the
11 rule? Correct?

12 A I would -- yes. Yeah. We -- that would be the aim.
13 We're not aiming for those sort of levels of nitrate in
14 the fall.

15 Q Right. And the accompanying required actions in the
16 adaptive management table; right?

17 A Yeah.

18 Q Right. You also spoke a bit about winter manure
19 applications and that you would hope that they would be
20 applying to dry fields. Is that what you said earlier?

21 A Yes.

22 Q And that's because having applications on saturated or
23 frozen fields create risks of runoff; correct?

24 A Correct.

25 Q Are you aware or have you ever been involved in

1 responding to any instances of significant runoff that
2 resulted from an emergency application or other emergency
3 winter condition?

4 A Emergency -- yes. I've been involved in follow-up from
5 those sort of events, yeah. Yes.

6 Q And what were those? Can you remember any specific
7 examples?

8 A When you get -- well, a winter like the winter of 2016 to
9 '17 where we got more than a year's worth of rainfall in
10 five and a half, six months of winter storage season --
11 so people were absolutely crammed to the top of their
12 lagoons -- there were -- there were a lot of people who
13 were looking for where could they go with the manure to
14 make sure they didn't have lagoons running over and make
15 sure they weren't impacting surface water.

16 Q How about other examples prior to last year?

17 A I think there have been events, yeah. There have been
18 times when emergency application -- the reason I think
19 that it's written into the permit is, it happens, and it
20 has to be accounted for.

21 Q About how many have you been involved in responding to?

22 A I have no idea off the top of my head. Yes.

23 Q Did you ever work with the Snook Brook facility in the
24 context of dealing with an emergency winter application?

25 A No.

1 MS. NICHOLSON: Objection. Relevance
2 to the permit terms.

3 MS. MATSUMOTO: There are -- there's a
4 whole section of the permit dealing with emergency winter
5 applications, and Mr. Haggith's response indicates he's
6 familiar with the name.

7 MS. NICHOLSON: But now they're
8 talking about a specific dairy.

9 JUDGE FRANCKS: Yeah. I think this is
10 beyond the relevance of the permit.

11 Q (By Ms. Matsumoto) Mr. Haggith, you were asked about, in
12 the context of Table 3, kind of a hypothetical that
13 Ms. Nicholson offered about one of your clients being in
14 the very high range for three consecutive years, and you
15 said something like, "I think he wasn't listening to my
16 advice."

17 Do you recall that?

18 A Yes.

19 Q And have you actually had clients who have tested in the
20 very high range that's above 45 parts per million or
21 above 165 pounds per acre in the same field for
22 consecutive years?

23 A Yes.

24 Q And what advice have you given them in those situations?

25 A Well, advice I give them. Our focus has been on what's

1 the crop and what are we trying to achieve there and
2 what's the soil capable of achieving? Because clearly it
3 isn't achieving what's been happening.

4 As part of what we do with several of the dairies
5 is, we put together records of what's been applied to a
6 field. In those sort of situations, we start to look at
7 them really quite closely and as does Department of
8 Agriculture and their inspectors.

9 Those are the fields that they look at most closely
10 are the fields that are over 45 parts per million in
11 terms of what's occurred with the nutrient balance.

12 So the recommendation is, you know, flow from that,
13 is it time to reseed the grass field? Is it just not
14 producing what we thought it would be producing? Is
15 it -- is it time to be backing off further on manure
16 applications or on commercial fertilizer applications?

17 Are the times just wrong? You know, what's --
18 what's been happening in the field? So it's a big
19 question. Sometimes the answers are simple. Sometimes
20 it is just, "Let's apply less and see what happens."

21 But sometimes it does take, you know, some
22 significant investment in reseeding a field or
23 sub-soiling a field or making some other large changes.

24 Q And one of the other things you might consider is kind of
25 the climate and whether they're in Eastern or Western

1 Washington; is that correct?

2 A That would factor in as one of the factors, yes.

3 Q And you worked for dairies on both sides of the state;
4 correct? Eastern and Western Washington?

5 A Yes.

6 Q And in Eastern Washington, you worked for Dan DeRuyter at
7 one point. Is that the --

8 MS. NICHOLSON: Objection, Your Honor.
9 Relevance.

10 MS. MATSUMOTO: We've already talked
11 about the DeRuyter dairy in the past week that we've been
12 here. And it's a specific example.

13 Mr. Haggith has already used many, many data sets
14 from his particular clients without giving us any
15 identifying information as to who they were, but we have
16 the opportunity to look at some real-life identified
17 information about a client that Mr. Haggith has advised
18 in the past.

19 JUDGE FRANCKS: And what -- but what's
20 this relevant to in our issues?

21 MS. MATSUMOTO: Table 3 and
22 Mr. Haggith's prior testimony about recommendations he
23 may or may not make.

24 JUDGE FRANCKS: I think this is beyond
25 the relevance. I don't think his advice to a particular

1 client is relevant to the permit here.

2 MS. MATSUMOTO: To the extent that
3 they inform his opinions about whether the permit terms
4 are adequate enough, he's already said that, you know,
5 his own experience being on many dairy farms in the past
6 has informed the basis for some of these opinions.

7 JUDGE FRANCKS: I think it's beyond
8 the relevance.

9 MS. MATSUMOTO: And Mr. DeRuyter's
10 performance has already been testified about, and this
11 goes to Mr. Haggith's credibility and his role as an
12 advisor to that facility.

13 JUDGE FRANCKS: I think -- I still
14 think it's beyond the relevance of the issues that are
15 before the board today.

16 MS. MATSUMOTO: One moment. Just for
17 the record, I'd like to make an offer of proof that, if
18 we were allowed to further explore this area of inquiry,
19 we'd be able to present the board with a little bit more
20 information about Mr. Haggith's expertise and his
21 credibility as someone in this particular field.

22 And that is it for me.

23 JUDGE FRANCKS: Okay. Ms. Nicholson,
24 redirect?

25 ////

1 REDIRECT EXAMINATION

2 BY MS. NICHOLSON:

3 Q I just have one quick redirect question, Mr. Haggith.

4 Over the course of your career, how many fall soil
5 samples have you taken, do you think? Just a rough
6 estimate.

7 A Ten to fifteen thousand.

8 Q And are your opinions about fall soil samples based on
9 those 10- to 15,000?

10 A Yes.

11 MS. NICHOLSON: Thank you. That's it.

12 JUDGE FRANCKS: Board questions? Who
13 wants to go first? Mr. Wise?

14 EXAMINATION

15 BY MR. WISE:

16 Q Good afternoon. I just had one question.

17 Now, when you're doing your field budgets and trying
18 to figure out the agronomic rate and all that, how
19 confident are you that you're hitting the mark?

20 I mean, do you have any way of -- do you do any
21 follow-up to verify that you're putting the right amount
22 of fertilizer on to not overwhelm the plant uptake?

23 A Yes. It's a factor of history really. We look at what
24 the fields -- how the fields have been performing in the
25 past. We also look at -- when we've done that whole farm

1 balance, we know we're in the ballpark.

2 And so then working from field to field, need to
3 take into account field history in order to put that into
4 place, and then you need to follow up.

5 That Pre-Sidedress Nitrate Test I was talking about
6 earlier that's on the corn crops, at least that's a good
7 opportunity to take another soil test and say, you know,
8 "How well have we done in feeding the crop to this
9 point?"

10 And then you also look at that fall soil test result
11 to say, "Did we meet the mark? Did the plant take up
12 what we gave it?"

13 And it's -- so it -- the first year that you're on a
14 new farm with a new client, it's a bit more difficult
15 because you working with information -- with limited
16 information.

17 But once you get a few years into the process, you
18 will be looking back and looking at what's been the
19 history of fall soil nitrates in the field and how
20 closely you have been hitting the mark.

21 MR. WISE: Thank you. That's all I
22 had.

23 EXAMINATION

24 BY MS. MARCHIORO:

25 Q Thank you. So a while back you were answering questions

1 from your counsel with respect to ARM.

