

SOAH DOCKET NO. 582-15-2082

TCEQ DOCKET NO. 2015-0069-MSW

APPLICATION OF)	BEFORE THE STATE OFFICE
130 ENVIRONMENTAL PARK,)	
LLC, FOR PROPOSED)	OF
PERMIT NO. 2383)	
)	ADMINISTRATIVE HEARINGS

HEARING ON THE MERITS

Thursday, August 18, 2016

BE IT REMEMBERED THAT at 9:09 a.m., on Thursday, the 18th day of August 2016, the above-entitled matter came on for hearing at the State Office of Administrative Hearings, William P. Clements, Jr., Building, 300 West 15th Street, Room 404, Austin, Texas, before KERRIE JO QUALTROUGH and CASEY BELL, Administrative Law Judges, and the following proceedings were reported by Dalia F. Inman and Lorrie A. Schnoor, Certified Shorthand Reporters.

Volume 4

Pages 745 - 1012

P R O C E E D I N G S

THURSDAY, AUGUST 18, 2016

9:09 a.m.

JUDGE BELL: All right. We're back on the record, August 18th on 582-15-2082, 130 Environmental Park, LLC Application. And we'll continue with cross-examination of Mr. Adams, and I believe we were to TJFA and EPICC.

MR. ALLMON: Yes, Your Honor.

JUDGE BELL: All right. Go right ahead.

PRESENTATION ON BEHALF OF APPLICANT (CONTINUED)

GREGORY W. ADAMS, P.E.,

having been previously duly sworn, testified as follows:

CROSS-EXAMINATION

BY MR. ALLMON:

Q Good morning, Mr. Adams. My name is Eric Allmon. I represent certain Protestants in this matter. I believe we've met before.

A Yes, sir.

Q I guess I want to start by looking at one of the changes which you made yesterday. That was in Exhibit 130EP-3, Page 34.

A Did you say 130EP3-34?

Q Let me get my volume. Let me check. I apologize. EP-2, Page 34.

1 A Okay. I have that.

2 Q And just to review, what was the change that
3 you made on this page?

4 A In the second paragraph, midway through the
5 sentence that did read, "Contaminated water will be
6 discharged to the surface water management system to be
7 constructed at the site," and I changed that to read,
8 "The contaminated water will not be discharged to the
9 surface water management system to be constructed at the
10 site."

11 Q Is it fair to say that the addition of that
12 "not" reversed the meaning of this sentence?

13 A Yes.

14 Q Is that a substantive change?

15 A I do not know the definition that you're using.

16 Q Is that a change in how the facility will
17 operate?

18 A No. Because the prohibition on discharging the
19 contaminated water is contained in other parts of the
20 permit. So it was in conflict with other parts of the
21 permit.

22 Q But if we looked at this sentence, and what
23 this sentence stated, is the change from discharging
24 contaminate water into the surface water management
25 system a change in operation from not discharging the

1 material in the surface water system?

2 A It is a -- the "not" changes the meaning of the
3 sentence.

4 Q When was the decision made to make this change
5 to the application?

6 A When -- when I -- before I came up here, after
7 I become aware of it during previous testimony that
8 there was a typographical error.

9 Q When you say "previous testimony," what
10 testimony are you referring to?

11 A I believe that was Mr. Traw.

12 Q Now, were there any discussions that led up to
13 the decision to make that change? Were there
14 discussions leading to the decision to make that change?

15 A The discussions between who?

16 Q Between you and anybody.

17 A Yes. I -- they asked me about that word, and I
18 told them that was a typographical error.

19 Q And when you say "they," who is "they"?

20 A Brent Ryan.

21 Q Okay. So when did you have that discussion
22 with Mr. Ryan?

23 A Sometime between Mr. Traw's testimony and my
24 testimony.

25 Q Okay. So yesterday?

1 A Yes.

2 Q So that decision to make this change was made
3 yesterday?

4 A Yes.

5 Q Were you asked questions specifically about
6 this language during your deposition in November of
7 2015?

8 A I don't recall being asked.

9 Q Well, let me refresh your memory.

10 MR. ALLMON: May I approach?

11 JUDGE BELL: Yes.

12 Q (BY MR. ALLMON) Okay. I am showing -- let me
13 pull up --

14 I am providing you with a copy of your
15 deposition, sir. Looking at Page 122, Line No. 9. And
16 at that point I asked you a question:

17 "Could you turn -- could you turn with me
18 to Page B9 in this report and look with me in the second
19 paragraph there. Do you want to review that paragraph
20 real quickly?"

21 And your answer?

22 A "Okay."

23 Q "What does this say with regard to the
24 discharge of contaminated water at the facility? How
25 will contaminated water at the facility be discharged?"

1 A (Reading.)

2 Q When I ask -- yes, how did you answer that
3 question?

4 A "This says the contaminated water will be
5 discharged to the surface water management system to be
6 constructed."

7 Q So that language was called specifically to
8 your attention in November of 2015?

9 A Is that a question?

10 Q Yes, that's a question.

11 A Oh. Yes.

12 Q Did you believe that answer to be honest at the
13 time?

14 A The answer to what did it say, that was an
15 honest answer to what it said.

16 Q Did you believe that to accurately reflect what
17 the application was intended to say?

18 A At the time that I read that? I do not
19 remember what my thoughts were at that time.

20 Q At that time, did you think that was a
21 typographical error?

22 A At that time, I don't recall. I don't remember
23 that part of the deposition.

24 Q So you didn't feel like a full and complete
25 answer to that question would involve pointing out that

1 that contained a typographical error?

2 A Evidently not.

3 Q And you had an opportunity to review this
4 deposition later, prior to signing it. Is that correct?

5 A That is correct.

6 Q And again, at that point, you didn't feel the
7 need to point out that contained -- or at least you
8 didn't see that that was a typographical error that
9 needed corrected?

10 A That appears to be true.

11 Q Would it be a problem if contaminated water
12 were discharged to the storm water management system?

13 A It would -- it would be a violation to the
14 rules.

15 Q Could you turn with me please to -- you were
16 questioned by the Executive Director regarding where
17 else the management of contaminated water was addressed
18 in the application. Where would that be? And perhaps I
19 can assist you.

20 A It will be in Exhibit 130EP-3.

21 Q Could you turn with me to Page 221 of that
22 exhibit?

23 A Page 221.

24 Q Now, as we look -- is this the section you were
25 mentioning that regards the management of contaminated

1 water?

2 A Yes, it is.

3 Q Do you want to look with me to Paragraph 3.2?

4 A Yes.

5 Q Does this propose to handle contaminated water
6 through the use of containment berms? Let me give you a
7 second to review that paragraph.

8 A Yes.

9 Q And what type of flood event are those
10 containment berms designed for?

11 A Those containment berms would be designed for
12 the 25-year, 24-hour storm event.

13 Q If you were to have a 100-year, 24-hour storm
14 event, could that bypass those containment berms?

15 A It may could.

16 Q Are there any measures to prevent contaminated
17 water -- say, that goes onto the landfill site and comes
18 in contact with waste, are there any measures to prevent
19 that contaminated water to reach the storm water
20 collection system?

21 A Yes. That's what -- that's what this section
22 addresses.

23 Q Now, this section addresses -- it uses
24 containment berms that are designed for 25-year, 24-hour
25 storm events. Is that correct?

1 A That is correct.

2 Q So they're not designed to handle a 100-year,
3 24-hour storm event?

4 A That would be correct.

5 Q If we were to have a 100-year, 24-hour storm
6 event, what would prevent the water from that event,
7 from reaching the storm water collection system?

8 A I have not analyzed that event, so I don't know
9 if they would top them or not.

10 Q So you don't know of any specific measure that
11 would prevent that?

12 A If you would turn to -- just to give you a
13 little more information about those berms.

14 Q Okay.

15 A If you would turn to Exhibit 130EP-3, Page 414.

16 Q Yes, I'm there.

17 A Okay. If you look at the left-hand -- lower
18 left-hand portion of that page, under the table that
19 says "Containment Berm Sizing Criteria," I just want to
20 note -- under the note, "Containment berms will be sized
21 to contain stormwater from the 25 year, 24 hour storm
22 event. The criteria are based on a minimum downslope
23 containment berm length of 100-feet --"

24 THE REPORTER: Can you slow down, please.

25 THE WITNESS: I've never been asked to

1 slow down before. I'm sorry. I will, yes, ma'am.

2 "The containment berms will be sized to
3 contain stormwater from the 25 year, 24 hour storm
4 event. The criteria are based on a minimum downslope
5 containment berm length of 100 feet and a freeboard of
6 0.5 feet."

7 So the design is for the 24-hour storm.
8 There is a freeboard. And what I was telling you is
9 what would happen in the hundred year, I have not
10 analyzed it to see if it would be contained within that
11 freeboard or not.

12 Q (BY MR. ALLMON) Okay. Does the general permit
13 contain any exception for contaminated water resulting
14 from a greater than a 25-year, 24-hour storm event?

15 A I don't know if it is -- the -- well, which
16 general permit?

17 Q The multi-sector general permit for the
18 discharge of industrial wastewater.

19 A Not -- well, that's a different permit, and so
20 I can't address it in here.

21 Q Okay. Thank you.

22 Okay. Let's turn to your involvement in
23 the geology report. Could you look with me in
24 Exhibit 130EP-4, Page 6?

25 A Which Page?

1 Q Volume 4, Page 6.

2 A Okay. I'm there.

3 Q Did you seal this document -- well -- what
4 document begins on 130EP-4, Page 6?

5 A Part III, Facility Investigation and Design,
6 Attachment E, Geology Report.

7 Q Did you seal this report?

8 A Yes.

9 Q Does your seal apply to the entirety of the
10 report?

11 A No. My seal -- underneath my seal, it notes
12 Sections 2.3, 5.1, and 5.2.

13 Q Is that noted on the cover of the report where
14 your seal is located?

15 A I believe this is the cover.

16 Q Okay. Yes. Thank you.

17 Q Now, are you a geologist?

18 A No.

19 Q Are you a hydrologist?

20 A No.

21 Q Are you a professional geologist?

22 A No.

23 Q Is your -- do your opinions in any way relate
24 to the -- are you intended to be expressing an opinion
25 on the hydrology beneath the site?

1 A No.

2 Q Now, let's look at the general facility design.
3 Can you turn to -- and I know we're jumping around just
4 a bit, but that's the nature of it.

5 Could you turn to 130EP-2 at Page 24. Did
6 you seal -- well, what document commences on 130EP-2,
7 Page 24?

8 A Part III, Facility Investigation and Design,
9 Attachment B, General Facility Design.

10 Q Did you seal this document?

11 A Yes.

12 Q Can we turn to the Table of Contents? That
13 would be on Page 25.

14 Does this document address endangered
15 species protection?

16 A Yes.

17 Q Are you an expert on endangered species
18 protection?

19 A No.

20 Q So did your seal apply to that section?

21 A My seal applies to that the information
22 contained in that is the information that is provided in
23 the permit.

24 Q But you're not an expert on the opinions
25 expressed there?

1 A No.

2 Q So does your seal apply to the opinions
3 expressed?

4 A It applies to that the opinions that are -- the
5 part of the summary that is provided in this is a
6 representation of the report and the information that's
7 provided elsewhere in the permit.

8 Q You're not in any way endorsing those opinions
9 by sealing this document?

10 A Well, it would depend on what you're endorsing,
11 and I'm not distancing myself from them.

12 Q But you're not expressing, necessarily,
13 agreements or an endorsement with those opinions?

14 A I have to provide the information. It's
15 provided in multiple places in the permit, and so it's
16 required to be included in this. And so this is a -- if
17 we were to look -- if we were to go back and look at
18 Page 35.

19 Q Of the same document?

20 A Of the same document.

21 Q I'm there.

22 A So if you read this, you'll see that the --
23 endangered species protection, this is not the report.
24 What is -- this section notes that a survey has been
25 conducted. In the second paragraph, it states that the

1 facility will be conducted to minimize potential impacts
2 to endangered and threatened species. I offer no -- I
3 offer no opinion on those endangered species.

4 And then in the last paragraph, it
5 identifies -- or notes that Halff identified five
6 threatened or endangered species. So it's the summary
7 of the work that was done.

8 Q By sealing the document, you're not
9 expressing -- intending to express any endorsement that
10 the development facility shall be conducted to minimize
11 potential impacts to endangered and threatened species?

12 A Well, that is a requirement. This is -- that
13 is a requirement. So that is part of the -- part of the
14 design is, we're required to minimize.

15 Q And you've placed your seal on that statement?

16 A Yeah, it's in the document that I sealed.

17 Q But you're not expressing that opinion by
18 placing that seal on the document?

19 A Could you --

20 Q I'm trying to understand what your seal meant
21 in some of these instances, where you sealed --

22 A Well, I'm sealing exactly what this paragraph
23 says.

24 Q So you're expressing that opinion, that a
25 development facility shall be conducted to minimize

1 potential impacts to endangered or threatened species?

2 A Well, that's not really an opinion; that's a
3 requirement.

4 Q But, as stated here, does this not express that
5 that will be how the facility operations are conducted?
6 I realize that that's a requirement of the rule. But as
7 stated here, is this not expressing an opinion in an
8 attempt to demonstrate compliance with that rule?

9 A No. I mean, it's a permit condition. It's
10 reiterating a permit condition. It's not a -- it -- it
11 must happen.

12 Q So your intent in stating this is merely to say
13 this is a permit requirement and not to state how it
14 will be met?

15 A That would be correct.

16 Q And not necessarily to say that it will be met?

17 A Well, that's the purpose of a permit condition.
18 It will be met.

19 Q Are you expressing any opinion on endangered
20 and threatened species by sealing this document?

21 A No.

22 Q And is the same true if we look at water
23 pollution control -- well, are you expressing an opinion
24 on the adequacy of the facility with regard to water
25 pollution control?

1 A Where -- where are we talking -- where --

2 Q If we turn to Page 34, immediately preceding
3 Page 35.

4 When you sealed this document, are you
5 intending to express an opinion regarding the
6 sufficiency of the water pollution control measures?

7 A I'm basically stating what is required of the
8 facility.

9 Q Are you expressing, as this says, an opinion on
10 whether it will meet those requirements?

11 A Whether it will meet the requirements?

12 Q Yes.

13 A Yeah, that -- that -- it's -- it's required to
14 meet those. That's the requirements it has to work
15 under.

16 Q And does this reflect an opinion that those
17 requirements will be met?

18 A That they will be -- yes.

19 Q And so you're -- are you expressing that
20 opinion by placing your seal on the document?

21 A That the -- that the requirements of the permit
22 will be met?

23 Q Uh-huh.

24 A No. The document -- this states -- it sets the
25 requirements for the permit. It's in the permit. Now,

1 are you talking about will they be met? To the extent
2 that I -- I presume they will be. But I can't
3 presume -- the facility doesn't exist, and I will not be
4 there working on the facility.