2 A Yes.

3 Q Okay. And one of the things I recall you saying was that
4 you were trying to make certain that you have decent
5 depth to groundwater.

6 Do you remember that?

7 A Yes.

8 Q Is that in terms of separation between where you're
9 applying manure --

10 A Yes.

11 Q -- or the liquids onto the field and where the
12 groundwater is?

13 A Yes.

14 Q Okay. And why would you want to have a decent depth
15 between those two?

16 A It's a risk factor really. I mean, if you've got -- if
17 you've got a saturated top foot particularly, then you
18 really don't want to be applying to that field.

19 The risk of movement in nutrients and of -- and of
20 pathogens and the manure itself is too high, particularly
21 when you're in the spring, when we're hoping -- we need,
22 not just a holding capacity for that manure, but also for
23 any subsequent rain that might fall.

24 So it's not just that the groundwater is right there
25 and the manure is above it. It's also we might get more

1 rain and where is that going to go?

2 Q So wouldn't the same concept apply to a lagoon, that you
3 want a certain amount of separation between the bottom of
4 the lagoon and groundwater because you're going to have
5 the ability for, whether you want to call it leaky or
6 seepage, but that water could be filtrating down and in a
7 lagoon, you've got to even up -- you know, you've got the
8 head. You've got all sort of different things.

9 You want to protect that groundwater; right?

10 A I guess so. I just -- I'm not a lagoon expert really
11 that -- where we've been looking at groundwater on --
12 under ARM, it's been very specifically, is it in -- is it
13 so close to where you're going to be putting the manure
14 that either the groundwater could rise and it could be
15 contacted or the, you know, subsequent rains could
16 inundate the field as a result of your application and
17 you end up with runoff?

18 Q Wouldn't you also have not just runoff, you also have
19 seepage, right, down to the groundwater on the
20 application to the field if it's saturated?

21 A Yes.

22 Q And that same concept applies whether there is a lagoon
23 or whether you're sprinkling the manure?

24 A Yeah. Other than, you know, in the soil itself, you're
25 talking about a fairly -- you're talking about a lot of

1 air spaces on the compacted soil.

2 So there's, you know, the -- the opportunities for
3 movement within the soil are different from the lagoon
4 compacted liner, I imagine.

5 MS. MARCHIORO: Thank you.

6 JUDGE FRANCK: Questions based on the
7 board questions?

8 MS. NICHOLSON: Nothing.

9 JUDGE FRANCK: Ms. Matsumoto?

10 MS. MATSUMOTO: None from me.

11 JUDGE FRANCK: Thank you very much.

12 You are excused.

13 Ms. Nicholson, do we have another witness?

14 MS. NICHOLSON: We do. I would like
15 to call Dan Wood.

16 JUDGE FRANCK: The court reporter is
17 going to swear you in.

18

19 DAN WOOD, having been first duly sworn
20 by the Certified Court
21 Reporter, testified as follows:

22

23 DIRECT EXAMINATION

24 BY MS. NICHOLSON:

25 Q Good afternoon, Mr. Wood.

1 A Good afternoon.

2 Q What is your current title?

3 A I am the executive director of the Washington State Dairy
4 Federation.

5 Q And how long have you been with the Washington State
6 Dairy Federation?

7 A Since January of 2013.

8 Q And before that, where were you?

9 A I was with the Washington State Farm Bureau.

10 Q And how long were you with the Washington State Farm
11 Bureau?

12 A About 15 years, with a few years in the middle of that as
13 the county commissioner down in Grays Harbor.

14 Q I would like you to pull up Exhibit I-10 and look on
15 Page 6.

16 A Lot of open binders here.

17 Q Yeah. So I-10 is going to be in the big binder. Let me
18 know --

19 A Tab 10, you said?

20 Q Yes. I-10. Page 6. And that should be the expert
21 report of Dr. Neiberger.

22 A It is, yes.

23 Q Okay. Dr. Neiberger included a little figure there at the
24 top. It's Figure 5.

25 Do you see that?

1 A Yes.

2 Q I just thought that might help you over this next
3 question I have.

4 Over the first week's testimony, we heard quite a
5 few different estimates of the number of dairies in the
6 state.

7 Can you clarify for the board how many dairies are
8 there in Washington?

9 A The Department of Agriculture reports there are 377
10 dairies.

11 Q 377 dairies. And how many of those are CAFOs?

12 A They report by range, and 147 of those are 199, so that
13 would leave 230.

14 Q 230 that are CAFOs. Okay. Thank you.

15 Now, has the number of dairies decreased over the
16 years?

17 A Yeah. In 1993 we had 2,500 dairies in Washington State,
18 and so we have lost 85 percent of our dairies in the last
19 25 years.

20 Q You testified that we have 377 dairies in the state.

21 How many of those must comply with the Dairy
22 Nutrient Management Act?

23 A 100 percent of them.

24 Q Regardless of size?

25 A Correct. Even if they have just one cow.

1 Q Is there any evidence that the majority of dairies in
2 this state are complying with the Dairy Nutrient
3 Management Act?

4 A There is. There is a report from the Department of
5 Agriculture that speaks to that.

6 Q Could you look at Exhibit I-47, please.

7 A Same binder?

8 Q Same binder.

9 A Okay.

10 Q And what is that exhibit?

11 A This is a report to the legislature and other state
12 stakeholders June 2016 from Washington State Department
13 of Agriculture. The title is "Implementation of Nutrient
14 Management Training Program for Farmers."

15 Q And is this the report that you were relying on, is that
16 the majority of dairies are complying with the Dairy
17 Nutrient Management Act?

18 A Yes.

19 Q Who produced this report?

20 A This was the Washington State Department of Agriculture.

21 Q And who was it given to again?

22 A It was presented to the house and senate agricultural
23 committees. They each have slightly different names, but
24 committees with jurisdiction over agricultural issues.

25 Q Please turn to Page 8 of that report.

1 A Okay.

2 Q And can you tell me what on this page supports your
3 statement that a majority of dairies are complying with
4 the Dairy Nutrient Management Act?

5 MR. TEBBUTT: Your Honor, I'm going to
6 interpose an objection to this exhibit.

7 Mr. Wood had nothing to do with the preparation of
8 this, and, therefore, there's a lack of foundation.
9 There's no witness from Department of Ag who's testified
10 about how it was done or anything along those lines.

11 MS. NICHOLSON: This is a public
12 document from -- produced from the Department of
13 Agriculture and presented to the legislature.

14 JUDGE FRANCK: Well, are you
15 objecting to the admission of it or for her to --

16 MR. TEBBUTT: The use of it and any
17 potential admission of it, yes.

18 JUDGE FRANCK: Okay. Well, I'm going
19 to allow her certainly to question about it.

20 Q (By Ms. Nicholson) Okay. Are you on Page 8?

21 A Yes. So Table 3, which is in the middle of the page
22 there, shows that from -- in this report period, from
23 June of 2014 to March of 2016, that they showed 94 to
24 96 percent of the dairies in compliance with the Dairy
25 Nutrient Management Act.

1 Q Thank you.

2 Mr. Wood, what was Washington State Dairy
3 Federation's purpose in filing this appeal of the 2017
4 CAFO permits?

5 A We had some concerns with some aspects of the permit.
6 Our dairy farmers are looking for a permit that is based
7 on sound principles, that is something that can be
8 implemented that will protect the groundwater and surface
9 water.

10 And there are some aspects of the permit that we
11 think are not possible to implement as it's adopted.

12 Q And are some of those aspects of the permit regarding
13 soil sampling as we've presented testimony this week?

14 A Yeah. The soil sampling, the depth and frequency that
15 have been spoken to by some of the other experts and
16 witnesses, the adaptive management, the change in where
17 you measure the vertical separation from the lagoon and
18 the groundwater.

19 Q Okay. Thank you.

20 Did you participate in the CAFO permit drafting
21 process?

22 A Yes.

23 Q And what -- and how did you participate?

24 A We provided comments on the preliminary draft, the
25 official first draft, the official second draft, and we

1 participated in multiple meetings.

2 Q And could you look at Exhibit R-16, please. And R --
3 there you go.

4 And is -- why don't you tell me what R-16 is.

5 A This is the comments submitted by the Washington State
6 Dairy Federation dated August 29th.

7 Q So what version of the permit would this have been
8 regarding?

9 A Based on the timing, my assumption is, this was on the --
10 on Draft 2, which would have been the third and final
11 iteration that was put out for comments.

12 Q Okay. Thank you.

13 And is there anything in those comments that regards
14 manure lagoon design?

15 A Regarding the manure lagoon design, we have comments
16 about the -- I think we have comments about the lagoon
17 assessment, but in terms of the change of where you
18 measure the two feet of separation, no, that's not in
19 here. That was not available to us in any of the three
20 iterations that were available for comment.

21 Q Could I have you look at Exhibit R-2 on Page 13. And
22 that's Section S4.B. that should be PDF Page 13 as well.

23 A R-2.

24 Q Should be Page 13, Section S4.B, B like boy.

25 A Yes. Okay. S4.B.

1 Q Yes. Did any of this permit language come as a surprise
2 to you when you saw the final permit?

3 A Yes.

4 Q And what language was that?

5 A In the second paragraph, there is -- in parentheses, it
6 says, "measured from the outside of the earthen liner."

7 So it's -- for more context, talks about a minimum
8 of two feet of vertical separation between the bottom of
9 the lagoon, and then the language is added, "measured
10 from the outside of the earthen liner."

11 Q And did you hear Ecology testify that that parenthetical
12 definition, that the bottom of the lagoon is to be
13 measured from the outside of the earthen liner, that that
14 first appeared in the final permit?

15 A Yes.

16 Q And is that your recollection as well?

17 A That is my recollection. We did not see it in the other
18 versions.

19 Q So did you have any opportunity to provide comments and
20 feedback regarding this parenthetical definition?

21 A None.

22 Q Had you had the opportunity, would you have submitted
23 comments regarding this parenthetical definition?

24 A Absolutely.

25 Q And why is that?

1 A I think this is probably the biggest issue in this
2 appeal. I am -- for a lot of our dairies, what we've
3 heard from our dairy farmers and heard from their
4 advisors, is that they could have a lagoon that is
5 compliant with NRCS standards and functioning properly,
6 no indication of anything otherwise, and because of this
7 change in where you're measuring the two feet, their
8 lagoon would be noncompliant.

9 Q And do you recall any of the costs you heard testified to
10 about this week about becoming compliant with this permit
11 term?

12 A There have been a number of costs put out there. For,
13 you know, discussions of a liner, I've heard a figure of
14 400- to 600,000.

15 I'm not sure what the costs would be if you had to
16 add a couple of feet of clay and bentonite liner on there
17 and what -- I'm not sure what costs would be involved in
18 losing that lagoon capacity and changing any of your
19 practices, but this is a major cost concern for a lot of
20 dairy farmers.

21 Q And were you here for Dr. Neibergs' testimony that it
22 could definitely put some dairy farmers out of business?

23 A Yes. And I've heard that directly from farmers.

24 Q Okay. Did you participate in meetings with Ecology
25 regarding the draft versions of the CAFO permits?

1 A Yes.

2 Q And how many meetings do you think you participated in?

3 A Oh, I'm guessing half a dozen to a dozen over however
4 many years this process went on. I don't have an exact
5 number.

6 Q Okay. That's fine. In any of those meetings, did
7 Ecology ever communicate their intention to change the
8 definition of what is the bottom of the lagoon?

9 A No. Not once.

10 Q Do you recall any discussion at any point recalling
11 Ecology's specification that -- of the parenthetical
12 definition that there must be two feet from the bottom of
13 the liner?

14 A No. We didn't -- we didn't see it. We didn't hear of it
15 until after the final permit came out.

16 Q Can I have you look at Exhibit I-16, please, the big one.

17 A This will count as physical therapy for my shoulder
18 surgery recovery.

19 16?

20 Q I-16, yes.

21 A Okay.

22 Q Okay. First, can you tell me what happened when you
23 first saw that parenthetical definition, the bottom of
24 the lagoon, in the final permit?

25 A Well, it was actually brought to our attention by some

1 dairy farmers, and I guess our first reaction was that
2 they were misreading it because we had seen nothing of it
3 prior to the final version.

4 And so we looked, and, yes, indeed, it was in there.

5 And so we assumed that it was a mistake, so I asked
6 Jay Gordon on our staff to look at it.

7 Q And have you seen this email before, which is I-16?

8 A Yes.

9 Q And did Jay Gordon send this email at your direction when
10 you determined that the definition of bottom of the
11 lagoon had changed?

12 A Yeah. So this document, if you go to the back of the
13 document, you'll see the email from Jay Gordon, and then
14 you'll see the other folks involved in the conversation.

15 And Virginia Prest from Department of Agriculture,
16 Larry Johnson from NRCS in Spokane, and Sally Bredeweg
17 from the NRCS Portland.

18 Q What is your understanding of the response in this email
19 regarding the definition of bottom of the lagoon?

20 A So the NRCS bottom of the lagoon is the top of the liner,
21 and NRCS has made it clear that that's where they measure
22 for the two feet of separation is, from the bottom of the
23 lagoon or the top of the liner.

24 Q And once you've had that clarification, did you contact
25 Ecology?

1 A We did. I believe a phone call was made, just asking
2 them if maybe this was a -- some sort of editing error,
3 and that was our assumption.

4 Q And did you -- do you recall any response from Ecology on
5 that?

6 A We didn't get a response right away. And I'm not sure
7 that I recall if we ever did get a response.

8 MS. NICHOLSON: Thank you.

9 I would move to admit I-47, Your Honor.

10 JUDGE FRANCKS: I-47 is admitted.

11 MS. MATSUMOTO: We'll object as lack
12 of foundation.

13 JUDGE FRANCKS: I'm going to overrule
14 that. I think he knows enough about it, so I'm going to
15 admit I-47.

16 (Exhibit No. I-47 admitted.)

17 MS. NICHOLSON: Thank you.

18 I believe that's all I have for Mr. Wood at this
19 time.

20 Oh, before I step down, can I move to admit R-16?

21 JUDGE FRANCKS: R-16. I-16 or R-16?

22 MS. NICHOLSON: R-16.

23 JUDGE FRANCKS: R-16 is admitted.

24 (Exhibit No. R-16 admitted.)

25 JUDGE FRANCKS: Ms. Barney?

1

CROSS-EXAMINATION

2

BY MS. BARNEY:

3

Q Good afternoon, Mr. Wood.

4

A Good afternoon.

5

Q Since we just admitted R-16, let's take a look at that.

6

These are just --

7

A The NRCS email or is it --

8

Q No. This is your comments.

9

A Okay.

10

Q So R-16.

11

A Okay.

12

Q And I think you mentioned these were your comments based

13

on the timing of the draft, the official draft permit?

14

A I believe so.

15

Q Okay. Can I ask you to turn to Page 14 of this document.

16

They're numbered there on the bottom.

17

A Okay.

18

Q 14 of 21. And you can see the numbered paragraphs.

19

Can you tell us what these numbered paragraphs all

20

represent in the document?

21

A They're referencing sections of the permit.

22

Q Okay.

23

A Is that what you're asking?

24

Q Yes.

25

A Okay.

1 Q And so then these are the dairy federation's comments on
2 these specific sections?

3 A Yes.

4 Q Could you look at No. 14, please, where it's referencing
5 Page 20 S4.J.7.G?

6 A Yes.

7 Q And in that paragraph, you mention T-sum 200 as a
8 standard timing guideline and requested that Ecology
9 change to a standard timing guideline rather than using
10 the terms "spring green-up"?