5 Q So do you have an opinion as to whether these
6 requirements will be met?

7 A Yes. My presumption is that all the
8 requirements will be met.

9 Q So is that an assumption or an opinion?

10 A Is --

11 Q In other words, are you assuming --

12 A Are you -- do you distinguish between the two?

13 Q Yes. Well, I mean, have you analyzed the issue
14 and evaluated the requirements and how the facility will
15 be operated to determine whether the -- these
16 requirements will be met?

17 A For storm water?

18 Q For storm water.

19 A Have I evaluated -- for -- for portions of
20 that, I have. Now, for portions of it, some of the --
21 the requirements will be in the permit that's yet to
22 come.

23 Q But for all of the requirements relevant to
24 water pollution control? Have you evaluated compliance
25 for all requirements related to water pollution control?

1 And I'll just step back. Specifically, do
2 you see where this page indicates 30TAC,
3 Section 330.63(b)(4)?

4 A Yes.

5 Q Are you intending to express an opinion to
6 whether the operation and design of the facility will
7 meet the requirements of 30TAC, Section 330.63(b)(4)?

8 A That is the intent of the design of the
9 facility.

10 Q And are you expressing an opinion on that
11 compliance by sealing this document?

12 A I would say that my opinion is the next
13 sentence, "The facility has been designed to keep
14 contaminate water, that is water that may have come in
15 contact with waste at the landfill, separated from
16 uncontaminated stormwater runoff." And that is my
17 opinion.

18 Q But -- and I appreciate that sentence is
19 contained within this section. I'm asking, are you
20 expressing, by sealing this document, an opinion on
21 compliance with 30TAC, 330.63(b)(4)?

22 A May I turn to that rule?

23 Q Yes.

24 A Now, be sure I'm clear. Were you talking about
25 what's in the Paragraph 330.15(h)?

1 Q I think we were turning to the rule, 30TAC,
2 Section 330.63(b)(4).

3 A Oh, 63(b)(4). I'm sorry. I was reading the
4 reference in the middle of the page.

5 Q Okay.

6 A Okay. I've read it.

7 Q Now, and so when you sealed this document, are
8 you expressing an opinion regarding compliance with
9 330.63(b)(4)?

10 A Yes.

11 Q And so what qualifications do you have to
12 evaluate whether the liquids resulting from the
13 operation of the solid waste processing facilities will
14 be disposed of in a manner that will not cause surface
15 water or groundwater pollution? Did you evaluate the
16 potential for surface water pollution?

17 A Surface water pollution?

18 Q Yes.

19 A That is addressed in the leachate and
20 contaminated water plan.

21 Q But now, did you -- in performing that, did you
22 reach an ultimate conclusion as to whether surface water
23 pollution would occur?

24 A No. We have the controls that would be
25 designed to prevent that.

1 Q And is that an evaluation you performed with
2 regard to surface water, whether that would not cause --
3 would be disposed of in a manner that will not cause
4 surface water pollution?

5 A Yes. Let me take you to that section.

6 Q Well, and maybe -- well, okay. Go ahead.

7 A Okay. We'll go to Exhibit 130EP-3, Page 221.

8 Q Yes, I'm there.

9 A Okay. If you go to the Section 3.3, that
10 addresses disposal of water. And it states there that
11 the "Contaminated surface water and groundwater will not
12 be allowed to discharge into the waters of the United
13 States. Contaminated water will be transported to a
14 POTW for treatment and disposal in accordance with
15 330.207(f)." "

16 Q And does this describe how it will not be
17 allowed, what measures are included to ensure that that
18 will not be allowed?

19 A This describes -- or this states that it --
20 that a disposal will be conducted at a publicly-owned
21 treatment works.

22 Q Now, we've talked about some of the surface
23 water control measures and such. Does this reflect any
24 evaluation of those control measures, the contaminated
25 water control measures such as those located within the

1 landfill site?

2 A This section deals with the disposal.

3 Q Okay.

4 A I thought that was your question, was about
5 disposal.

6 Q And does 330 -- does that regulation we were
7 dealing with, 330.63(b)(4), also address groundwater
8 pollution?

9 A Which? 330.63(b)(4)?

10 Q Yes.

11 A It -- that rule says the owner or operator
12 shall describe how all liquids resulting from the
13 operation will be disposed in a manner that will not
14 cause surface water or groundwater pollution.

15 Q And did you evaluate the potential for
16 groundwater pollution?

17 A No. This rule right here that we're speaking
18 of talks only of disposal.

19 Q Did you evaluate that, the disposal and how it
20 would relate to groundwater contamination?

21 A In the fact that we're saying it will be
22 disposed of at a treatment plant, that's how we --
23 that's how we -- it will be transported to a treatment
24 plant for treatment.

25 Q Okay. Let's turn back -- let's turn back to

1 130EP-2. With regard to facility access within
2 Section 1, by sealing this document, are you expressing
3 an opinion on that?

4 A Which page are we on in EP-2?

5 Q Page -- 130EP-2, Page 26.

6 A Okay. Page 26.

7 Q Yes. In sealing this document, are you
8 expressing an opinion on the sufficiency of the
9 application with regard to facility access?

10 A I'm -- I'm expressing the -- the opinions that
11 are contained on Page 26.

12 Q And does that section make reference to
13 330.63(b)(1)?

14 A Yes, it does.

15 Q And so are you expressing an opinion on
16 compliance with that regulation?

17 A Yes.

18 Q What qualifications do you have to evaluate the
19 sufficiency of facility access control?

20 A The access control?

21 Q Yes.

22 A Well, I have -- I have described the -- the --

23 Q And what background do you have to offer that
24 sort of opinion?

25 A The -- I have worked with landfill permits for

1 a number of years. This is -- access control by
2 perimeter fence is the typical method.

3 Q And has your experience been dealing with the
4 geotechnical aspects of landfills?

5 A Among other things.

6 Q Have you evaluated operational controls and
7 compliance with facility access?

8 A Are we talking in general or --

9 Q Is that something you've been specifically
10 tasked with doing?

11 A Are you saying in the -- could you clarify? Do
12 you mean for this project or for other projects?

13 Q For other projects.

14 A Yes, I've looked at access --

15 Q Is that something you've been specifically
16 tasked with being the primary person responsible for?

17 A On this project?

18 Q On this project.

19 A On this project? I've been -- for facility
20 access and -- let me look at this section and see the
21 area that it's covering.

22 Q Uh-huh.

23 A Yes, that was -- that was part of my
24 responsibility.

25 Q And you consider yourself an expert on these

1 issues?

2 A For this -- yes.

3 Q This particular regulation?

4 This particular regulation, you consider
5 yourself an expert with regard to that?

6 A Yes.

7 Q Okay. Let's move on to a different topic.

8 Did you have any -- I'm -- we're going to
9 discuss the borings at the site.

10 Did you have any role in the selection and
11 location -- did you have any role in selecting the
12 location of the borings at the site?

13 A The location of the borings?

14 Q Yes.

15 A No.

16 Q Did you have any role in selecting the depth of
17 the borings at the site?

18 A No.

19 Q Did you have any role in selecting the depths
20 at which the borings would be screened?

21 A Do you mean the piezometers?

22 Q Yes, the piezometers.

23 A No.

24 Q Were you present at the time of the 2013
25 borings?

1 A I was -- I was on site part of the time.

2 Q About how frequently were you on site?

3 A Once a week.

4 Q And approximately how long did that boring
5 project last?

6 A I would -- if memory serves me, it would be
7 somewhere in a four- to six-week period.

8 Q Did you take any field notes during your site
9 visits?

10 A No.

11 Q Did you document your observations during your
12 visits in any way?

13 A No.

14 Q Were any particular standards followed in the
15 preservation of the samples taken during the boring
16 program?

17 A I guess -- you said "particular standards." Do
18 you have -- do you have something in mind?

19 Q Well, first let's ask, were there any
20 particular ASTM standards adhered to in the collection
21 of samples?

22 A In the collection or the preservation?

23 Q In the preservation.

24 A In the preservation, not specifically.

25 Q Were there any other standards that have been

1 established to govern the collection -- the preservation
2 of those samples?

3 A Other than ASTM?

4 Q Yes.

5 A Not specifically.

6 Q Okay. About how many samples were taken
7 directly to the lab from the field?

8 A Directly from the lab to the field, none.

9 Q And taken directly -- I guess, perhaps, I
10 should say -- from the field to the lab?

11 A From the field to the lab? I brought the
12 samples back. I collected those.

13 Q When you say you brought them back, where did
14 you bring them back to?

15 A I brought them back to our office.

16 Q And how -- and so were they then taken from
17 your office to the lab?

18 A Yes.

19 Q How long did they sit in your office?

20 A I don't recall.

21 Q Can -- if samples are not properly preserved,
22 can allowing them to sit out compromise the testing of
23 those samples?

24 A As for certain tests, they can.

25 Q Excuse me?

1 A For some tests.

2 Q For some tests.

3 Have you maintained any of the soil
4 samples?

5 A Maintained?

6 Q Yes.

7 A You mean --

8 Q Kept them.

9 A Oh, kept them? Not that I'm aware of.

10 Q Okay.

11 A I mean, we're talking from -- wait, let me
12 clarify. We're talking from the 2013 program?

13 Q Yes.

14 A From the 2013 program, as far as I know,
15 they're -- we don't have those.

16 Q Is it the -- is it your firm's general practice
17 to discard soil samples?

18 A Eventually on all projects, yes, we discard
19 them.

20 Q Do you have any standard practice for how long
21 you keep those samples?

22 A No. That would -- that would vary from project
23 to project.

24 Q Do you have any chain of custody that you use
25 to track those samples?

1 A When the -- the samples that go from -- that we
2 send to the laboratory, the laboratory assignment sheet
3 serves as a chain of custody.

4 Q Did the driller compile any field logs in this
5 case?

6 A I believe so.

7 Q Did you bring those field logs back to your
8 office?

9 A I may have, on occasion, brought them back. At
10 other times, they may have been sent by some other
11 method.

12 Q Did you use those field logs in any way?

13 A I -- I used the field logs when I logged the
14 samples. I -- I actually wrote over the field logs. I
15 would take the field log and start to describe the
16 sample and just write over top of it in a different
17 color.

18 Q Did you preserve those field logs in any way?

19 A I did not.

20 Q Did you preserve your notes on the field logs
21 in any way?

22 A I did not.

23 Q Did you discard those field logs?

24 A I don't recall discarding them, but I said I
25 didn't preserve them either.

1 Q Do you know what happened to the field logs?

2 A No.

3 Q When you began your work in this matter, were
4 you aware it could become the subject of a contested
5 case hearing?

6 A In which matter?

7 Q This particular application.

8 A No.

9 Q Do you have prior experience with landfill
10 applications that have undergone a contested case
11 hearing?

12 A Yes.

13 Q So you are familiar with the process in that a
14 contested case hearing is a potential for a landfill
15 application?

16 A I know that it's potential.

17 Q So was there any reason in this case that you
18 thought there was not a potential for a contested case
19 hearing?

20 A Yes. As I testified earlier, I have worked on
21 a number of landfill applications and amendments. Very
22 few of them go to contested case hearing.

23 Q But --

24 A It's not -- it's not the norm.

25 Q Did you feel like there was no potential for

1 that to happen?

2 A No potential? To be honest with you, I didn't
3 evaluate that potential.

4 Q Now, did you participate in the development of
5 the boring logs in this matter?

6 A Of the boring logs?

7 Q Uh-huh.

8 A Yes, I worked -- I did work on the boring logs.

9 Q Did you maintain drafts of those boring logs?

10 A From -- no, I did not maintain drafts.

11 Q Now, according to Mr. Snyder, you observed more
12 of the samples than he did. Would you agree with that?

13 A I observed all the samples. So if he observed
14 anything less than all, that would be correct.

15 Q So were you primarily responsible for
16 documenting any secondary features in the samples?

17 A Yes, I -- I would've looked at all of the
18 samples.

19 Q What significance do secondary features have
20 for a geotechnical engineer?

21 A For a geotechnical engineer, they -- they have
22 little significance.

23 Q What type of significance -- and since you're
24 not a hydrologist, would you have any opinion on the
25 significance of secondary features for a geologist or a

1 hydrologist?

2 A And I'm sorry, you mean for a hydrogeologist?

3 Q Yeah.

4 A No, I really don't. I mean, my task was to
5 log, and, like I said, they -- they don't have
6 significance to my work. But it is required to note
7 them.

8 Q So your understanding is that you're required
9 to note any secondary features you observed?

10 A Yes.

11 Q So in the 2013 boring program, you observed no
12 secondary features in your review of the logs?

13 A I don't recall any. It would be -- if they
14 were observed, they would be noted on the logs.

15 Q So had you observed any, they would've been
16 noted in the logs provided to the TCEQ?

17 A Yeah. My observations are on the logs.

18 Q Including the fact that you observed no
19 secondary features?

20 A I did not write "no secondary features." If I
21 noted them, they will be on the log.

22 Q Were there any secondary features present in
23 the logs taken -- were there any secondary features
24 present in the borings samples taken during the 2013
25 sampling program?

1 A I don't -- I don't recall. I would have to go
2 back and look at each individual log.

3 Q So let me ask you to assume that the logs do
4 not indicate the presence of any secondary features. If
5 the logs do not indicate any secondary features, then is
6 it true that, so far as you know, there were no
7 secondary features present in the log -- in the samples
8 taken during the 2013 boring program?

9 A Yes, that would be correct.

10 Q And as you think back to your memory of
11 observing those samples, you have no memory of observing
12 a secondary feature?

13 A No.

14 Q Who had final review of the boring logs?

15 A Final review would be Mr. Snyder.

16 Q Now, I believe in deposition that Mr. Snyder
17 said that you had final review of the logs. Was he
18 correct -- so you would say that was not a correct
19 statement?

20 A I don't know what he said in deposition.

21 Q Well, if he said that you had final review of
22 the boring logs, that would be incorrect?

23 A Well, like I said, final review, he -- the logs
24 are under his portion, so he is finally responsible.

25 Q In finalizing the logs, are you comparing the

1 soil classifications to your lab reports?

2 A Well, that's how the soil classifications are
3 derived, from the lab reports.

4 Q Do you have any quality assurance or quality
5 control policies or procedures?

6 A Do I have --

7 Q Let's back up.

8 By "you" I mean, does Burge-Martínez have
9 any quality assurance or quality -- does -- does
10 Biggs & Mathews have any quality assurance or quality
11 control procedures?

12 A Procedures, yes. We have procedures of the way
13 we do things.

14 Q Are those documented in any way?

15 A Are you saying are there written procedures?

16 Q Yes.

17 A No, I do not have written procedures.

18 Q So you have no written quality assurance or
19 quality control procedures?

20 A Not -- and we are speaking specifically of
21 which topic?

22 Q Yes. Specifically to the evaluation of soil
23 samples in the development of boring logs.

24 A No, I do not have written procedures for that.

25 Q For quality assurance or quality control?

1 A For either quality assurance or quality
2 control.

3 Q Now, let's look at EP-4. And I would ask you
4 to turn to Page 123.

5 JUDGE BELL: I'm sorry. What page?

6 MR. ALLMON: EP-4, Page 123.

7 JUDGE BELL: Thank you.

8 A Okay.

9 Q (BY MR. ALLMON) Is this the boring log for
10 Boring No. BME-31?

11 A Yes, it is.

12 Q And let me jump back for just a second. Do you
13 have any unwritten quality assurance or quality control
14 procedure that would produce a verification of what --
15 how the process occurred?

16 Let me just ask, do you have any unwritten
17 quality assurance and quality control procedures?

18 A I guess, yeah, the procedures I use would be
19 unwritten.

20 Q Are those standardized in any way within the
21 firm?

22 A Within the firm? Well, actually they are,
23 since I'm the only person that does this.

24 Q So you're the only person that -- well, I
25 thought that Mr. Snyder also played a role in the

1 evaluation of the boring logs?

2 A He plays a role in looking at them and
3 evaluating them, and we discuss them. So that's part of
4 my procedure, is to discuss the samples and look at them
5 with him.

6 Q So do you have standardized quality assurance
7 and quality control procedures between everyone in the
8 firm that may perform this type of evaluation?

9 A That would be me.

10 Q What about the development of the boring logs,
11 which, as we discussed, Mr. Snyder is also involved in?

12 A Yeah. I do not have a written procedure for
13 his portion of that.

14 Q Do you have any unwritten quality assurance and
15 quality control measures for the development of the
16 boring logs?

17 A Yes. We have the -- we have the standards or
18 the procedures that we have developed in doing this
19 together for the last 25-some-odd years.

20 Q Now, even if the standards are unwritten, do
21 you produce any type of verification document that those
22 procedures were followed?

23 A That the procedures were followed -- a
24 verification?

25 Q Uh-huh.

1 A No, I don't produce a document, other than the
2 log itself.

3 Q But no separate document showing what the
4 procedures were and how they followed your cue --
5 quality assurance and quality control measures?

6 A No.

7 Q So looking at Page 123, is there some lab
8 analysis shown just before the 20-foot depth? Just
9 around the 21-foot depth?

10 A Yeah. It would probably line up with sample
11 U12.

12 Q Okay. Does this include a liquid limit?

13 A Yes, it does.

14 Q And is this interval classified as CH?

15 A The interval is.

16 Q And what does CH stand for? What does that
17 indicate?

18 A CH is a classification of clay.

19 Q Is that classification consistent with the
20 liquid limit lab result here?

21 A Not with this particular sample.

22 Q Okay.

23 A But that class- -- but that classification
24 represents the entire -- see all the samples in that,
25 it's representative of all the samples.

1 Q But it is not consistent with this particular
2 sampling result?

3 A With this particular sample result, the liquid
4 limit would have to be 50 or greater, and it's slightly
5 below that.

6 Q If we were to classify that consistent with
7 this liquid limit, shouldn't that be CL?

8 A Yes, that sample within that are interval,
9 would be CL.

10 Q Which is different than CH?

11 A Which is different than CH. Yet, if I were to
12 classify, based on my observations, the entire area as
13 CH -- as CL, that would be misrepresenting that
14 material.

15 Q But would it not be possible to separate this
16 into separate intervals to reflect the presence of CL
17 within this particular layer?

18 A It would not be really thick enough to do that.
19 I mean, it would be confusing when you go through in
20 these materials and you have one -- you have to
21 remember, on a liquid limit test, the 46 is -- like I
22 say, it is near borderline. To see that is not totally
23 uncommon, to see a random one that falls below. But it
24 doesn't -- it serves no benefit to try to break all
25 those out into some type of a separate layer.

1 Q Where is the nearest actual lab test performed
2 below this depth?

3 A There's not one in this particular boring.

4 Q Where is -- is there any other lab test that
5 was performed above this depth?

6 A Not in this boring.

7 Q So is this the only lab test we have for that
8 interval from approximately 17 feet in depth?

9 A Yes, that's the only one from that interval.

10 Q So the only lab test for this interval would
11 indicate CL?

12 A Correct.

13 Q And you've classified this entire interval as
14 CH?

15 A Yes, that is correct.

16 Q Okay. In your opinion, is CL present at least
17 at that 20 -- approximately 21-foot depth?

18 A It was present at that depth.

19 Q Okay. So insofar as CH indicates -- as far as
20 the label of CH there, I'm looking around 19 feet of
21 depth, indicates that CH is the type of soil present all
22 the way from 18 feet to approximately 52 feet, that is
23 not entirely accurate?

24 A That CH is -- no. The unit, the whole unit is,
25 as a whole, classified as CH.

1 Q But that is -- doesn't accurately characterize
2 each layer of that unit?

3 A It does -- there was -- that one area where we
4 tested would test out as a CL.

5 Q And you didn't test any other areas to
6 determine whether they also would be CL?

7 A Not in that boring.

8 Q Okay. So what was your basis for categorizing
9 the entire layer as CH when the only lab test you
10 performed indicated CL?

11 A If you would look in the layer two materials --
12 and let me take you to --

13 Q Well, let me rephrase my question.

14 Was there anything in this boring, looking
15 at the samples in this boring, that would indicate that
16 this was CL instead of CH?

17 A That would indicate it was CL?

18 Q Yes.

19 A Instead of CH?

20 Q Yes.

21 A No. What would -- the description here is
22 based on -- all of these samples in this boring were
23 similar and looked like the samples in the surrounding
24 borings, where those other lab tests were -- the vast
25 majority classified as CH. The random CL that is

1 borderline in the middle of all those is not noteworthy
2 or does not change the whole interval.

3 Q Well, this is the only lab test we have in this
4 boring. Correct?

5 A But it's not the only sample from the boring.
6 I used my experience and judgment. I looked at all the
7 other samples. I compared the other samples to all of
8 the surrounding samples that classified as CH.

9 Q And what standard did you use in terms of
10 selecting which portions of a boring to send off to
11 sample?

12 A I tried to get a distribution spatially, both
13 vertically and horizontally.

14 Q And so -- but in this, we have a boring that's
15 a total depth of approximately 85 feet?

16 A Yes.

17 Q And you decided that having one sample at
18 around 22 feet would vertically represent and enable you
19 to characterize that entire boring?

20 A Plus what I had horizontally from the other
21 borings.

22 Q Now, other than lab tests, how do you
23 distinguish between CL and CH?

24 A Well, as far as if you don't have lab tests,
25 you have to look at the sample and compare it to what

1 you do have lab tests on.

2 Q Are you -- if you just are looking at a piece
3 of soil, is there any way to definitively determine
4 whether something is CL or CH, other than running a lab
5 test?

6 A Some of the soils are obvious. Some are either
7 one direction or the other. A lot of them within the
8 borderline you may look at it and think it's one, and
9 you get the test back and it's just across the line,
10 becomes the other.

11 Q So visual observation can't necessarily tell
12 you whether something is CL or CH?

13 A Not always.

14 Q At the 23-foot depth, do you know whether this
15 sample visual observation would allow you to determine
16 whether it was CL or CH?

17 A I don't remember the particular sample or why I
18 pulled that one out.

19 Q And I guess we can't determine that because the
20 sample has been discarded. Is that correct?

21 A I don't think, if we had a sample, I could
22 determine why I pulled it out.

23 Q Okay.

24 A I would suspect that -- as I say, as I've tried
25 to give a distribution of samples, this was just one to

1 add to the -- to the mix.

2 Q That's -- but you just said that's your
3 suspicion.

4 A What is my suspicion?

5 Q Your suspicion that this was just one sample --
6 well, you just said that you would suspect this was just
7 one sample to add to the mix. What do you mean by that
8 statement?

9 A Well, you're asking why I pulled this
10 particular sample. I said my suspicion -- or I would
11 suspect that this sample was because as I was placing
12 samples around the site and trying to get a good
13 distribution to characterize the whole soil matrix, it
14 seemed appropriate to have one in this location.

15 Q Now, my understanding is Mr. Snyder described
16 you as responsible for the final revisions to the logs,
17 because you're the one looking at the geotechnical data
18 for classification.

19 A Yes, for final revisions.

20 Q For final revisions. So your final revisions
21 are based on this geotechnical lab data?

22 A Yes.

23 Q And in this case, the geotechnical lab data
24 contradicts the CH, which is indicated for this
25 interval?

1 A Yes. And that's why it is important to have
2 someone experienced look at these and log these. You
3 can't just take the data and plug it in because it would
4 lead to a misrepresentation on the logs of the actual
5 materials there.

6 Q But in other cases, did you not decide to
7 review, say, what was noted in the initial logs based on
8 the lab data?

9 A Review what was --

10 Q Did you -- in reliance on the lab data, did you
11 not alter the classification of boring -- of soils
12 present in other borings?

13 A On this?

14 Q In other borings. Generally, as you reviewed
15 the borings, were there instances --

16 A We are talking about the 2013 borings --

17 Q Yes.

18 A -- for 130EP?

19 Q Yes.

20 A In other cases did I change or review?

21 Q Yeah. Were there other cases where you
22 obtained the laboratory data and that informed your
23 opinion so as to alter the characterization of the soil?

24 A I don't recall that. You know, the actual
25 classification, where I put the CH, I don't put those on

1 until after I get the lab data back. So in this case, I
2 can say is, as I was adding the classifications and I
3 got to this one, even though it classified as a CL,
4 after I had looked at all the material, that was
5 classifying the whole -- since this material was so
6 similar to the CHs that were abundant all around it,
7 this CL would actually -- as I say, would be -- would
8 not be typical of that whole -- of that whole depth.

9 Q But this is the only empirical data we have for
10 this particular boring?

11 A For that boring, yes.

12 Q And in your opinion, is CL present at that
13 approximately 23-foot level where this sample was taken?

14 A The sample at that -- that particular sample
15 did classify as a CL.

16 Q So that soil at that depth was CL?

17 A Oh, likely, that soil in that sample was a CL,
18 based on that test. Now, you also have to realize that
19 on Atterberg limits test, there is a -- on -- there is
20 an acceptable zone. You could run the test again, and
21 it could fall on the other side of the line.

22 Q Now, given that that soil at that level is more
23 likely than not CL, to the degree that your label here
24 of the interval from 18 feet to 53 feet indicates that
25 entire area is CH, that characterization of the interval

1 would be incorrect. Is that correct?

2 A No. My characterization that I put is correct.

3 Q It's -- but is it correct -- does it correctly
4 indicate the type of soil present throughout that
5 interval?

6 A Yes.

7 Q But you just told me that there's CL present at
8 the 23-foot --

9 A You said "throughout."

10 Q Yes.

11 A From top to bottom, that, as a matrix, the
12 entire -- looking at it as a whole, would be CH. Now,
13 within the CH there's evidently -- there could be a clay
14 that would be CL.

15 Q So you're not intending to somehow indicate
16 that CH characterizes the soil at each layer of that
17 interval?

18 A I think definitely that's what I am intending.

19 Q Is that consistent with there being CL present
20 within that interval?

21 A Yes.

22 Q So on the one hand you're saying that the soil
23 is CH throughout the entire interval?

24 A The interval is CH.

25 Q Throughout?

1 A Yeah, that is the dominant material.

2 Q Is it the material -- when you label it CH, are
3 you indicating that is the material throughout that
4 interval?

5 A That is the classification of the dominant
6 material throughout that interval. That describes that
7 interval.

8 Q And I understand you're saying "dominant." I'm
9 asking you, is that a characterization of material
10 throughout that interval?

11 A Yes, throughout that interval, the dominant
12 material is CH. Now, I guess, are you asking can there
13 be a different material within there?

14 Q Yeah, I'm not asking what the dominant material
15 is. I'm not asking what's present --

16 A Well, that's the purpose of the log. That's
17 what the log shows.

18 Q Is it not possible to -- would it not be
19 possible to separate this layer into -- this interval
20 from 20 feet to 53 feet into smaller layers?

21 A It would be possible. But my -- obviously, my
22 visual review, I didn't think it would be appropriate.

23 Q And if this were separated to show an interval
24 of CL at approximately that 23-foot level, would that be
25 a more accurate representation of what particular soils

1 are present at each depth?

2 A No, I don't believe so. That's why I didn't do
3 it.

4 Q Now, why did you bother sampling this depth if
5 you didn't feel like the sample results would determine
6 your characterization of it?

7 A If I didn't feel the sample results would
8 determine a characterization?

9 Q Yeah. Why did you bother to sample at this
10 depth if you were going to simply put aside results
11 inconsistent with your characterization of it as CH?

12 A As I told you before, I have a large property
13 with lots of borings on it. I don't want to sample just
14 one area. I try to spatially get samples from a lot of
15 areas so that all of the samples together can help me
16 characterize the materials.

17 Q So essentially you took what you had found in
18 other borings and superimposed it onto this boring?

19 A No. What I found in other borings helped me
20 identify. Once I know that the material would classify
21 as a CH, then as I visually look at it, I know what a CH
22 on this site looks like.

23 Q Were pebbles present in any of the borings?
24 I'm moving on.

25 A Oh, okay.

1 Q Were pebbles present in any of the borings at
2 the site?

3 A Well, I'm looking at this -- at this log in
4 front of me, and at the upper portion it says "with
5 pebbles."

6 Q And is that consistent with most of the borings
7 at the site?

8 A I don't remember how many -- I remember there
9 were pebbles.

10 Q Do you want to review -- since we have these in
11 front of you, do you want to look over a few of the
12 boring logs?

13 A Okay. And what do you want me to look for?

14 Q Pebbles.

15 A Okay.

16 Q Were pebbles generally present in many of the
17 boring logs at the top? And perhaps we can speed this
18 on. I will rephrase my question.

19 Were there pebbles present in any of the
20 boring logs at the site?

21 A Yes.

22 Q And did that impact the ability to take an
23 undisturbed sample?

24 A Where the pebbles were, it does.

25 Q And how does that impact the ability to take in

1 undisturbed samples?

2 A A lot of times the sampler cannot -- if there's
3 too many of them, the sampler cannot get through them.

4 Q Did those pebbles on occasion result in bent
5 Shelby tubes?

6 A I didn't witness it bending the Shelby tubes,
7 but they absolutely could.

8 Q And I guess, for context here, what is a Shelby
9 tube?

10 A A Shelby tube is a thin-walled sampler. It is
11 basically a metal tube that is pushed into the soil to
12 retrieve a sample.

13 Q And if you have a bent Shelby tube, are you
14 able to recover a sample from that -- an undisturbed
15 sample from that area?

16 A If you bend the Shelby tube?

17 Q Yeah.

18 A You can at times. It's according to how it
19 bends.

20 Q Now, do you know if Shelby tubes were bent at
21 deeper intervals beneath where pebbles were present?

22 A I don't recall any.

23 Q Is that something that would've been noted in
24 the logs?

25 A If the -- if the tube was bent?

1 Q Yes.

2 A I don't recall. But see, you have to remember,
3 I would be looking at the sample when I see the sample.
4 So if the tube was bent, I can tell in the shape of the
5 sample.