11 A Yes. I see that.

12 Q Okay. Thank you. Thanks. That's all I have in that
13 document.

14 But if you have the permit available, which is going
15 to be R-2 -- it might be in one of the notebooks behind
16 you, the green spine. Making sure your PT is going to
17 be --

18 A I'm going to -- should have counted the reps on this,
19 but -- okay. R-2?

20 Q Yes. I wanted to ask you to turn to Page 36 in the
21 permit. Maybe 35, I guess, in that version. I'm looking
22 for Condition S7.B.

23 A B, as in boy?

24 Q S7.B, as in boy.

25 A So I have it on Page 32.

1 Q On 32. Yes. I'm sorry. I don't know how all my numbers
2 got off here.

3 So S7.B, the title there is "Existing Lagoon
4 Assessment"?

5 A Yes.

6 Q So I heard you testify earlier that one of your concerns
7 with regard to the vertical separation issue was what a
8 producer would have to do if they had found that their
9 lagoon did not have that level of separation.

10 Is it your understanding that immediately the lagoon
11 would be required to be replaced or taken out of use?

12 A No. I don't see that that would be an immediate. Our
13 concern is that, by changing where you're measuring that
14 two feet of separation, that you are deeming the lagoon
15 to be noncompliant under the permit, even though it may
16 meet the NRCS standards, and that, I think, logically
17 leads to a concern of what happens next.

18 So if you are labeling the lagoon as deficient
19 because of that, that changing of the measuring point,
20 then it naturally follows that some action would come as
21 a result of that.

22 When that happens, I don't know that that's
23 specified in the permit, but it seems that something
24 would happen.

25 Q But isn't the action that the permit requires an

1 engineering report to address the deficiencies? So no
2 specific action is required as a result of the lagoon
3 assessment.

4 It's a requirement to take a look at it and figure
5 out how to address the deficiency; correct?

6 A I would say that our experience is that if an agency such
7 as Ecology labels something as deficient, that that's not
8 the end of the conversation. It's -- something will
9 follow as a result of that label.

10 The other concern expressed by the farmers is that,
11 as soon as you label it deficient, even under a state
12 standard, that you may affect their availability to get
13 any financing necessary for other aspects of their
14 operation.

15 So the label itself, a deficiency is problematic,
16 even if it's compliant with NRCS standards.

17 Q But NRCS standards are mere guidelines; correct?

18 A They are guidelines, but I think, when there is a funding
19 source to build to that -- and I believe other experts --
20 or other witnesses testified that a lot of these lagoons
21 were built to NRCS standards since the adoption of the
22 Dairy Nutrient Management Act.

23 Q Correct. But those standards are guidelines and not
24 regulatory; correct?

25 A They are guidelines, but they're guidelines that have

1 come with funding, and they've also come with research
2 and engineering to label them as good practices.

3 And so the change in where you measure the two feet
4 then puts a different label on them that I think can be
5 problematic for the operation and the financing of the
6 farm.

7 Q So both you and Ms. Nicholson had called this a change.

8 Why do you call it a change?

9 A Well, because it wasn't that before.

10 Q That doesn't mean it's a change, does it? That just
11 means it wasn't there before?

12 A Well, I guess I would submit to you that if you're adding
13 in a phraseology that wasn't there before, that it is, by
14 very definition, a change.

15 Q Well, the permit language might have changed, but where
16 Ecology measures the two feet from, has that changed? Do
17 you know?

18 A I believe it has, and I'll agree with you that the permit
19 language changed.

20 Q So what is the basis for you to say that Ecology changed
21 its longstanding position on where that measurement
22 should be taken?

23 MS. NICHOLSON: Objection. That's
24 misstating his testimony. It's also somewhat outside the
25 scope of our direct.

1 JUDGE FRANCK: No. I think he can
2 answer.

3 A I would say the Department of Ecology changed the
4 language of where it's measured, and prior to that, the
5 standard was the NRCS guidelines.

6 So if there were not an intention or a need to
7 change where you measure, then it begs the question of
8 why Ecology changed the language.

9 And it also concerns us greatly that the language
10 was changed without any opportunity to comment on the
11 very significant implications of that change.

12 Q (By Ms. Barney) So -- but you don't have any information
13 on what Ecology's -- how Ecology measured that two-foot
14 vertical separation prior to the language being in the
15 permit?

16 I mean, I understand that you have an understanding
17 of where NRCS might be measuring that, but I'm asking if
18 you have an understanding of where Ecology measured that
19 from.

20 A I cannot go there on the reasoning that changing the
21 language in any way means you didn't change the effect.
22 I can't go there.

23 I think it is -- it is not logical, and I also
24 believe that the -- this is significant language that was
25 added in that was not available in the three drafts of

1 this permit that were put out for public comment.

2 MS. BARNEY: Thank you. That's all I
3 have.

4 JUDGE FRANCKS: Okay. Mr. Tebbutt?

5 MR. TEBBUTT: Yes, I have a few
6 questions.

7 CROSS-EXAMINATION

8 BY MR. TEBBUTT:

9 Q Who does WSDF employ, Mr. Wood? How many employees?

10 A Our employees are myself, Jay Gordon, Scott Dilley, and
11 Darcel Nootenboom.

12 Q Isn't Fred Likkel an employee?

13 A Fred is a contractor.

14 Q Okay. How long has he been a contractor?

15 MS. NICHOLSON: Objection, Your Honor.
16 Where is the relevance?

17 MR. TEBBUTT: Your Honor, this goes to
18 Mr. Haggith's credibility and the weight the board should
19 give his testimony because Mr. Haggith is a partner, as
20 Mr. Haggith testified, with Mr. Likkel.

21 And so there's complicity here and a very cozy
22 relationship between WSDF and the consultants to the
23 dairy industry, and further testimony that will be
24 elicited about the cozy testimony between WSDF and the
25 Washington State Department of Agriculture.

1 MS. NICHOLSON: Your Honor, I don't
2 understand the --

3 MR. TEBBUTT: For the record, this is
4 the politics behind the scene that no one knows about and
5 needs to be put on the record.

6 JUDGE FRANCKS: And it goes to which
7 issue?

8 MR. TEBBUTT: It goes to all of the
9 issues. It goes to the pervasiveness of the complicity
10 between the Department of Agriculture, the department --
11 the Washington State Dairy Federation, and the influence
12 that the dairy federation has on Ecology and this permit.

13 And if you'd allow Maia Bellon to testify about
14 this, we would have had that information in the record as
15 well.

16 MS. NICHOLSON: Same objection, Your
17 Honor. There's no tie to the issues before this board.

18 MR. TEBBUTT: Every single issue is
19 pervasive just like nitrate is to groundwater.

20 JUDGE FRANCKS: Okay. How much time
21 is this going to take?

22 MR. TEBBUTT: Just a few minutes.
23 Won't take long at all.

24 JUDGE FRANCKS: All right. I'm going
25 to allow it for five minutes.

1 MR. TEBBUTT: All right.

2 A So can you repeat what the question is, please.

3 Q (By Mr. Tebbutt) How long has Fred Likkel worked for
4 you?

5 MS. NICHOLSON: Objection. That
6 misstates his testimony.

7 JUDGE FRANCKS: I'm going to sustain
8 that.

9 Q (By Mr. Tebbutt) How long has Mr. Likkel been a
10 contractor for the Washington State Dairy Federation?

11 A Fred was a contractor with the dairy federation when I
12 came on staff in June of '13. How long before that, I
13 couldn't tell you.