6 Q Okay. Now, is that type of information
7 that's -- is knowing that the Shelby tube was bent at a
8 particular point, is that useful information in
9 characterizing the material present?

10 A Not particularly when you have the shallow
11 pebbles, because you already know what they are.

12 Q Right. So when you're at a deeper level, and
13 you see a bent Shelby tube, does that provide you
14 helpful information in the characterization of the
15 material?

16 A That if I see a bent tube?

17 Q Yes.

18 A It pretty much tells me that the sample is very
19 hard, very dense.

20 Q And now -- but is that the type of thing that
21 would be recorded in field logs?

22 A That a tube is bent?

23 Q That a tube is bent.

24 A Not always.

25 Q But generally, if it were to happen, is a field

1 log where you would see that recorded?

2 A If they recorded it, I guess I would see it.

3 Q Okay. And once those field logs are discarded,
4 there's not an ability to go back and double-check where
5 that may or may not have happened?

6 A Where a tube was bent?

7 Q Yes.

8 A I could look at the samples.

9 Q And if you have discarded the samples and the
10 field logs, you don't have a way to go back and
11 double-check?

12 A To see where a tube was bent?

13 Q Yes.

14 A No.

15 Q Now, what was the name of the driller during
16 the 2013 boring program?

17 A The company?

18 Q The individual.

19 A Stefan Stamoulis.

20 Q And was he also the driller during the 2016
21 program?

22 A Yes.

23 Q Okay. Were you or Stamoulis measuring push
24 versus recovery to determine how much recovery you were
25 getting?

1 A During which program?

2 Q During the 2013 program.

3 A 2013? I was not.

4 Q And when we say "push" in this context, what
5 does "push" refer to?

6 A I don't know. You used it.

7 Q Well, I'm asking you, as a geotechnical
8 engineer with experience, how would you define "push"?

9 A Push?

10 Q Uh-huh.

11 As we're performing a boring program, when
12 you're looking at measuring push versus recovery, as
13 we're in the field, what does push -- does push have a
14 common meaning in the field?

15 A I don't know. It's not a term that I've
16 actually ever used.

17 Q Is it a term you're familiar with being used in
18 the field?

19 A As far as push? I guess you have to -- maybe
20 to push a tube. Maybe someone would you say that.

21 Q So is it essentially how far a tube goes down
22 in relation to the amount of pressure being placed on
23 the tube?

24 A Okay.

25 Q I'm asking you, is that your understanding of

1 essentially what it refers to?

2 A Yeah, I'll -- I'll accept that.

3 Q Were you obtaining 100 percent recovery in your
4 samples?

5 A Generally not a hundred percent.

6 Q Did you document where you didn't have a
7 hundred percent recovery?

8 A No, I did not.

9 Q Would that provide useful information?

10 A Not particularly to me.

11 Q If you don't have 100 percent recovery, can
12 that result in gaps in the characterization?

13 A In the characterization? In some -- in some
14 formations it might.

15 Q But do we have any indication in these logs of
16 where that may have been the case?

17 A No. Because on these logs, to be able to get
18 the sample numbers in there, it's -- we show the
19 interval that was sampled.

20 Q Did you send any samples with pebbles in them
21 to the lab for sampling?

22 A I don't recall sending any.

23 Q Was the Shelby tube method generally used in
24 the sampling at this site?

25 A It was -- yeah, it was used mostly. There were

1 some at the surface. Some of the samples, sometimes we
2 only augered.

3 Q Now, will the Shelby tube method bring pebbles
4 to the surface, if those pebbles are larger than the
5 inner diameter of the sampler?

6 A No, I don't believe that could happen.

7 Q Was the split-spoon method also used at the
8 site?

9 A Yes, I believe it was.

10 Q Will the split-spoon method bring pebbles to
11 the surface, if those pebbles are larger than the inner
12 diameter of the sampler?

13 A Only if it fractured them.

14 Q Was ferrous staining present in the samples?

15 A Excuse me? I did not hear you.

16 Q When we're looking at the sampler at a boring
17 log, the term "ferrous sampling" I've seen -- "ferrous
18 staining" I've seen used in case -- certain cases.

19 A Yes.

20 Q What does ferrous staining -- what does that
21 mean?

22 A It's -- it's iron. It stains -- you see red,
23 rust colored, basically, stains.

24 Q So that's basically where oxidation has
25 occurred within the formation?

1 A Yeah. But, I mean, I'm not telling you how it
2 got there. I'm just telling you that's what I observed.

3 Q Is that an indication of oxidation?

4 A I assume if it's rust colored and iron -- when
5 it -- when oxidation occurs, that's rusting.

6 Q Does that provide any indication as to the
7 presence of water at any time in that unit?

8 A It doesn't to me. But you're getting more into
9 a geology question instead of a geotechnical question.

10 Q So as you look at a boring, you wouldn't be
11 able to evaluate that?

12 A I don't, as far as has water been there or not.

13 Q And is the same true for -- was there gypsum
14 present in some of these borings?

15 A Yes, I believe there was.

16 Q And would you likewise be unable to determine
17 the significance of that from a -- in evaluating the
18 potential presence of water?

19 A Yeah, I wouldn't -- I wouldn't evaluate that.

20 Q Now, we've been talking about the 2013 program.
21 Now, let's turn to the 2016 program.

22 A Okay.

23 Q Were secondary features observed in that
24 program?

25 A Yes.

1 Q Why -- do you have an opinion as to why there's
2 a discrepancy between the observation of secondary
3 features in the 2016 program versus the total absence of
4 secondary features recorded in the 2013 program?

5 MR. RYAN: I'll object to the form of the
6 question. It's certainly not true that there were no
7 secondary features observed during the 2013 boring
8 program. And frankly, I think Mr. Allmon knows that.

9 MR. ALLMON: Let me rephrase the question.

10 JUDGE BELL: Okay.

11 Q (BY MR. ALLMON) So were there fractures
12 observed in the 2016 program?

13 A Yes.

14 Q Were there fractures observed in the 2013
15 program?

16 A I don't recall.

17 Q You don't re- -- well, let me ask, is there
18 anything in here that you can check to see if fractures
19 were observed in the 2013 program?

20 A We can look through all the borings.

21 Q Now -- but -- so could you -- do you have
22 exhibit -- are Protestants' exhibits up there at the
23 table?

24 Well, do you have Exhibit P-22? It should
25 be up there.

1 MR. RYAN: Gregg, I think it might be in
2 the blue folder.

3 Q (BY MR. ALLMON) Exhibit P-22.

4 A 22?

5 Q Yes, Exhibit P-22. And let me ask you to turn
6 to Page 19.

7 A No, I must not have it. The 22 I have only has
8 seven pages.

9 Q Excuse me. You do have a Page 19 of
10 Exhibit P-22?

11 A No.

12 JUDGE BELL: Let's go off the record for a
13 second.

14 (Break: 10:23 a.m. a.m. to 10:42 a.m.)

15 JUDGE BELL: Mr. Allmon, are you ready?

16 MR. ALLMON: Yes, Your Honor.

17 JUDGE BELL: All right. We're back on the
18 record after a short mid-morning break. And we will
19 continue with cross-examination of Mr. Adams by TJFA and
20 EPICC.

21 Q (BY MR. ALLMON) Okay. Mr. Adams, now you got
22 Exhibit P-22 in front of you?

23 A Yes. I have an exhibit that's marked, yeah,
24 Protestant 22.

25 Q Okay. Could you turn with me to Page 19 of

1 that document?

2 And generally the term is pronounced
3 "protestant"?

4 A I know.

5 Okay.

6 Q And -- well, what is Exhibit Protestant 22?

7 A It's a letter to Mr. Steve Odil with the TCEQ,
8 in regards to the 130 Environmental Park, Caldwell
9 County response to second NOD for land use compatibility
10 determination and submittal of complete Parts I, II,
11 III, and IV, Permit Application.

12 Q So this is correspondence from Biggs & Mathews
13 to the Executive Director responding to one of their
14 notices of deficiency?

15 A Yes.

16 Q And turn with me, please, to Page 19. And do
17 you see there where there is Item 54 listed on Page 19?

18 A Yes.

19 Q What was the -- is the language immediately
20 after the 54 -- is that a restatement of the critique,
21 I'm going to say, offered by the Executive Director?

22 A Yeah, that would be the comment.

23 Q And in 54, what was the comment by the
24 Executive Director Staff?

25 A "The descriptions of Stratum II and Stratum

1 III, in Sections 4.2.2 and 4.2.3 state that very little
2 evidence of fractures or slickenside was observed.
3 Please revise these statements to clarify whether
4 fractures or slickensides do exist in the strata at the
5 site and to what extent."

6 Q And what was the response of Biggs & Mathews to
7 that comment?

8 A "Sections 4.2.2 and 4.2.3 have been revised to
9 clarify the presence of slickensides in one boring and
10 the lack of fractures in Stratum II. Fractures and
11 slickensides were not observed in Stratum III."

12 Q So upon revision, it was indicated -- and this
13 is with regard to the 2013 boring program, that there
14 were no fractures in Stratum II or Stratum III?

15 A Yes.

16 Q But fractures were observed in the borings as
17 part of the 2016 boring program?

18 A Yes.

19 Q Do you have an opinion as to the reason for
20 that discrepancy between the observation of no fractures
21 in Stratum II and III in 2013 versus the observation
22 of -- I believe, was it approximately 19 fractures in
23 2016?

24 A I don't know how many.

25 Q But there were fractures observed?

1 A Yes.

2 Q Do you have an opinion as to the reason for
3 that discrepancy between the observation of fractures in
4 2016 and the observation of no -- these -- the -- that
5 there were no recorded fractures in 2013?

6 A Yeah. In -- in -- I guess, I -- I don't know
7 about the term "discrepancy." And the reason is,
8 fractures were not encountered in the borings in the --
9 in 2013, and they were encountered in the borings that
10 were done in 2016.

11 Q And is there some sort of explanation related
12 to the nature of material at the site that would explain
13 why you would find fractures in 2016 versus not finding
14 those fractures in 2013?

15 A I -- I wouldn't have an explanation, or, like I
16 say, I wouldn't -- it doesn't surprise me.

17 Q And why does it not surprise you?

18 A It wouldn't -- because I would not have a
19 expectation to find them. I mean, we didn't find them
20 in 2013. I was not surprised that we found some in
21 2016.

22 Q Well, just to clarify, you did find them in
23 2016 -- you did find fractures in 2016?

24 A Yes.

25 Q But you have no recorded fractures in 2013?

1 A Correct.

2 Q Which would indicate you observed no fractures
3 in 2013?

4 A Correct.

5 Q What about the geology at the site would
6 explain the observation of fractures in 2016 versus the
7 observation of no fractures in 2013?

8 A I don't have an opinion about the geology of
9 the site.

10 Q So you don't have any explanation or any
11 opinion as to why you would observe fractures in 2016
12 versus no observed fractures in 2013?

13 A No. You -- and you asked me, like I said, I
14 wasn't -- they weren't during -- encountered in the
15 borings from 2013. And the few borings that were
16 drilled in 2016, when I saw fractures, I wasn't
17 surprised.

18 Q Okay. Could you turn with me -- well, we've
19 reviewed the borings. Do you agree with me that there's
20 gravel present throughout much of the site in the top
21 4 to 6 feet?

22 A Yeah. I don't think we called them pebbles
23 before, but gravel, definitely gravel.

24 Q Gravel or pebbles?

25 A Gravel size.

1 Q Now, is soil with such gravel in it appropriate
2 for use as the bottom liner for this landfill?

3 A The criteria on it -- for the bottom liner
4 and -- would be no particles larger than 1 inch.

5 Q Can you turn to me with [sic] Page 130EP-3,
6 Page 67?

7 A Yes.

8 Q Does this provide the standards for the soils
9 to be used in the compacted soil liner?

10 A This lists the standards, yes.

11 Q And when we use the term "compacted soil
12 liner," what are we referring to at the landfill?

13 A When you use the term "compacted soil liner,"
14 we're referring to the -- the lower element in a
15 composite liner. Now, in this particular landfill, we
16 have what we denote as a Subtitle D liner, because that
17 is a prescribed liner by the regulations. That lower
18 element consists of 2 feet of clay. The clay is
19 compacted in four individual lifts, at controlled
20 moisture and density.

21 Then we have to meet a minimum
22 permeability requirement -- actually a maximum
23 permeability requirement. It can't exceed one times ten
24 to the minus seven. And so that is what the compacted
25 soil liner refers to.

1 Q Now, in your -- does this allow the use of --
2 does this allow that the soil used in that liner may
3 contain rocks up to 1 inch in diameter?

4 A Does this?

5 Q Yeah. As we look at 7.2 on Page 67, the first
6 sentence there, does that allow for rocks up to 1 inch
7 in diameter to be used within that soil?

8 A Does it allow -- it is -- up to 1 inch?

9 Q Uh-uh.

10 A Yes, you can have some rocks up to 1 inch.

11 Q Now, if we have -- what does the term
12 "isotropic" mean?

13 A I would say isotropic would mean something
14 would be consistent, both horizontally and vertically.

15 Q In your geotechnical evaluations, did you
16 assume that the liner would be isotropic?

17 A Yeah, it would be consistent.

18 Q If we have rocks up to 1 inch in diameter
19 interspersed randomly amongst the clay in that liner
20 material, is it isotropic?

21 A Yes, as a unit it will be.

22 Q But do the characteristics of the soil vary in
23 the areas where you would have a rock versus the area
24 where you don't have a rock?

25 A Of the soil?

1 Q In the soil.

2 A No. If you have a 1-inch rock embedded in the
3 clay, it doesn't change the characteristics of the -- of
4 the whole mass.

5 Q But if we were to look within the mass, the
6 characteristics of that material where you have a rock,
7 within that rock is different than the characteristics
8 where you have just clay?

9 A Yeah, you would have a -- you would have a
10 harder spot.

11 Q And when I say "characteristics," I'm talking,
12 like, shear strength. The shear strength of this rock
13 is different than the shear strength of just clay?

14 A Yes.

15 Q So to the degree that isotropic is assuming a
16 wholly consistent quality of material, when you've got
17 rocks mixed in, it is not entirely isotropic?

18 A Well, you talked about -- I would say it would
19 be generally isotropic. It would generally be the same
20 in each direction, as long as the same material was
21 used.

22 Q But -- so as far as just the straightforward --
23 as far as just being isotropic, it is not, in a
24 straightforward sense, isotropic?

25 A It's not precisely isotropic.

1 Q There's some variance from -- if we were to
2 assume that it's isotropic, the actual quality of the
3 soil varies somewhat from that assumption?

4 A By nature of the quality of soil, there is some
5 variance in it.

6 Q Do you propose -- does the Applicant propose to
7 use on-site soils as material for, say, the liner or the
8 cover material at the site?

9 A I would presume that would be the case.

10 Q Did you -- did you or anyone else that you're
11 aware of perform a soil balance to determine whether
12 there was adequate material present?

13 A I don't recall one. In the process of
14 designing the excavation, we may have determined how
15 much soil -- how much excavation required. But as far
16 as a formal soil balance, I don't remember doing one.

17 Q Now -- so there's no documented soil balance
18 anywhere?

19 A No, I don't think so.

20 Q And you're not aware of anyone else doing the
21 soil balance?

22 A No.

23 Q If there's not adequate soil available in the
24 excavation, would the Applicant need to obtain soil
25 otherwise?

1 A Yeah, if you [sic] did not all come from the
2 excavation, it would have to come from some other
3 source.

4 Q And generally, would you need to have borrow
5 pits to obtain that soil?

6 A That's one method.

7 Q Do you have -- do you have any idea where the
8 borrow pits would be located for this landfill?

9 A No.

10 Q Is there a floodplain covering -- do you have
11 an understanding as to whether there's a floodplain on
12 portions of this site?

13 A Yes, there is.

14 Q And floodplain on nearby -- kind of the larger
15 property the site is located on?

16 A Yes.

17 Q Would it be appropriate to place a borrow pit
18 within the floodplain?

19 A It can.

20 Q If one were to place a borrow pit within the
21 floodplain, would that potentially alter the floodplain?

22 A It would provide more storage.

23 Q But as a geotechnical engineer, do you have any
24 opinion as to whether that would alter the floodplain?

25 A As a geotechnical engineer, no.

1 Q Do you have an opinion as to whether that would
2 alter -- the presence of borrow pits could potentially
3 alter the floodplain?

4 A Would it alter the plain? No, I wouldn't know
5 for this specific case.

6 Q Is it your understanding that the Plum Creek
7 Groundwater Conservation District has an easement on the
8 property?

9 A Yes.

10 Q Would borrow pits be able to be placed within
11 that easement?

12 A I don't know that answer.

13 Q So do you know whether there is adequate area
14 on the site, within the property boundary, where a
15 borrow pit could be placed to obtain additional soil?

16 A I have not analyzed that.

17 Q To your knowledge, has anyone analyzed that?

18 A I don't know if they have or not.

19 Q Now, yesterday you were asked some questions
20 related to the soil balance, and, as documented, I think
21 you stated, "There are soils on site that fit these
22 purposes, being the liner inside." And you continue to
23 say, "As far as the detailed soil balance and how much
24 soil goes into each one, no, I have not done that, as
25 far as excavation. And I'll just give you a typical

1 rule of thumb, it didn't fit a landfill this irregular.
2 But generally, if you dig -- if you're about one-third
3 excavation and two-thirds aerial, it kind of works out."

4 Do you generally remember that response?

5 A Yes.

6 Q You used the term -- you said that that rule of
7 thumb didn't fit a landfill this irregular. What did
8 you mean by the term "irregular"?

9 A The shape -- the shape of the landfill.

10 Q In what way is the shape of the landfill
11 irregular?

12 A It's not a rectangle.

13 Q Now, is the shape of the landfill, in terms of
14 the amount aboveground versus belowground, irregular,
15 above the natural ground surface and below the natural
16 ground surface?

17 A The shape?

18 Q Well, the configuration of the landfill.

19 A Well, yeah, naturally by -- if the footprint or
20 the perimeter of the landfill is irregular, then as you
21 place -- as you cut down, that's reflected in the -- in
22 the excavation and the aboveground portion.

23 Q Is the depth in comparison -- is the depth
24 below ground surface, in comparison to the quantity of
25 waste to be placed above natural ground surface,

1 irregular?

2 A Irregular? Depth? I don't know how I would
3 describe depth as irregular.

4 Q So that's not what you were referring to when
5 you used the term "irregular" yesterday?

6 A Yeah.

7 Q But the shape of the footprint is what you
8 would consider irregular?

9 A Yes.

10 Q Does that impact the ability to construct the
11 landfill in any way?

12 A The shape of the footprint?

13 Q The shape of the footprint.

14 A No, in no way.

15 Q I have heard this landfill, in testimony here,
16 described as an "amoeba-shaped landfill." Have you
17 previously had experience with a landfill shaped similar
18 to this one?

19 A Yes.

20 Q Okay. Let's turn to some of your slope
21 stability analyses. Look with me to Exhibit 130EP-3,
22 Page 78.

23 A Okay.

24 Q Is this appendix, D5B, regarding setting forth
25 your slope stability analysis?

1 A Yes.

2 Q And as we look at Table D5, B1, does that lay
3 out different types of failures that could occur at the
4 landfill?

5 A Those are the conditions that were analyzed.

6 Q Analyzed.

7 Are there -- could there be other
8 conditions that would cause a failure that are not
9 explicitly recognized here?

10 A Other types of conditions?

11 Q Yeah. Is this a comprehensive list of all the
12 different types of failures that occur in terms of the
13 stability of the landfill?

14 A These are the critical ones.

15 Q But are there other ways a failure could occur
16 not listed here?

17 A As far as slope stability goes?

18 Q As far as slope stability goes.

19 A No. I believe these covers the mechanisms.

20 Q Okay. Now, as we look at this, for instance,
21 for the liner veneer, how would you describe a liner
22 veneer failure?

23 A A liner veneer failure would be -- on the liner
24 would be a slide. Either -- in one of the layers of the
25 liner; either the 2 foot of protective cover would slide

1 on the geocomposite, or the geocomposite would slide on
2 the geomembrane, or the membrane could slide on the
3 compacted soil liner beneath it.

4 Q And as we look at the final waste slope, how
5 would you describe a "circular arc failure"?

6 A A circular arc failure would be a -- would be
7 basically -- as it's described, a circular arc failing
8 through the -- through the waste mass.

9 Q Now, are there factors of safety set forth
10 here?

11 A Yes.

12 Q Where do these factor of safe- -- do the TCEQ
13 rules contain any particular factors of safety for use
14 in this analysis?

15 A You mean as far as a requirement?

16 Q Yes.

17 A No.

18 Q Where do these -- when you say "recommended
19 factor of safety" here, where did you derive these
20 recommended factors of safety from?

21 A They were taken from the reference that's
22 listed above the table.

23 Q And which reference is that?

24 A That's the Corps of Engineers Design and
25 Construction of Levees, Manual EM1110-2-1913.

1 Q Does the Corps of Engineers, within that
2 document, anywhere indicate that it's intended for use
3 in evaluating landfills?

4 A Not that I'm aware of.

5 Q Okay. Is a levee an engineered structure?

6 A A levee?

7 Q A levee, yeah.

8 A Yes.

9 Q And by that, do we mean that the entirety of
10 the soil contained within it has been engineered to
11 certain specifications, if done properly?

12 A Well, like I said, we're just talking a
13 definition of a levee?

14 Q Yes -- well, the type of levees addressed by
15 the Corps of Engineers in the this design and
16 construction of levees document.

17 A I wouldn't -- wouldn't have an opinion on that,
18 of what they're defining, if the levee could be a
19 combination of cut-in fill.

20 Q So in applying those recommended safe --
21 factors of safety to this landfill, you didn't look at
22 exactly what the characteristics were of the levees that
23 that manual was intended to address?

24 A No.

25 Q Now, look with me -- let's turn real quickly to

1 130EP-1. So that's a different volume.

2 A Okay.

3 Q And I'm going towards Page 152.

4 A 152?

5 Q Yes.

6 A Okay.

7 Q Is Page 152 a map of the landfill site with the
8 landfill footprint and certain land uses nearby?

9 A Yes.

10 Q Do you see -- on the landfill footprint just to
11 the north, is there a residence there indicate with the
12 yellow square?

13 A Yes.

14 Q Roughly how far is that residence from the
15 landfill footprint?

16 A I can't tell from this drawing.

17 Q Is there a scale? Do you see in the lower
18 right-hand corner a scale?

19 A Yes.

20 Q Are you able to look at that scale and provide
21 an estimate of the distance of that residence to the
22 landfill footprint?

23 A No.

24 Q Would you agree that it's less than 500 feet?

25 A No.

1 Q Is it approximately 500 feet from the landfill
2 footprint to that yellow square?

3 A In that vicinity.

4 Q In the vicinity of 500 feet.

5 If we were to have -- and what's your
6 understanding of the height of the landfill above ground
7 surface?

8 A It depends on where you're taking that
9 measurement.

10 Q Let me ask you to assume that at ultimate
11 height is approximately 170 feet above the ground
12 surface. If we were to have a circular arc failure on
13 the north part of landfill, would it be potential for
14 waste or soil to reach that residence?

15 A I -- I don't know.

16 Q Did you consider that?

17 A To reach the residence?

18 Q Yes.

19 A I would have to go back and look at the
20 circular arc failure that we -- we examined.

21 Q If there was circular arc failure large enough,
22 would it have the potential to reach that residence?

23 A I don't see how that could be physically
24 possible, because there's going to be a screening berm
25 between that residence and that face.

1 Q But if it were of sufficient size, could
2 material reach that residence?

3 A I can't envision that.

4 Q Excuse me?

5 A I cannot envision that. I can't picture that
6 happening.

7 Q Now, as we look at the south end of the
8 landfill, is there -- do you see -- well, first, do you
9 see the blue on this figure represents the floodplain?

10 A Yes.

11 Q Towards the south end, do you see how the
12 floodplain is -- would you describe that as being near
13 the landfill footprint?

14 A On this map it looks near.

15 Q If we were to have a circular arc failure at
16 that southern boundary, could that intrude upon the
17 floodplain?

18 A If you had a circular failure through the --
19 through the final waste slope --

20 Q Yes.

21 A Potentially you could have some -- some
22 material move down there. But that's not really the --
23 I mean, when you have a circular failure, all of the
24 material from the failure zone does not leave the site.
25 We draw it as a circular, but it's actually just a

1 slough. We have a little bit of a rotation at the
2 top -- would you like me to draw you a picture of what
3 one looks like?

4 MR. ALLMON: May I approach, Your Honor?

5 JUDGE BELL: Okay.

6 Q (BY MR. ALLMON) Perhaps a few questions would
7 help to explain what we have.

8 A Okay.

9 Q Could you draw a generalized profile of the
10 landfill with the toe up to the top of the landfill.

11 A (Complies.)

12 JUDGE QUALTROUGH: And we can't see that.
13 So if you can -- yeah. Thanks.

14 THE WITNESS: Do you want me to draw it
15 bigger?

16 JUDGE QUALTROUGH: No. I think it's the
17 angle. We can't -- we see your back --

18 MR. RYAN: We can't see through you.

19 THE WITNESS: I'm sorry. I'm
20 right-handed. I need to stand on this side.

21 Q (BY MR. ALLMON) So -- and what you have drawn,
22 is this the waste containment area?

23 A Yeah, this would be the liner, this lower
24 boundary here. And this would be the cover slope right
25 here. And then you would have the perimeter road.

1 JUDGE QUALTROUGH: Can you say that again.
2 We didn't hear that.

3 THE WITNESS: Let me sketch it up, and
4 I'll identify each part.

5 JUDGE QUALTROUGH: Okay.

6 JUDGE BELL: Perfect.

7 Q (BY MR. ALLMON) And for now, I just want the
8 profile. Do you want to explain what you've drawn so
9 far?

10 A Yeah, let me explain what I have.

11 This line here would represent the top of
12 the landfill. This would be the top, where it becomes
13 flat, what we call the top slope. This would be the
14 four-to-one side slope. We have a four-to-one slope
15 going down below ground surface, and then the bottom
16 liner. So this will represent the liner. This would be
17 the top of the waste. Around the perimeter, there's a
18 road, and it's built up so it's a little higher than the
19 existing ground, like a levee. So that's what this
20 would represent.

21 If you would like to look at a section and
22 true scale, besides my drawing, those are provided --
23 those are provided on Applicant's 130EP-3, Page 30,
24 Page 030.

25 Q And when we have a circular arc failure, could

1 you have a plain of failure essentially that's a
2 semicircle?

3 A Yes.

4 Q And could that go from within the landfill and
5 include the toe of the landfill?

6 A Highly unlikely.

7 Q But could it?

8 A If -- if the materials were -- I mean, yes, you
9 can -- you can draw one through there, but the
10 resistance of the material -- do you want me to show
11 what you're asking?

12 Q Yes.

13 A Okay. So you're asking can you have one like
14 that.

15 Q Yes.

16 A Is that correct?

17 Q And what would happen during -- if we look at
18 this, where we got material here, what would happen
19 during a circular arc failure of that type of material?

20 A You would see this space drop down here, and
21 this material would hump up like that (indicating).

22 Q So you would have material forced up as a
23 result of the failure?

24 A Yes.

25 Q Now, would the addition of -- so we've got kind

1 of -- we've got a rotating block of material. Correct?

2 A Correct.

3 Q Okay. And would additional weight, kind of on
4 the uphill portion of it, make it more likely that
5 you're going to have a failure?

6 A Additional weight on the uphill?

7 Q Uh-huh.

8 A Well --

9 Q Is that one -- would it exert downforce there
10 on that portion?

11 A Yeah. The driving force is from this material
12 up here.

13 Q And if you have weight kind of on the toe and
14 in the bottom force, would that tend to resist the
15 failure?

16 A Yes, that can. It resists -- it creates more
17 resistance along that plane if you have more weight,
18 because the resistance is provided by friction.

19 Q Let me go ahead -- keep that, but I'm going to
20 return to my seat real quick.

21 Are you familiar that there are side slope
22 swales at this facility?

23 A Yes, I am.

24 Q And let me jump back just a second before
25 moving to that.

1 So if we have a failure such as we've
2 described here, could that material potentially move off
3 site, that's being pushed up?

4 A That, I would have a hard time envisioning.
5 And I'll try to talk loud as I go back to this. You
6 will see -- when you see these type of failures, you see
7 at the -- at the bottom of the slope, the materials
8 pushed up there. It doesn't travel -- generally travel
9 laterally.

10 Q But if the arc were large enough and extended
11 off site, the material could move off site?

12 A Yeah. I think we're creating a failure that's
13 so highly unlikely because -- and I have not looked at
14 the geometry. But to get off site, that arc may have to
15 pass actually way back here through the bottom.

16 Q Now, as we looked at the proximity of, say, the
17 floodplain and the residence, was that considered in any
18 way in establishing your recommended safety factor?

19 A In establishing the safety factor?

20 Q Yes.

21 A No. The safety factors are -- standard safety
22 factors are used throughout this industry and others as
23 1.5 and for long-term and 1.3 for short term.

24 Q So in this, you simply applied the same safety
25 factor you would apply at any other landfill?

1 A Yes.

2 Q So, again, are you aware that there are side
3 slope swales at this facility?

4 A Yes.

5 Q Did you factor in those side slope swales in
6 your, say, circular arc failure analysis?

7 A Not in the arc failure analysis.

8 Q Would those swales add weight on the uphill
9 portion -- would those swales add weight to the area
10 that perhaps would fail?