14 Q Jay Gordon could tell us; right?

15 MS. NICHOLSON: Objection, Your Honor.
16 Relevance.

17 JUDGE FRANCKS: Well, I'm going to let
18 him pursue this for five minutes, so --

19 A The question is, could Jay Gordon tell you?

20 Q (By Mr. Tebbutt) Yes.

21 A Is that your question?

22 MS. NICHOLSON: I'm going to object to
23 lack of foundation here.

24 JUDGE FRANCKS: Well --

25 MR. TEBBUTT: Like a catch-22.

1 JUDGE FRANCKS: How about move on to a
2 question he can answer?

3 MR. TEBBUTT: Well, all right.

4 Q (By Mr. Tebbutt) How long was Jay Gordon director before
5 you were?

6 A I am recalling from conversations with Jay that he became
7 the director in -- around 2000, maybe 1999, somewhere in
8 that range.

9 Q Okay. So he'd be able to answer the questions about how
10 long Mr. Likkel was employed; right?

11 MS. NICHOLSON: That was asked and
12 answered. Objection.

13 MR. TEBBUTT: It's a simple question.
14 Just yes or no. I mean, come on.

15 JUDGE FRANCKS: You can answer.

16 A Okay. I don't know if Jay could tell you because I don't
17 know who preceded whom in their roles.

18 Q (By Mr. Tebbutt) You don't know who preceded whom.
19 Who are you talking about other than Jay?

20 A You were asking about Jay.

21 Q All right. Let's just go back to Jay would know whether
22 Fred was an employee?

23 MS. NICHOLSON: Objection. Can he let
24 him finish his answer?

25 A So I -- in answering your previous question, you were

1 asking, you asked me who besides Jay, and you had asked
2 about Fred's longevity.

3 And then you asked me whether or not Jay could
4 answer, and my answer to you was, I'm not sure who
5 preceded whom, meaning, that I don't know if Fred was
6 there in his contractor role before Jay was the executive
7 director or if Jay was the executive director before Fred
8 was contractor. I cannot answer that.

9 Q (By Mr. Tebbutt) Okay. Only Jay could answer that,
10 okay.

11 So you were present when Mr. Gordon was deposed as
12 Washington State Dairy Federation's 30(b)(6) witness in
13 the Cow Palace case; correct?

14 MS. BARNEY: Objection, Your Honor, to
15 relevance.

16 MS. NICHOLSON: Thank you.

17 MR. TEBBUTT: Do you want me to
18 address this again?

19 JUDGE FRANCKS: Well, I want you to
20 move forward.

21 MR. TEBBUTT: I'm trying. But I keep
22 getting all these objections.

23 JUDGE FRANCKS: Okay. Well, you can
24 answer the question.

25 A I'm not sure what 30(b)(6) means, but I was present when

1 you were deposing Jay in the different case.

2 Q (By Mr. Tebbutt) Right. And he was the designated
3 person to testify on behalf of the Washington State Dairy
4 Federation in the Cow Palace case; correct?

5 A Jay was the executive director at the time and was our
6 spokesman and --

7 Q Right. And so you were there when Mr. Gordon testified
8 that he got the -- an early version of the permit that's
9 now here at issue in this courtroom from Jenny Prest at
10 Washington Department of Ag before it was released
11 publicly; right?

12 MS. NICHOLSON: Objection. Foundation
13 and relevance.

14 JUDGE FRANCKS: Well, I've allowed him
15 five minutes to talk about something that I'm not sure is
16 relevant, but I'm giving you five minutes.

17 So I'm not going to sustain any more relevance
18 objections.

19 So to the extent you can answer the question, please
20 go ahead.

21 A Ask the question again, please.

22 MR. TEBBUTT: Will the court reporter
23 please read it back.

24 /////

25 /////

1 (Question on Page 1352, Lines 7
2 through 11, read by the
3 reporter.)

4 A I don't believe that's what Jay's testimony said.

5 Q (By Mr. Tebbutt) What do you believe he said?

6 A For the entire seven hours?

7 Q No. Just -- he testified that Jenny Prest sent him a
8 copy of the permit before it was released publicly;
9 right?

10 A I don't believe that was his testimony.

11 Q He believed that -- he believed that he got it from her;
12 right?

13 A I believe he said he received a document and did not know
14 from whom it had come.

15 Q From an unmarked -- with an unmarked envelope; right?

16 A That would be why he didn't know from whom it had come.

17 Q But he believed it was from Jenny Prest; correct? That's
18 what he testified to?

19 A I'm not sure that's what he said.

20 MR. TEBBUTT: Your Honor, this is the
21 original transcript from Mr. Gordon's testimony in the
22 Cow Palace case.

23 MS. NICHOLSON: Objection, Your Honor.
24 Again, we're having a relevance issue here. This is from
25 a different case entirely, from a person that is not

1 here, and it has no relevance to the issues before the
2 board.

3 JUDGE FRANCKS: Mr. Tebbutt, your time
4 is up.

5 MR. TEBBUTT: Well, Your Honor, you
6 didn't let us put Jay Gordon in. You quashed their
7 motion to allow Mr. Gordon to testify.

8 If we were allowed to put Mr. Gordon -- do you want
9 me to do an offer of proof to get through this to speed
10 this up?

11 JUDGE FRANCKS: Well --

12 MR. TEBBUTT: All right. Let's do it
13 this way: As an offer of proof, I'm going to ask for an
14 offer of proof --

15 JUDGE FRANCKS: Okay. Go ahead.

16 MR. TEBBUTT: -- to build this record
17 because this is going to go up to the higher courts.

18 As an offer of proof, if Mr. Gordon were allowed to
19 testify, he would testify that he got a permit before it
20 was made public in 2011 or 2012 and that he talked to --
21 with Ms. Prest about it before this was all public and
22 that this goes to the complicity between the Washington
23 State Dairy Federation and Washington State Department of
24 Agriculture in how they manipulated this permit.

25 And so that's just one of the offers of proof.

1 Mr. Gordon went on to testify about a number of things
2 about the relationship with -- his relationship with the
3 Department of Agriculture, with compliance issues, and
4 how Mr. Gordon didn't understand what was going on.

5 There are a lot of issues that we're offering proof
6 on with Mr. Gordon if he were allowed to testify. And
7 I'm trying to elicit this through Mr. Wood, since you
8 didn't allow Mr. Gordon to testify.

9 JUDGE FRANCKS: So let's proceed with
10 the cross-examination of Mr. Wood.

11 Q (By Mr. Tebbutt) Mr. Gordon, you were around when the
12 Cow Palace, Bosma, and DeRuyter litigation, known as the
13 cluster cases, began to get under way.

14 That's when you came on board as director of WSDF;
15 correct?

16 A They were under way, but I'm not Mr. Gordon.

17 Q Well, Mr. Wood. Right?

18 A Correct.

19 Q And so the dairy federation was involved in choosing the
20 lawyers to defend the dairy -- the Cow Palace, Bosma, and
21 DeRuyter cases; correct?

22 A That is not correct.

23 Q You met with -- Mr. Gordon met with dairies in the winter
24 of 2013 in Richland, Washington, to determine who might
25 represent Cow Palace, Bosma, DeRuyter, didn't they?

1 A We didn't choose or have any role in determining who
2 would represent them.

3 Q No. But you introduced them to the lawyers who
4 eventually became their attorney, didn't you?

5 When I say "you," I mean the dairy federation.

6 A So our role is not in choosing their counsel.

7 Q No. My question was: You introduced them to the counsel
8 who eventually became their attorneys, correct, the firm
9 of Givens Pursley in Idaho? It's a yes-or-no question.

10 A No.

11 Q You're saying you didn't, that the dairy federation
12 didn't introduce Givens Pursley?

13 MS. NICHOLSON: Objection, Your Honor.
14 He's badgering the witness. That's been asked and
15 answered.

16 And can I -- is the time up so I can object on
17 relevance grounds?

18 JUDGE FRANCKS: Yes. I'm going to --
19 I'm going to sustain that objection to relevance. I
20 think we are now beyond the scope of anything that's
21 related to this permit.

22 MR. TEBBUTT: Okay. Once again, as an
23 offer of proof, if Mr. Wood or Mr. Gordon honestly
24 testified, the offer of proof would be that the dairy
25 federation was inextricably involved in introducing and

1 part of the early strategy for how to defend against the
2 Cow Palace, DeRuyter, and Bosma litigation.