11 A They would -- in portions, they would add
12 weight, but they're also adding weight along the arc,
13 also adds resistance.

14 Q Would modeling be required to determine what
15 impact those would have?

16 A The swales? No. I have -- and I will tell you
17 why that modeling -- each individual swale or the slope
18 with the swales?

19 Q Yeah. Let's review. The modeling that you
20 performed for the circular arc failure did not account
21 for the weight of those swales. Is that correct?

22 A I'd have to go back and look at the model to be
23 specifically sure.

24 Q Okay. Go ahead.

25 A Yeah, the -- the particular model you're

1 talking about is illustrated on 130EP-3, Page 171.

2 Q Yes.

3 A And that -- that is the model that we were
4 looking at as the final waste circular slope.

5 Q Uh-huh.

6 A And the geometry of the individual side slope
7 swale is not included in the model.

8 Q And do you know how many side slope swales are
9 going to be present on the slope of the landfill?

10 A No.

11 Q And you didn't account for any of those?

12 A No. Because they're not critical to this
13 slope. I have done these for the last 23 years. And in
14 the early days when I did them, I did look at each
15 individual side slope, and after learning that it did
16 not matter to the overall -- if you look at the model,
17 the scale of this, and you look at the slope, if you
18 were to plot -- try to plot those 2-foot high swales,
19 you wouldn't be able to see them hardly on this scale,
20 and so they're insignificant. And that is something
21 that years ago, yes, I ran those. As the years have
22 gone by, and I recognize where are the critical
23 surfaces, I kind of narrow it down, and I put the
24 critical surfaces in. And so in this particular run
25 right here, whether the swales are on there or not, it

1 won't make a difference.

2 Q So did you -- but you did no modeling?

3 A Not this time. I have in the past. It's based
4 on my experience of modeling in the past.

5 Q So based on your general experience, you made
6 that determination, not to model those swales?

7 A Based on my specific experience with modeling
8 swales, I made that decision.

9 Q Now, let's turn back to -- what is a veneer
10 failure?

11 A A veneer failure would be a slide along the
12 plane of the -- either the liner or the final cover
13 system.

14 Q Could you turn with me quickly to Page 130EP-3,
15 Page 90?

16 A Yes.

17 Q Well, and perhaps as between 89 or 90, would
18 either of these pages be helpful to you in explaining
19 what a veneer failure is?

20 A I think 89 would be.

21 Q Do you want to go ahead and provide that
22 explanation?

23 A Yes. If you look at the diagram at the top of
24 Page 89, you'll see this would be a final cover
25 system -- or no. It says composite liner. Cover and

1 liner are basically the same when we do these analyses.

2 The -- it's kind of the liner system
3 exploded, so to speak, so you sort of can write the
4 forces in. But on a liner system there, if you'll
5 notice, you have a protective cover, the geocomposite
6 component, the geomembrane, and the compacted soil. We
7 actually looked at the resistance to sliding at each one
8 of those interfaces, and so that's what the purpose of
9 this.

10 Q And in performing your -- and so in performing
11 this analysis for veneer failure at the final slope, did
12 you consider the weight of the side swales?

13 A No, because adding weight actually would
14 increase the factor of safety. So we look at this
15 particular -- at the thinnest portion where the side
16 slopes -- or swales don't exist.

17 Q Now, are you familiar with the design of the
18 swales?

19 A I'm familiar with the geometry of the swales.

20 Q Could you -- are you familiar with where that
21 design is set forth within the application?

22 A Yes. I believe I can find that.

23 Q Could you point to that.

24 A Like most parts of the application, it probably
25 occurs in more than one location. But the closest to

1 where we are right now would be EP-3, Page 49.

2 Q And what is the slope of the -- as we look
3 at -- say we've got the side slope swale. As we look at
4 EP-3, Page 49, is there a cross section there in the
5 upper right-hand corner of a side slope swale?

6 A Yes.

7 Q And what is the slope on each side of the side
8 slope swale?

9 A Two-to-one.

10 Q Did you evaluate the potential for a failure of
11 such a swale?

12 A You mean just through the swale itself?

13 Q Through the swale itself.

14 A No, not --

15 Q And if a swale were to fail, where would the
16 soil from that swale go?

17 A It would -- it would mostly stay right in
18 place. It would -- we call them circular failures, but
19 they are sloughs.

20 Q Now, would that shift soil simply downhill on
21 the site of the landfill?

22 A It would move down.

23 Q And would it move down into the trough above
24 the immediately downhill swale?

25 A No. That would be -- that wouldn't -- there's

1 too much distance, too little soil.

2 Q Well, but would it move within that area that
3 is -- what is generally the distance -- do you have an
4 understanding of the distance between these swales?

5 A No, not on these. I'd have to go back and look
6 at it. But typically the horizontal spacing between
7 them is 100 feet or less.

8 Q Would there be the potential for one of these
9 berms to fail, influencing berms downhill from it?

10 A I can't imagine a failure in these small berms
11 actually influencing the berm downslope.

12 Q Did you do any specific analysis of that?

13 A No.

14 Q And you did no analysis of these one to two
15 slopes on the berms?

16 A Not on this project.

17 Q Not on this project.

18 Did you consider the potential for the
19 soil immediately upstream of these berms to be fully
20 saturated in your analysis?

21 A That is considered. And do you want me to show
22 you how that's considered or just tell you?

23 Q For the moment, just let me ask you.

24 Did you consider fully saturated
25 conditions in your slope stability analysis --

1 A No.

2 Q -- in these areas?

3 A No, because of the presence of the drainage
4 material beneath the soils.

5 Q And why did you not consider it due to the
6 presence of that drainage material?

7 A Because that drainage material will allow those
8 soils to drain. It won't build the pore pressures, and
9 that's its purpose of being in the design.

10 Q As we look at potential for a slope failure and
11 we're looking essentially at different forces going in
12 different directions and seeing if a failure would occur
13 when those become unbalanced. Is that a rough
14 approximation?

15 A Could you say again? Probably so. But tell me
16 again.

17 Q When we're looking at a potential for a slope
18 failure, we're essentially looking at different forces
19 on the soil in the waste?

20 A Yes.

21 Q And seeing if -- kind of, once all those forces
22 are present, whether it would cause the slope to fail?

23 A Yes.

24 Q And is that failure instantaneous, so at a time
25 when those forces are in that state, a failure occurs?

1 A Yes, that's how it would happen.

2 Q So if the water is present, exerting a force at
3 any time, does it then cause a failure?

4 A If it's present at any time, does it cause a
5 failure?

6 Q Yeah. So does the hill always wait for that
7 water to drain before it decides whether to fail or not?

8 A No. If you look -- if you were to -- I mean,
9 that's accounted for in the soil properties, in the
10 weight of the soil.

11 Q But as we look at the side of the slope and
12 look at the potential for a failure, does the water
13 exert weight that influences the potential for a
14 failure?

15 A The --

16 Q The water within these swales?

17 A Within the swales?

18 Q Within the swales. Is that exerting water --

19 A You're talking about the moisture within the
20 swales?

21 Q Well, during a flood -- during a rainfall
22 event, would there be water within these swales?

23 A Are we -- now, let me clear -- are we talking
24 water within the ditch or water within the berm?

25 Q Yeah, water within the ditch, immediately

1 upstream of the swale.

2 A Oh, up top?

3 Q Yeah.

4 A Yes, there would be water. There would be
5 water flowing.

6 Q And would that water be exerting pressure that
7 could influence the potential for a failure?

8 A It would not be significant.

9 Q Did you run any analyses to determine whether
10 it would be significant?

11 A No, because if the water puts more pressure on
12 the soils, the soils then, as told you, adds additional
13 weight. The additional weight adds additional
14 resistance at the interfaces.

15 Q Now, that's for a veneer failure?

16 A Yes.

17 Q What about for a circular arc failure?

18 A Well, then in that case you're saying would I
19 have a circular arc failure back into the slope?

20 Q Yes.

21 A Can I draw that to be sure we're talking the
22 same place?

23 Q Yes.

24 A Not to scale, but to represent the side slope
25 berm. Your question is, is there a potential for a

1 circular arc failure through here back into the slope?

2 Q Well, my question is, looking at the drawing
3 you depicted that we originally drew --

4 A Yes.

5 Q -- we've got swales that are on the side of the
6 landfill?

7 A Yes.

8 Q Yes, right there. And for the moment let's not
9 draw on the figure. Now, those swales, once they
10 contain water, is that weight that can contribute to the
11 circular failure?

12 A It's -- it's weight that goes into the whole
13 system. But you have to remember, the weight has two
14 components. Depending on where it is, it can be driving
15 force, but it is also additional resistance.

16 Q Yeah. So it kind of can serve both roles.
17 It's both a force -- when you say "driving force," what
18 do you mean by "driving force"?

19 A Well, the driving force is the force that wants
20 to push the material down here.

21 Q And to a degree, the water in those swales is
22 providing a driving force to push --

23 A It can provide driving force.

24 Q And I understand what you're saying, is that it
25 also is causing --

1 A A subsequent increase in resistance.

2 Q And you ran no -- and those forces kind of
3 interact in a complex manner. Is that accurate?

4 A Yes. I mean, we -- when you do a slope
5 stability, you look at the forces along the potential
6 slip planes. You don't look up in the section of how
7 they're interacting. It's basically how much -- what's
8 happening along a presumed slip plane.

9 Q And in this case, did you run any modeling
10 considering the potential for a circular arc failure
11 with that water present in the swales?

12 A In the swales?

13 Q Yes.

14 A No, I did not add additional weight for the
15 water in the swales.

16 Q But that weight provides, as you said, a
17 driving force that would be at least one force trying to
18 make a failure happen?

19 A It would be so insignificant, it's just
20 negligible. If you look at the scale of the -- of what
21 we're looking at and the weight of the waste that
22 provides the driving force and the weight of the cover,
23 it's just not -- it's just negligible.

24 Q But you ran no analysis to determine that in
25 this case?

1 A Not in this case.

2 Q Okay. Now, did you use an assumption for the
3 weight? And as we look at that figure immediately
4 behind you on the circular arc failure, the semicircle,
5 kind of, there is the plane where we're having a failure
6 occur. Is that correct?

7 A Yes. That's the plane that we're calculating
8 the factor of safety against the slide at a plane.

9 Q Does that plane go through the waste material?

10 A Let me take you back to the slope stability.

11 Q Yes. And perhaps let's turn back to Page 171,
12 EP-3, Page 171.

13 A Yeah, that would help me find it.

14 Q And as we look at Page EP-3, Page 171, what
15 we're looking at there is a profile of the landfill
16 similar to what you've drawn on the figure behind you?

17 A Yes, that's correct.

18 Q And these black lines and red lines are
19 potential planes of failure?

20 A Yes. If you look -- the green color is
21 actually a series of green lines. Those are all -- for
22 this run, those were all of the surfaces that were
23 analyzed. The black lines represent the 10 most
24 critical of that analysis, and the red line would be the
25 most critical, which in that case was a two-point -- the

1 factor of safety was 2.123.

2 Q And as we look at these lines, do they run
3 through the waste material?

4 A Yes. If you'll look, the analysis of this
5 particular one considered going -- failing through the
6 liner, through the soil beneath. That would be the
7 lower boundary of the green. It would be very shallow
8 failures through the waste. That would be the upper
9 boundary of the green lines. But the critical sections
10 occurred, if you'll look, where the -- the green lines
11 obscure the liner for the most part. But if you were to
12 look along -- and the copy I've got is not as clear. It
13 looks like there is an elevation line. Somewhere
14 between 490 and 560, you can kind of see the remnants of
15 the line underneath it, although the green lines obscure
16 it. You can see that the critical surface is really
17 past through the waste right on top of the liner and
18 then back up.

19 Q And that's what you determined to be the
20 critical surface?

21 A Yes, that was the critical surface. Now, there
22 are many surfaces --

23 Q And --

24 A -- and we narrow it down to critical surfaces
25 for each condition --

1 Q But there are failure planes beneath these that
2 cut significantly through the waste at the site?

3 A Well, yeah, they're analyzed at many points.

4 Q Now, what weight did you assume for the waste
5 at the site?

6 A If you go to Page 81 --

7 Q Yes.

8 A -- the top table in that page, the bottom line
9 says "Solid Waste." To the far right, it says, "The wet
10 weight was assumed to be 60 pounds per cubic feet."

11 Q Will there be any testing to determine the
12 weight of the waste as it's put in place?

13 A Not that I'm aware of.

14 Q Will there be variance in the weight of the
15 waste?

16 A Yes.

17 Q How significant can that variance be?

18 A In the weight of the waste?

19 Q In the weight of the waste.

20 A Are you talking about what is the range?

21 Q Let me ask you: How variable can that weight
22 be?

23 A Within a small distance, it can be quite
24 variable. But within -- you know, within a mass within
25 a lift of 20 feet, it's relatively consistent.

1 Q And did you have to make assumptions, say, for
2 the shear strength of that waste?

3 A Yes.

4 Q Is the shear strength consistent through the
5 waste?

6 A It's not consistent. But for the purposes of
7 the analysis, we have to assume it to be consistent.

8 Q But this would be another area where, say, the
9 facts at the landfill could potentially differ from the
10 assumptions of your analysis?

11 A Yeah, at a point, they could be different.

12 Q Could they be different at a lot of points?

13 A Yeah, they would generally be higher than
14 everything I assumed.

15 Q Okay. And again, could that kind of cut both
16 directions, much like the water that we discussed in the
17 swales?

18 As we say, well, how does the change in
19 weight impact the potential for a failure? As the
20 weight changes, can it potentially make a failure more
21 likely?

22 A Yes. Now, on the circular, because of the
23 geometry we look at, typically in this analysis,
24 increasing the weight of the -- or increasing the shear
25 strength, of course, would increase the factor of

1 safety. Increasing on a four-to-one slope, if the -- it
2 depends on the geometry, but if it passes through the
3 top slope section, increasing the weight would decrease
4 the factor of safety.

5 Q And so decreasing the weight would make a
6 failure more likely?

7 A Decreasing the weight?

8 Q So we've got 60 assumed as the weight.

9 A Right.

10 Q And say it varied up as much as 75. Is 75
11 within the realistic range of what waste might weigh?

12 A Probably really the top end.

13 Q Okay. So if we went up to 75 pounds, how would
14 that generally influence the potential for this type of
15 failure?

16 A If you were able to achieve 75 pounds, which
17 that would be something I have not seen through our
18 space studies and utilization factors, if you could
19 achieve that, you know, the factor of safety may go down
20 a -- I would say in decimal points.

21 Q But you didn't run an analysis to determine
22 that?

23 A No. 60 is a real conservative number. 75 for
24 the whole waste mass would be unrealistic.

25 Q So in looking at likelihood of failure, if we

1 went to 75, are we saying that makes a failure more
2 likely?

3 A If the waste goes up to 75?

4 Q Yeah.

5 A I didn't run 75, but I would think that the
6 factor of safety would be reduced.

7 Q And when we say "reduced," that means that,
8 say, we've right now got a calculation -- is it 1.8 that
9 you've determined?

10 A For this?

11 Q If you'll look with me on Page 78.

12 A On 78?

13 Q Yeah. Generally, are we discussing -- kind of
14 looking at Table D5B1 --

15 A Yes.

16 Q -- do you see final waste slope there?

17 A Yes.

18 Q And do you see circular arc failure?

19 A Yes.

20 Q Is that generally what we've been discussing?

21 A Yes.

22 Q And what is your factor of safety there?

23 A 2.1.

24 Q And so when you say it would reduce it, are we
25 going to a lower direction --

1 A That would be reduced.

2 Q But you didn't run any calculations to
3 determine that?

4 A No, I did not run -- I selected 60 as the
5 appropriate unit weight for the waste because that is a
6 conservative value. It's at the upper end of what we
7 would ever see. So I did not go to 75, 90, 120, and
8 unreasonable numbers to see how it would affect it.
9 Presumably, I guess I could plug in a number that would
10 bring the factor of safety down, but I didn't do that.

11 Q And as we look at the sliding block failure,
12 could the weight increase the likelihood of a failure of
13 that type?

14 A Yes.

15 Q And so how would an increase in the weight
16 alter that calculated safety factor of --

17 A The geometry of the sliding blocks differ.
18 Depending on the geometry being analyzed, it could --
19 increasing the weight may increase the factor of safety
20 or it may decrease it.

21 Q And what's your calculated factor of safety?

22 A For what?

23 Q For the sliding block failure.

24 A 1.8.

25 Q Versus the recommended that you used based on

1 the Corps of Engineers levees of 1.5?

2 A Yes.

3 Q And you didn't determine how a change in weight
4 would impact that?

5 A How a change in weight would impact that?

6 Q Change in the weight of the --

7 A No. I used what I deemed to be the
8 appropriate -- most appropriate weight of the waste.

9 Q That being 60?

10 A Yes.

11 Q And you didn't do any analysis if that were to
12 vary?

13 A Not this time. But I've used various weights.
14 Typically, a lot of them, before we've run -- and I'll
15 say, I've run a lot of them using 50 pounds per cubic
16 feet. That's a very traditional number. I've started
17 using 60 as a little bit higher number. If you were to
18 look in landfills that are permitted to have waste --
19 that, TCEQ recommends that the assumed weight of the
20 waste be 44 pounds per cubic feet, and it describes
21 using a certain type of compactor to achieve that.

22 Q And --

23 A So 60 is beyond that common number.

24 Q But is 75 a number that's been determined quite
25 frequently?

1 A No, I've never used -- I wouldn't use 75; I
2 didn't.

3 Q But as people have looked at waste around the
4 country, is 75 a number they've come across?

5 A Not that -- I have not seen it.

6 Q Have you reviewed any research by the
7 Environmental Protection Agency into this topic?

8 A On weight of waste?

9 Q Weight of waste.

10 A I have not seen anything recent.

11 Q So you have not familiarized yourself with
12 recent research on the appropriate numbers to use for
13 the weight of waste?

14 A I don't know that there is recent research on
15 that.

16 Q You wouldn't know that because you haven't
17 looked into it?

18 A I have not looked into it recently.

19 Q I'm going to move on to a different topic at
20 this point.

21 Now, are you familiar with -- that there
22 is a reservoir within the property?

23 A Yes.

24 Q Did you do any geotechnical evaluation of that
25 reservoir?

1 A No.

2 Q Did you do any evaluation of the impact of this
3 landfill on that reservoir?

4 A No.

5 Q Do you have any opinion as to the potential for
6 the dam at that reservoir to fail?

7 A No.

8 Q Are you familiar that there is an access road
9 that will be constructed for this facility?

10 A Yes.

11 Q Did you do any geotechnical evaluation of that
12 access road?

13 A Not of the access road.

14 Q Okay. Are you familiar that there is a waste
15 transfer station proposed on this site?

16 A Yeah. It shows up on the drawing.

17 Q Did you do any geotechnical evaluation of the
18 foundation for that --

19 A No.

20 Q -- facility?

21 Turn with me, if you would, to Exhibit
22 EP-1, Page 124.

23 A Page what?

24 Q Page 124.

25 A Okay.

1 Q Do you see where the proposed transfer station
2 is depicted -- well, first let me ask: What is shown on
3 EP-1 Page 124?

4 A That is the general site plan.

5 Q And that's drawing 2A.8 of the application?

6 A Yes, that's correct.

7 Q Do you see where the proposed transfer station
8 is depicted on that drawing?

9 A Yes.

10 Q Does the natural topography vary beneath that
11 site, beneath the footprint of the transfer station?

12 A Does the topography vary?

13 Q Are there contour lines shown on this figure
14 that are the natural topography?

15 A Yes.

16 Q And is there variance in that natural
17 topography beneath the transfer station site?

18 A Yes, it appears so.

19 Q At what elevation will the transfer station
20 be --

21 A I don't know.

22 Q -- constructed?

23 So is it possible that fill will be
24 required in order to make that level site?

25 A That could be the case.

1 Q And did you do any geotechnical evaluation of
2 the stability of that facility?

3 A Of that facility?

4 Q Uh-huh.

5 A No, I have not done a geotechnical
6 investigation specific to that facility.

7 Q And do you see the leachate storage tanks here?

8 A Yes.

9 Q Is [sic] the natural topography also vary
10 beneath those storage tanks?

11 A Yes.

12 Q And did you do any geotechnical evaluation of
13 those?

14 A Not specific to those.

15 Q Okay. And likewise, do you see where the
16 citizen convenience center and the house and scales are
17 depicted?

18 A Correct.

19 Q Did you do any geotechnical evaluation of
20 those?

21 A No.

22 Q Is it your understanding that the Applicant
23 will be authorized to use alternate daily cover at the
24 facility?

25 A I don't know.

1 Q So you don't know whether synthetic liners --
2 whether synthetic covers may be used as alternate daily
3 cover?

4 A No, I don't.

5 Q Let me ask you for the time being to assume
6 that that is permitted, that would be allowed under this
7 permit. Are there any potential problems from a
8 structural integrity viewpoint that can develop with
9 alternate liners, particularly with a synthetic liner --
10 with a -- let me begin again.

11 Are there any potential problems that
12 could develop for the integrity of a synthetic cover
13 used as alternate daily cover?

14 A The integrity of the synthetic cover?

15 Q Yes.

16 A I guess, are you asking do they wear out?

17 Q Is that subject to a greater risk of puncture,
18 say, than using the normally required depth of compacted
19 soil cover?

20 A I wouldn't say so.

21 Q Is that something you've evaluated?

22 A No.

23 Q Earlier we discussed soil for the cover
24 material, for the daily cover in the landfill. Where
25 will you obtain soil for the roads at the facility?

1 A I have not done -- I mean, this shows the
2 location of the road.

3 Q Uh-huh.

4 A I assume that the -- it would be likely that
5 the soil would come from on site.

6 Q Where on site?

7 A Well, that's not designated.

8 Q Okay. And is the same true for, say, screening
9 berms we've discussed? Where would that soil come from?

10 A It's not specified of where it comes from.

11 Q Is there any particular reason why the
12 Applicant has not performed soil balance calculations in
13 this case?

14 A I have not performed them because I have not
15 been requested to.

16 MR. ALLMON: Your Honor, if I can have
17 just a few minutes to review my notes?

18 JUDGE BELL: Sure.

19 MR. ALLMON: Your Honor, if I may go ahead
20 and resume?

21 JUDGE BELL: Sure.

22 Q (BY MR. ALLMON) Okay. Let's turn back to the
23 borings if we could, the 2016 boring program.

24 Are you familiar there was a supplemental
25 geology report submitted?

1 A Can you tell me where we're turning back to?

2 Q Well, for now, are you aware that there was a
3 supplemental geology report submitted?

4 A Yes.

5 Q Did you seal that?

6 A No.

7 Q Who sealed that supplemental document?

8 A I don't know. I -- I -- I know that it was
9 discussed during Mr. Snyder's testimony.

10 Q Is there any particular reason why your seal
11 did not appear on that geology report while you did seal
12 the initial geology report?

13 A Well, in the initial geology report, there was
14 specific sections that -- that are required, about
15 material properties that are in there. On this one,
16 there was not a change to the sections that I had -- or
17 supplement to those sections.

18 Q Now, in that report, the supplemental report
19 summarized information regarding the 2016 boring
20 program. Is that accurate?

21 A I have not reviewed the report.

22 Q Okay. Now, for the 2016 drilling, how -- were
23 you present for part of that drilling?

24 A Yes, I was.

25 Q How frequently were you present?

1 A I would be there several days and then gone for
2 several days. I don't recall the total number of days.
3 But I think I recall at least three separate trips.

4 Q How did the frequency of your visits compare to
5 the frequency of Mr. Snyder's visits?

6 A I was there at least one day with him. I know
7 there were some days that -- sometimes when I couldn't
8 be there, he was there. That's about the most I can
9 tell you about --

10 Q Were there many days when you were there and he
11 was not?

12 A Yeah, there were days that I was there and he
13 was not and vice versa.

14 Q Now, was Mr. Snyder present for only two or
15 three days during the entirety of the 2016 drilling
16 program?

17 A I don't know.

18 Q So that is possible? You don't remember him
19 necessarily being present for more than two or three
20 days?

21 A He was present for two or three days that I was
22 there. Well, I know we were there together one day.

23 Q Okay.

24 A That's what I remember.

25 Q But you don't know that he was present for any

1 more than two or three days?

2 A I don't know when he was present, other than I
3 recall having conversations with him while he was there
4 and I was back at the office.

5 Q Now, during the 2016 boring program in your
6 time on the site, did you take any field notes?

7 A I recorded field notes in Stefan Stamoulis'
8 journal one or two days.

9 Q So you -- is that -- you made markings in
10 Mr. Stamoulis' journal?

11 A Yes.

12 Q Now, did you preserve those?

13 A No. I returned his journal to him.

14 Q Do you know what happened to that journal?

15 A No.

16 Q At any point during the 2016 boring program --
17 well, the process of drilling the borings, does that
18 involve the introduction of fluid?

19 A It can.

20 Q It can?

21 And is that fluid circulated in and out of
22 the boring?

23 A Let me go back a little bit, because I mixed up
24 two events when I was talking about when I was there and
25 when I was not. As I was telling you the amount of time

1 that I spent down there during the boring program, I was
2 actually speaking about when the opposition was
3 drilling. It was during their drilling program that we
4 were alternating spending time there. And it was during
5 that time that I made notations in Mr. Stamoulis'
6 journal, not during the BME portion.

7 Q So -- just to make the record clear, so at the
8 time when Protestants out there [sic], on some
9 occasions, you made markings in Mr. Stamoulis' journal?

10 A While they were drilling, yes.

11 Q And at any other time outside of that, did you
12 make markings in Mr. Stamoulis' journal?

13 A No.

14 Q Did you otherwise take any field notes?

15 A No.

16 Q And we had moved on to a certain other line of
17 questioning. So the process of drilling, does that
18 involve the introduction of -- as was performed in some
19 cases here, did it involve the introduction of fluid
20 into the borehole?

21 A Yes, sometimes they introduced fluid.

22 Q And did it generally involve the circulation of
23 fluid then back out of that borehole?

24 A Yes.

25 Q Was there any point during the boring program

1 where the Applicant lost circulation?

2 A That's my understanding.

3 Q And what does the loss of circulation indicate?

4 A It could indicate a number of things. It
5 indicates that the fluid left the borehole.

6 Q And if the fluid within the borehole leaves the
7 borehole, how might that happen?

8 A It has to find some pathway or move into the
9 formation.

10 Q So could that indicate a pathway for water to
11 move within the formation?

12 A Not always.

13 Q Hmm?

14 A No, not always.

15 Q But can that be one cause for a loss of
16 circulation?

17 A It could be one cause.

18 Q Okay. Was that considered in the Applicant's
19 characterization of the site, that loss of circulation?

20 A In which characterization?

21 Q In the supplemental geology report.

22 A I have not read the supplemental geology
23 report.

24 Q But there was no point in your work on it where
25 you were involved in considering that loss of

1 circulation in characterizing the site?

2 A No, that didn't affect my work.

3 Q Are you familiar with what percentage of
4 recovery you were getting from your samples during the
5 2016 boring program?

6 A Not the exact percent. But I know that the
7 recovery was good.

8 Q Were you getting full recovery?

9 A Not full recovery.

10 Q Okay. Were all of your -- did you obtain some
11 samples that were undisturbed?

12 A Yes.

13 Q Did you -- were some of your samples you
14 obtained disturbed?

15 A Some of them -- I would say that, yeah, some of
16 them were disturbed. But we used undisturbed sampling
17 methods.

18 Q Are undisturbed samples required to run
19 permeability tests?

20 A Yes.

21 Q Now, but can you run other lab analyses, such
22 as classification tests or Atterberg limits, with a
23 disturbed sample?

24 A Yes.

25 Q And is that true also for a sieve analysis, can

1 be run on a disturbed sample?

2 A Yes.

3 MR. ALLMON: Your Honor, that's all of my
4 questions. I pass the witness.

5 JUDGE BELL: All right. Thank you.

6 Remind me, did we go -- did --

7 MR. MAGEE: I haven't gone yet.

8 JUDGE BELL: You haven't gone yet. Okay
9 I'm assuming you have more than it would take to get to
10 lunch, assuming we go to lunch within the next 15 to 20
11 minutes?

12 MR. MAGEE: If I went to lunch, I may be
13 able to narrow it down.

14 JUDGE BELL: All right. Let's do that.

15 MR. RYAN: Well done.

16 JUDGE BELL: All right. So we'll take our
17 lunch break now and be back at 1:00. Thank you.

18 (Lunch Recess: 11:57 a.m. to 1:09 p.m.)

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1 AFTERNOON SESSION

2 THURSDAY, AUGUST 18, 2016

3 (1:09 p.m.)

4 JUDGE QUALTROUGH: All right. We are back
5 on the record, August 18th. We -- as we left off, I
6 think we were going to Caldwell County for
7 cross-examination.

8 PRESENTATION ON BEHALF OF APPLICANT (CONTINUED)

9 GREGORY W. ADAMS, P.E.,

10 having been previously duly sworn, testified as follows:

11 CROSS-EXAMINATION

12 BY MR. MAGEE:

13 Q Good afternoon, Mr. Adams. I'm Eric Magee, and
14 I represent Caldwell County.

15 A Good afternoon.

16 Q So part of your aspect in the preparation of
17 the application for this landfill was that you prepared
18 or supervised all aspects of the geotechnical designs
19 for the landfill which included the liner designs.