3 And this goes to the entire complicity and knowledge
4 of the dairy federation in how the permit works and how
5 they've defended against the science that is
6 incontrovertible in this case.

7 And so it's a very important part of this case and
8 the history of this case and needs to be on the record.

9 Q (By Mr. Tebbutt) You're familiar with the Bosma dairy
10 owned by Henry Bosma over in the Yakima Valley?

11 A I know who they are.

12 Q You've met them before?

13 A I have.

14 Q Did you know that Bosma won Dairy Farmer of the Year from
15 WSDF in the past?

16 A I don't know whether I knew that.

17 Q Okay. How about whether Cow Palace won Dairy Farmer of
18 the Year from WSDF?

19 A I don't know whether I knew that.

20 Q How many times did you meet with Maia Bellon about the
21 CAFO permit?

22 A I know we met with Bill Moore and Kelly Susewind. There
23 may have been a couple of times where Maia was present.

24 Q How many times?

25 A There may have been a couple of times.

1 Q Did you specifically ask her not to include groundwater
2 monitoring in the permit?

3 A I think that at all points in the process we were
4 presenting information from experts we relied upon that
5 we didn't think it was something that was a reasonable
6 expense for the information that it would provide.

7 Q All right. Answer my question, please.

8 Did you ask her specifically not to include
9 groundwater monitoring in the permit?

10 MS. NICHOLSON: Objection. That was
11 answered.

12 MR. TEBBUTT: It was not.

13 JUDGE FRANCKS: He can answer the
14 question.

15 A I think I was very clear in my answer, and I said, at all
16 points in this process, we relied upon our expert
17 information and presented that the groundwater monitoring
18 didn't provide the information that was reasonable in
19 light of the expense.

20 Q (By Mr. Tebbutt) Did you specifically ask Maia Bellon
21 not to include groundwater monitoring in the permit? Yes
22 or no?

23 MS. NICHOLSON: Same objection, Your
24 Honor. That's been --

25 JUDGE FRANCKS: I think that was asked

1 and answered.

2 MR. TEBBUTT: It hasn't been answered.
3 It was abated. He said "generally." I'm asking
4 specifically.

5 A I didn't say "generally." I said "all."

6 Q (By Mr. Tebbutt) Okay. So that includes Maia Bellon?

7 JUDGE FRANCK: You can answer that.

8 A Yes.

9 Q (By Mr. Tebbutt) And the same with surface water
10 monitoring; you allowed her not to include that in the
11 permit too. Correct?

12 MS. NICHOLSON: Objection.
13 Argumentative.

14 JUDGE FRANCK: I'm going to allow it.

15 Q (By Mr. Tebbutt) Yes or no?

16 A I believe that was consistent with what we had
17 communicated at all points.

18 Q So that's yes; correct?

19 MS. NICHOLSON: Objection.
20 Argumentative.

21 JUDGE FRANCK: Okay. I'm going to
22 sustain that objection.

23 MR. TEBBUTT: Just trying to get on
24 the record that the witness is trying to get out of the
25 question.

1 MS. NICHOLSON: Objection. That was
2 inappropriate.

3 JUDGE FRANCKS: Mr. Tebbutt, just ask
4 some questions.

5 MR. TEBBUTT: That's what I'm doing,
6 and I'm not getting answers. I'm getting evasive
7 answers. My job is to ask specific questions, and I'm
8 not getting specific answers.

9 Q (By Mr. Tebbutt) You were asked some questions about
10 the -- about the number of CAFOs in the state, and I
11 believe you said 230 -- there are 230 CAFOs.

12 Is that dairy CAFOs?

13 A There are two 230 dairies that are 200 or above in their
14 size.

15 Q Okay. How many above 700?

16 A I don't have that number. I was only looking at what
17 reached the threshold of that 200 because that's where
18 the cutoff is on the CAFOs.

19 Q Right. And you've heard testimony that only about ten of
20 them are subject to the 2006 permit; correct?

21 MS. NICHOLSON: Objection. I don't
22 believe I've heard that testimony.

23 MR. TEBBUTT: I'm asking him, not
24 counsel back there.

25 JUDGE FRANCKS: He can answer the

1 question.

2 A I believe I heard a different number about the previous
3 permit.

4 Q (By Mr. Tebbutt) What was the number you heard?

5 A I thought I had heard the number 24 that had applied for
6 the past permit.

7 Q Okay. Even if it's 24, that's only about 10 percent of
8 the meeting of large CAFOs in this state?

9 A That would be correct math.

10 Q Let's take a look at I-47, Page 8, Table 3, please.
11 I-47.

12 You were asked questions about it on direct?

13 A Is this -- this says Exhibit 1 through 61. Is that the
14 I?

15 Q Yes. That looks like yours.

16 A Thank you. Is this "Implementation of Training Nutrition
17 Program for Farmers"?

18 Q Yes.

19 A Okay.

20 Q Please look at Page 8, Table 3. You were asked questions
21 by Ms. Nicholson on direct about this just a short while
22 ago.

23 A Okay.

24 Q And so these were the compliance rates?

25 A 94 to 96 percent.

1 Q Right. And do you realize that Cow Palace, Bosma, and
2 DeRuyter would have been considered to have been in
3 compliance with these time periods that are listed in
4 Table 3?

5 MS. NICHOLSON: Objection. Lack of
6 foundation.

7 JUDGE FRANCKS: I'm going to let him
8 answer.

9 A I don't have the information on specific farms.

10 Q (By Mr. Tebbutt) All right. And, in fact, Judge Rice
11 had made -- had made -- you read Judge Rice's opinion in
12 the Cow Palace case; right?

13 A Yes, I did.

14 Q And Judge Rice found that the Department of Agriculture
15 found that Cow Palace was actually in compliance with its
16 DNMP while at the same time they were causing an imminent
17 and substantial endangerment to public health; correct?

18 MS. NICHOLSON: Objection. Again,
19 lack of foundation.

20 JUDGE FRANCKS: I'm going to let him
21 answer.

22 A I'm not sure if that's exact language that was in his
23 ruling.

24 Q (By Mr. Tebbutt) Do you take issue with what I just said
25 then?

1 A No. What I said is, I'm not sure if that's the exact
2 language that was in his ruling.

3 Q You don't disagree with the general proposition? You
4 just disagree with the specific language that I used?

5 MS. NICHOLSON: Objection. That was
6 asked and answered.

7 JUDGE FRANCKS: I'm going to allow him
8 to answer that.

9 A What I'm uncertain of is whether that's the exact
10 language from the ruling or if that's your
11 characterization of the language from the ruling.

12 Q (By Mr. Tebbutt) Okay.

13 A I don't have it in front of me.

14 Q Please take a look at Exhibit A-77 in the environmental
15 appellants' book. Should be behind you. It will be 77
16 through 80 we're going to talk about. You can put the
17 other book away. I'm done with it.

18 A I'm sorry. 77?

19 Q Yes. Exhibit 77.

20 A Okay.

21 Q This is an email from you to Scott Dilley and Jay Gordon;
22 correct?

23 A Yes, it is.

24 Q And then the bottom one is an email from Fred Likkell to
25 you and David Haggith; correct?

1 A Yes, it is.

2 Q And then if you'll take a look at Exhibit 78, the very
3 next exhibit, this is the report that is referenced in
4 Exhibit 77. Isn't it the report from Fred Likkell to you?

5 MS. NICHOLSON: Your Honor, I'm going
6 to object to the relevance of this email. It has no
7 relevance to the issues before the board.

8 MR. TEBBUTT: That's funny because the
9 second one down says "CAFO permit" on it.

10 JUDGE FRANCKS: Well, I'm going to
11 allow it.

12 A So your question is?

13 Q (By Mr. Tebbutt) This is the report you asked Fred
14 Likkell to send to you in November of 2016; correct?

15 A It appears to be.

16 Q And it has a whole listing of issues, including the CAFO
17 permit, doesn't it?

18 A Yes, it does.

19 Q And negotiations with Lummi Nation that regards the
20 concerns about the closure of the shellfish beds in
21 Portage Bay; correct?

22 MS. NICHOLSON: And, again, Your
23 Honor, now I'm going to object on relevance because that
24 is not relevant before the issues before the board.

25 And I had another one, but I lost it.

1 JUDGE FRANCKS: I'm going to sustain
2 the relevance because we're talking about the CAFO
3 permit.

4 MR. TEBBUTT: That's correct. And
5 what we're talking about is the influence of the industry
6 on closing shellfish beds on contaminating the
7 Sumas-Blaine Aquifer, on contaminating the Yakima Valley
8 Aquifer. Couldn't be any more relevant to the issues.

9 MS. NICHOLSON: I remember my second
10 objection. This goes way beyond the direct testimony as
11 well.

12 JUDGE FRANCKS: Yes. Definitely does
13 that as well.

14 So we're going to be limited to what happened on
15 direct and what's relevant to the issues in this case.

16 MR. TEBBUTT: Well, again, as an offer
17 of proof, Mr. Gordon had been allowed to testify, we
18 would have talked about all of this and got this in to
19 show Mr. Gordon and the Washington State Dairy Federation
20 have been aware of the contamination and the closure of
21 the shellfish beds due to the dairy industry for more
22 than a decade, in fact, close to two decades, and the
23 contamination of the Yakima Valley Aquifer for at least
24 15 years.

25 And this board has prevented us from getting that

1 testimony in, so it's an offer of proof. We make that
2 for the record.

3 JUDGE FRANCKS: Okay.

4 THE WITNESS: So I'm not sure where we
5 are with --

6 MR. TEBBUTT: I'm going to ask you
7 another question.

8 I move to admit A-77 and A-78.

9 MS. NICHOLSON: Objection, Your Honor,
10 again to relevance. The one document that he has -- the
11 attachment has the words "CAFO permit" and to the extent
12 that it has -- that he testified to that, we don't have a
13 problem, but the emails and the rest of the information
14 here has no relevance to the -- to the issues before the
15 board.

16 JUDGE FRANCKS: You're doing A-77 and
17 A-78 together?

18 MR. TEBBUTT: Yes.

19 MS. NICHOLSON: The testimony he tried
20 to elicit regarding these particular exhibits had nothing
21 to do with the CAFO permit.

22 MR. TEBBUTT: That's their opinion.
23 Our opinion is quite different. It does indeed say "CAFO
24 permit."

25 JUDGE FRANCKS: I'm going to admit the

1 one that says CAFO permit on it. Actually, I'll admit
2 both of them since it's referring to it, so --

3 MR. TEBBUTT: One sets up the other.

4 JUDGE FRANCKS: A-77 and A-78 are
5 admitted.

6 (Exhibit Nos. A-77 and A-78
7 admitted.)

8 Q (By Mr. Tebbutt) Okay. Let's take a look at A-79.

9 JUDGE FRANCKS: Mr. Tebbutt, can I
10 just inquire how much longer you think you might be
11 today?

12 MR. TEBBUTT: I can get done in about
13 the next ten minutes, if the objections slow down.

14 JUDGE FRANCKS: That would be
15 excellent. Carry on.

16 Q (By Mr. Tebbutt) You have A-79 in front of you?

17 A I do.

18 Q And this is a document created by the Washington State
19 Dairy Federation?

20 A It is.

21 Q And did you assist in creating it?

22 A Yes.

23 Q And one of the things, if you'll look at the second
24 bolded heading, what does the Ecology permit mean for
25 you? Do you see that?

1 A Yes.

2 Q So this goes to what you were advising your members about
3 whether to get the permit; correct?

4 MS. NICHOLSON: Objection, Your Honor.
5 This goes far beyond direct.

6 JUDGE FRANCKS: I'm going to allow it.

7 A So we have never told anybody that they should or should
8 not apply for the permit. What we have in this is a --
9 either direct quotes or a summary of what the permit
10 says.

11 Q (By Mr. Tebbutt) Well, it's more than that, isn't it?

12 I mean, you say here in the second line down that
13 the main question we were getting from producers is this,
14 quote, Am I required to get one of these permits, end
15 quote.

16 And your answers are just below that, aren't they?

17 A Yes. Let me read it.

18 Q I just did read it. So I'm not asking you to read it
19 right now. I'm just asking you a question.

20 MS. NICHOLSON: Objection, Your Honor.
21 He's badgering the witness.

22 Q (By Mr. Tebbutt) You can read it to yourself, but I
23 don't want you to read it out loud right now. If you
24 want to read it to refresh your recollection -- do you
25 want to do that, Mr. Wood?

1 A So as I understand your question -- well, at this point I
2 don't understand your question.

3 Q Well, I haven't really asked you one. You just said you
4 wanted to read it.

5 Do you want to read it to yourself?

6 A You asked a question before I said I would read it, but I
7 don't know what that question is now.

8 MR. TEBBUTT: Can I make the objection
9 the witness is being argumentative?

10 A I'm trying to find out what your question is.

11 JUDGE FRANCKS: Mr. Wood, go ahead and
12 read it.

13 Q (By Mr. Tebbutt) To yourself.

14 A I've read it. I don't -- I was wanting to read it in
15 order to answer his question, but now I don't recall what
16 his question is.

17 Q So what I'm asking is, those three bolded points, isn't
18 that the information that you give to your members?

19 A Those three bolded points are a summation of the
20 requirements of the permit and are provided because
21 the -- the questions we're getting include, "Am I
22 required to get one of the permits?"

23 Q And how do you respond to those members?

24 A By telling them what the permit says.

25 Q And those are the three bolded points here in A-79?

1 A Yes. But that is not advice on whether they should get
2 the permit. It is simply telling them what the permit
3 says.

4 Q So have you ever told any of the members not to apply for
5 the permit because no one can prove that, for instance,
6 lagoons actually discharge to groundwater?

7 A We have not told people whether they should apply or not
8 apply. We have told them the provisions in the permit
9 that they ought to look at before making their decision.

10 MR. TEBBUTT: All right. Move to
11 admit A-79.

12 MS. NICHOLSON: Objection, Your Honor.
13 Again, relevance. How is this relevant to the issues
14 before the board?

15 JUDGE FRANCKS: I'm going to allow it.
16 So A-79 is admitted.

17 (Exhibit No. A-79 admitted.)

18 Q (By Mr. Tebbutt) How often have you met with Gerald
19 Barron (phonetic)?

20 MS. HOWARD: Objection, Your Honor.
21 Relevance.

22 MR. TEBBUTT: Give me just a couple
23 questions. I'll link it all up to relevance.

24 JUDGE FRANCKS: Well, what's the
25 relevance now? Who's Gerald Barron?

1 Q (By Mr. Tebbutt) Who is Gerald Barron, Mr. Wood?

2 JUDGE FRANCK: No, Mr. Tebbutt. I
3 asked you.

4 MR. TEBBUTT: Oh, Mr. Barron is a
5 strategist for the dairy federation, and Exhibit A-80 is
6 his strategy for defending against the CAFO permit and
7 other litigation in the state of Washington on behalf of
8 the Washington State Dairy Federation.

9 MS. NICHOLSON: Objection, Your Honor.
10 This is incorrect, and he's providing testimony that is
11 improper.

12 JUDGE FRANCK: And how is this
13 relevant to the issues before the board today?

14 MR. TEBBUTT: Couldn't be more
15 relevant, once again, because this is the strategy that
16 was laid out and this is the strategy that they're
17 implementing, and it's not based on science. If you'll
18 allow me to ask some questions about it, I can -- this is
19 allowable cross-examination of a witness.

20 JUDGE FRANCK: I think we're beyond
21 the scope of direct, so I'm not going to allow this line
22 of --

23 MR. TEBBUTT: Your Honor, with all
24 respect that's due, Mr. Wood was asked on direct
25 specifically about permits and how it affects the

1 industry and how it affects people who -- you know, his
2 members and their ability to survive.

3 This is directly relevant to the tactics that
4 they've used to try to survive despite the fact that the
5 science is all against them.

6 So this strategy is critical to what their game plan
7 of how they've implemented this. This is the stuff they
8 wouldn't give us in response to discovery, and we had to
9 get it in a motion to compel.

10 JUDGE FRANCKS: But what issue is it
11 relevant to?

12 MR. TEBBUTT: All of them. About
13 leakage of lagoons. One says false assumption that
14 leakage equates to pollution. That's one of the issues.
15 It's based on false unproven assumption of pollution from
16 lagoons not justified by current science. This is their
17 language.

18 JUDGE FRANCKS: Mr. Tebbutt.

19 MR. TEBBUTT: It couldn't be more
20 relevant, Your Honor.

21 JUDGE FRANCKS: And I find that it's
22 not relevant, so please continue your cross-examination
23 if you have anything left for Mr. Wood.

24 MR. TEBBUTT: All right. I move into
25 evidence A-80.

1 MS. NICHOLSON: Objection, Your Honor.

2 JUDGE FRANCKS: And the objection is?

3 MS. NICHOLSON: The objection is,
4 there's no relevance for any issue before this board.

5 JUDGE FRANCKS: Okay. And I'm going
6 to sustain that, and we're not going to admit A-80.

7 MR. TEBBUTT: Okay. As an offer of
8 proof, if Mr. Wood were allowed to testify about this, he
9 would say this is the strategy that Gerald Barron, a
10 crisis management consultant for -- a self-proclaimed
11 crisis management consultant -- even has that language on
12 A-80 -- used to defend this industry against legitimate
13 scientific principles that are directly at the heart of
14 the issue in this permit.

15 Your Honor, may I approach to hand you some
16 documents?

17 JUDGE FRANCKS: Yes. But what are
18 they?

19 MR. TEBBUTT: It's an email from
20 February of 2018.

21 JUDGE FRANCKS: And why are we just
22 seeing it now?

23 MR. TEBBUTT: Because it's
24 cross-examination. It's impeachment.

25 MS. NICHOLSON: Objection, Your Honor.

1 How is this relevant to our direct testimony? How is
2 this responsive to the direct testimony and how is it
3 relevant to the issues before the board?

4 MR. TEBBUTT: Again, because Mr. Wood
5 has testified that his poor industry is being put at risk
6 and they're making representations to agencies that are
7 false.

8 MS. NICHOLSON: Your Honor, this is
9 testimony by the attorney. There are no facts in
10 evidence to support his testimony.

11 MR. TEBBUTT: Trying to get the facts
12 and the documents in.

13 I can tell you specifically the issue here. And
14 we've had testimony about the DeRuyter facility and
15 Mr. Erickson testified about how it has been a threat to
16 the community because of the same facts that are present
17 in the Cow Palace case.

18 And this letter from the dairy federation where the
19 dairy federation is touting its members as wonderful
20 people. If these are the wonderful compliant people,
21 this goes to the compliance issues in Table 3 that we
22 just talked about.

23 It goes to the dairy federation's representations of
24 whether dairies are in compliance with their various
25 permits, and this document from Jay Gordon of the dairy

1 federation and Mr. -- if allowed to testify, I'm sure
2 Mr. Wood would verify that he was part of this to EPA,
3 saying what a great dairy family the DeRuyter facility
4 is.

5 JUDGE FRANCKS: This is beyond the
6 scope of the issues in this case, so this is not
7 relevant. And this is part of the thread that we are not
8 pursuing.

9 So do you have other questions for Mr. Wood?

10 MR. TEBBUTT: If allowed as an offer
11 of proof, this document would show that the dairy
12 federation believes that the DeRuyters are, and I quote,
13 "one of the hardest working families I have ever known.
14 This family has continued to be dairy industry leaders in
15 innovation despite the fact that they're contaminating
16 their community."

17 MS. NICHOLSON: Objection. Your
18 Honor, again, this is improper testimony from counsel.

19 JUDGE FRANCKS: Yes. Mr. Tebbutt,
20 you're going to restrain from testifying and please --

21 MR. TEBBUTT: These are offers of
22 proof, Your Honor. I'm not testifying. You know that
23 that's not testimony.

24 What I say is not testimony. What the witness says
25 is testimony. I understand that.

1 Q (By Mr. Tebbutt) Sir, you've read the EPA Yakima Valley
2 study; correct?

3 A Are you talking about from 2012?

4 Q Yes.

5 A Yes.

6 Q And the dairy federation hired numerous people to try to
7 poke holes in that document; correct?

8 MS. NICHOLSON: Objection. Your
9 Honor. Argumentative again.

10 JUDGE FRANCKS: I'm going to sustain
11 that.

12 Q (By Mr. Tebbutt) Sir, how many people have you met with
13 in the Yakima Valley who drink contaminated water because
14 of the cluster dairies?

15 MS. NICHOLSON: Objection, Your Honor.
16 Argumentative. Outside the scope of direct and lack of
17 relevance here.

18 JUDGE FRANCKS: I'm going to sustain
19 that on outside of the scope of direct.

20 MR. TEBBUTT: Okay. Well, it's
21 certainly not outside the scope of relevance, and this is
22 appropriate impeachment.

23 So with that and being shut down on ability to put
24 that in, I'm done.

25 JUDGE FRANCKS: Okay. Redirect?

1 MS. NICHOLSON: Yes. Just very
2 briefly.

3 REDIRECT EXAMINATION

4 BY MS. NICHOLSON:

5 Q Very quickly, Mr. Wood, under R-16, which is your
6 comments to Ecology, this was on Page 14.

7 A Okay. It's buried. Hold on.

8 Q Sorry.

9 A Which page?

10 Q Page 14 under R-16.

11 A Okay. Happens to be open to that page.

12 Q That's lovely. Do you recall what your concern was?
13 You -- why you mentioned T-sum 200 in this particular
14 paragraph?

15 A Yeah. I think, in the context we're talking about,
16 spring green-up being a -- it says it's a term -- not a
17 term we understand. The concern was that that was a very
18 fuzzy phrase and that there are other options out there
19 that are more specific, and T-sum 200 was an example of
20 that, but it is certainly not the only example.

21 Q And then very briefly, with the prior permit, do you
22 recall if you had any indication or belief that Ecology's
23 definition of bottom of the lagoon was any different than
24 NRCS's as reflected in the prior permit?

25 A You're talking about the 2006 permit?

1 Q I am.

2 A There was nothing to indicate there was any distinction
3 that we're aware of.

4 Q And you were not informed otherwise?

5 A No. I had not heard that that had always been Ecology's
6 position until this hearing.

7 MS. NICHOLSON: Okay. Thank you.

8 JUDGE FRANCK: Board questions?

9 Thank you, Mr. Wood, you're excused.

10 So --

11 MS. HOWARD: We can do this in the
12 morning, if you'd like, but we needed to address the
13 addition of these read and review corrections to
14 Mr. Reck's --

15 JUDGE FRANCK: Okay. Let's do that
16 in the morning. We'll do that first thing. Okay.

17 We are off the record. We'll reconvene tomorrow
18 morning at 9:00.

19 (Proceedings adjourned at
20 4:44 p.m.)

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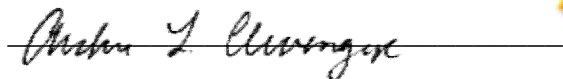
I, ANDREA L. CLEVINGER, a Certified Court Reporter in and for the State of Washington, residing at Olympia, authorized to administer oaths and affirmations pursuant to RCW 5.28.010, do hereby certify;

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 1117 through 1379;

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 27th day of June, 2018.


(Court Reporter, CCR No. 3041)