20 Correct?

21 A Correct.

22 Q I believe earlier Mr. Allmon asked you some
23 questions about the liner, and he was asking you where
24 the materials were coming from for the liner. And you
25 were saying probably on-site. Correct?

1 A Correct.

2 Q What -- how would you describe the material
3 that you're going to be using for the liner?

4 A Well, the material -- there's specifications
5 that the material has to meet.

6 Q Okay.

7 A And those specifications, they're outlined in
8 the Liner Quality Control Plan. And would you like me
9 to turn there and show them to you?

10 Q By that you're referring to -- are you
11 referring to Page 130EP-3, Page 67?

12 A No.

13 Q Okay. Tell me what page you were referring to.

14 A 130EP-3, Page 432.

15 Q 432? Okay. So this is the compacted soil
16 liner that you and Mr. Allmon were talking about?

17 A Yes.

18 Q Okay. And Table D7-2 in the middle of the
19 page?

20 A Yes. That's the requirements for the compacted
21 soil liner, the material that can be used.

22 Q Okay. And where are you obtaining this
23 material from?

24 A I don't specify where the material comes from.
25 I do note in the geotechnical portion of the report that

1 the on-site materials do meet these criteria.

2 Q So like if we look at 4.1 on Page 432, the
3 first sentence says, The compacted soil liner component
4 of the composite liner system consists of a 24-inch
5 thick layer of compacted relatively homogeneous cohesive
6 material.

7 What does it mean "homogeneous"?

8 A That means that the materials throughout the
9 two foot, we -- we -- the compaction process has to mix
10 those, and so -- I say homogeneous means alike.

11 Q Okay. I think I missed a word there in there.
12 What did you say -- what process?

13 A The compaction process. If you go -- there are
14 specifications for processing and placement and
15 compaction in that same document, Sections 4.4 and 4.5.
16 And in that process we have to create a relatively
17 homogeneous material. That means that throughout the
18 profile of that material, it all has to meet the -- meet
19 this criteria.

20 Q And what does it mean "cohesive material"?

21 A Cohesive material is material that exhibits
22 cohesion. We common -- a common word would be it's
23 sticky.

24 Q Okay. So when you go through this process and
25 you're looking at placement and processing, what does

1 the word -- what are you looking for for placement?

2 A Well, from Page 433, what we're looking for for
3 placement is that it's going to be placed in a maximum
4 of eight-inch-thick loose lifts. That is, you lay the
5 soil down and lifts parallel to the subgrade, the base
6 you're laying it on. In its loose condition, when we
7 lay it down, we don't want it to be any thicker than
8 about eight inches. That's placement.

9 Q I'm just trying to make sure I get kind of a
10 visual here of there's some material somewhere on-site,
11 and you're moving it over to where the landfill is going
12 to be. Right?

13 A Correct.

14 Q And you're going to put that down?

15 A Yes.

16 Q Am I with -- I have to be simple on this stuff.
17 And so of that material, the way it's described on Page
18 432 is that it has to be homogeneous and cohesive
19 material?

20 A Yes.

21 Q I'm correct so far. Right?

22 A Yes.

23 Q So when the testimony was coming in earlier
24 from Mr. Allmon, when he was asking you about pebbles
25 and rocks and all that other things that are possible,

1 gravel out at the site --

2 A Uh-huh.

3 Q -- okay? Does that mean that the pebbles and
4 gravel and all that stuff being in those materials, does
5 that make it homogeneous?

6 A It would make it neither. There's a criteria
7 that anything above a one-inch-particle diameter would
8 not be allowed. So in the mass of the soil, if it is
9 the clay material with random one-inch or less
10 particles, that's homogeneous.

11 Q Okay. So then if you had materials like you
12 just described and it was greater than one inch, then
13 would that be considered what? Heterogeneous?

14 A That would be not part of the liner material.

15 Q I don't think that was my question. My
16 question was: If you -- if it's possible that you had
17 materials in there -- pebbles, gravel, whatever -- that
18 was bigger than one inch, would that make that material
19 heterogeneous?

20 A If I had particles bigger than one inch in the
21 liner?

22 Q Right. Not in the liner, just materials out
23 there -- you're looking for material to create a liner.
24 Correct?

25 A Yes.

1 Q Okay. And my understanding from your testimony
2 just now is that what you consider homogeneous is
3 materials that are sticky or cohesive materials and if
4 it's less than one inch?

5 A If it meets the criteria for a liner.

6 Q Okay. Do -- and part of that criteria for the
7 liner is materials that are less than one inch. Right?

8 A Yes.

9 Q Okay. How do you -- and so materials that
10 would be above one inch you would not consider to be
11 homogeneous?

12 A They're homogeneous with materials above one
13 inch. I mean, if I had a pile of exactly one-inch
14 rocks --

15 Q Right.

16 A -- they would -- that pile would be
17 homogeneous.

18 Q Okay. Under -- if it's all rocks --

19 A If it's all that, yes.

20 Q -- they would all be homogeneous?

21 A Yes.

22 Q But if they were mixed together with clay, the
23 type of material that you were looking at to make a
24 liner, then you wouldn't consider that material
25 homogeneous?

1 A If I had rocks less than one inch mixed with
2 the soil, yes, I would still say it's relatively
3 homogeneous.

4 Q And is there any rules that look at the -- like
5 a balance or a percentage of I'm looking for it to just
6 be five rocks out there in it or a hundred rocks out
7 there in it? I mean, what do you -- what do you look at
8 to evaluate the difference between if it's homogeneous
9 or not homogeneous to create this liner?

10 A About percentage of rocks?

11 Q Yeah.

12 A If you look at placement and processing on Page
13 433 --

14 Q Okay.

15 A -- in the first paragraph, last sentence, Rocks
16 and clods less than one inch in diameter should not
17 total more than 10 percent by weight.

18 Q Okay. What about rocks and clods that are
19 greater than one inch in diameter?

20 A They're not allowed in -- we can't use material
21 that has those greater diameter rocks.

22 Q Then how do you go through the material to
23 determine if there's rocks in it that are greater than
24 one inch?

25 A We have a full-time observation of this

1 process.

2 Q Okay. So what does that consist of?

3 A Consists of a soils technician who is there
4 watching the process. There's several things we have to
5 do in this Liner Quality Control Plan for each liner
6 construction event. It lists all the things that will
7 take place.

8 The first way we do that is that the --
9 before material can be approved for liner construction,
10 we have preconstruction testing on it that has to be
11 done to preapprove it. And so we'll do that in advance.
12 We'll go to whatever the source of it is. So we'll use
13 this material. We take samples of that material, and we
14 run tests on that material to see if it's going to meet
15 these criteria. That preapproves it.

16 Once we start placing the lifts of the
17 liner, then there is a full-time soils technician who
18 has to observe all the placement, and then he has to run
19 tests on that material as it's placed.

20 Q So he -- there's going to be somebody out there
21 running tests all the time to ensure that there's
22 nothing one inch or greater in any of this material?

23 A Yes. Well, if he doesn't run a test; he's
24 going to be observing the material.

25 Q And how does he -- I mean, how is he gathering

1 that up? I mean, with like a bulldozer? A backhoe? I
2 mean --

3 A No. He's -- we place it in eight-inch lifts.
4 It's spread out. So as it's dumped or spread, he's able
5 to watch the material.

6 Q Okay. So is it possible for materials that are
7 greater than one inch to make it into that type of
8 material?

9 A Greater than one inch? I guess it's possible,
10 but it would be highly unlikely to go unnoticed.

11 Q But it is possible. Correct?

12 A For a piece greater than one inch?

13 Q Yes.

14 A I guess it would be possible.

15 Q Okay.

16 A But it would be -- my experience is it will be
17 noticed.

18 Q So just looking at Page 433, that sentence, on
19 this landfill site you do anticipate that there will be
20 rocks and clods that will be in the liner material?

21 A No. There will be no reason -- if it came from
22 on-site material, there will be no reason to use that
23 upper zone that has the rocks and clods in it.

24 Q But you've testified today you don't even know
25 where you're getting the materials from. Right?

1 A I know. But you said that it would be
2 reasonable to think that it would include that Zone 1
3 that has the rocks and clods. There is so much material
4 on this site that does not have rocks and clods in it,
5 there will be no reason to -- for the contractor to
6 work -- in the material he would have to put extra work
7 into excluding the rocks and clods.

8 Q So if you'll turn to Page 67 of EP-3.

9 A Okay.

10 Q Can you tell me what this table is at the
11 bottom of that page?

12 A Oh, that's the summary of the requirements for
13 compacted soil liner materials.

14 Q So when you did these borings in 2013, would
15 all of the samples' lab results from that boring program
16 meet the requirements for a soil liner as in this table?

17 A As on this table?

18 Q Yes.

19 A I believe all the materials with the exception
20 of that portion in the surface that has rocks --
21 particles bigger than one inch.

22 Q Okay. And would that same statement be true --
23 well, let me just ask it this way. For the result --
24 for the sampling that was done for the borings in 2016,
25 would all the sample lab results also meet the

1 requirements from this table?

2 A I'll have to look in another volume --

3 Q Okay.

4 A -- to see that.

5 Q Okay. Is that Volume -- it's EP-7. Right?

6 A Yes.

7 Q And that's Volume 5, EP-7.

8 A And I can find that on EP-5, Volume 7. It's
9 noted Applicant's Exhibit Adams 5, Page 2.

10 Q Okay. You're talking about your prefiled
11 testimony?

12 A Yes.

13 Q Okay.

14 A I think that's --

15 Q Okay.

16 A Okay. That chart is a plot of the Atterberg
17 limits for all the samples that have been run for the
18 various investigations.

19 Q Okay.

20 A And if you'll notice that basically the plot is
21 liquid limit versus plasticity index. Anything that
22 would fall within the shaded green area would meet the
23 plasticity requirement for compacted soil liner. So if
24 you see that the blue dot represents samples from 2013,
25 and all of the blue dots fall within that green shaded

1 area. The red squares represent the samples from 2016,
2 and all but one fall within that shaded area.

3 Q Okay. So when we're comparing Adams 5, Page 2,
4 we see on one side it's -- or the bottom it says Liquid
5 Limit. Right?

6 A Yes.

7 Q And on the other side it says what?

8 A The other axis, vertical axis, would be
9 Plasticity Index.

10 Q Okay. So then when we look back at EP-3, Page
11 67, there's two columns under Test that say
12 Plasticity -- I can't even say it -- Index and Liquid
13 Limit. Right?

14 A Yes.

15 Q Okay. But right above that, it says, Hydraulic
16 Conductivity. Correct?

17 A Correct.

18 Q Okay. And that's not on this chart. Right?

19 A No. This chart can't represent hydraulic
20 conductivity.

21 Q Okay. So how deep will this landfill be, the
22 excavation of the landfill?

23 A By recollection, I think it's somewhere in the
24 40- to 50-foot maximum depth with other areas more
25 shallow.

1 Q How shallow?

2 A I don't recall exactly. Probably around
3 25 feet.

4 Q And then that's where we would look back, I
5 guess, at the boring samples to see what type of
6 material are at those various points. Is that fair?

7 A For what purpose?

8 Q To see what type of materials you would be
9 gathering that you could potentially use to -- use as a
10 compacted soil liner.

11 A Yes. You could look at -- within -- I mean, if
12 you're looking -- if we can use all the materials from
13 the excavation for the landfill itself --

14 Q Right.

15 A -- you could -- you could look at what falls
16 within that surface of those depths.

17 Q And when you're excavating these landfill
18 sites, you want to go deep enough that you can satisfy
19 all of your soil needs for this liner and other needs
20 within the landfill. Correct?

21 A That depends upon the owner.

22 Q What about for, like, access roads?

23 A For access roads?

24 Q Right.

25 A I say, again, that depends -- each site is

1 different. Depends upon the owner.

2 Q Because then you would actually have to be
3 bringing materials in. Right?

4 A I know you can't see me.

5 Q I know. We keep moving. I'm sorry.

6 That means you'd have to actually be
7 moving materials in from offsite if you didn't excavate
8 enough to fulfill your needs. Right?

9 A If you didn't excavate enough to fulfill your
10 needs out of the cell itself?

11 Q Right.

12 A Well, that -- I mean, you could. There's
13 nothing to prohibit moving in from offsite, but there's
14 nothing prohibit you most times from using other areas
15 of the site.

16 Q I want to move on to a different topic, and
17 that's in EP-3, Page 221. I think this is 3.2 --
18 Section 3.2 on Page 221. That's an area that you and
19 Mr. Allmon covered earlier.

20 A Yes.

21 Q Do you recall that?

22 A Yes. Uh-huh.

23 Q Okay. And I think specifically you talked
24 about the first sentence where it said, Temporary
25 containment berms will be constructed around the active

1 face to collect and contain surface water that has come
2 into contact with waste.

3 And then the next portion of that says, In
4 addition to planned containment berms around the active
5 face, temporary containment berms will be constructed
6 wherever needed to collect contaminated surface water.
7 Right?

8 A Right.

9 Q And then Mr. Allmon asked you a line of
10 questioning about the 25, 24-hour storm event. Do you
11 recall that?

12 A Yes.

13 Q And then if a storm event happened within the
14 hundred-year storm event, that event could overtake some
15 of these berms, potentially. Right?

16 A Depending on where the berms are constructed
17 and the geometry. They're not designed for the
18 hundred-year.

19 Q Right. And then you would agree with me that
20 then some of these berms mentioned in the first
21 sentence, these temporary containment berms and these
22 unknown planned ones, they could also wind up in the
23 floodplain. Correct?

24 A No. These -- these berms discussed here?

25 Q Right.

1 A The ones that are on the active face, they're
2 within the landfill footprint.

3 Q So how are you going to contain contaminated
4 surface water outside of the landfill footprint?

5 A I don't know what the source of -- these --
6 these berms are designed -- or at least the ones in the
7 first place are for the active footprint. You're saying
8 contaminated water outside the active footprint?

9 Q Right.

10 A And how will we contain that?

11 Q Right.

12 A Well, we can use berms.

13 Q And then those could potentially wind up in the
14 floodplain. Correct?

15 A If you needed to contain water within the
16 floodplain with a temporary berm, it could be there.

17 Q Okay. In Volume 4, I think it was on Page 123.

18 JUDGE QUALTROUGH: And that's Exhibit 4?

19 MR. MAGEE: Yes, Exhibit -- 130EP-4, Page
20 123.

21 Q (BY MR. MAGEE) You with me?

22 A Yes.

23 Q I think this is a boring -- a log of a boring
24 that you and Mr. Allmon talked about where there was
25 some lengthy discussion about the description of CH and

1 the description of CL. Correct?

2 A Yes.

3 Q I believe I heard you earlier say you're not an
4 expert in hydrogeology. Correct?

5 A In hydrogeology. That's not my field.

6 Q Okay. So you wouldn't know whether a different
7 material from CH within a particular interval is
8 important hydrogeologically, would you?

9 A If it's important?

10 Q Right, because you don't know about the --
11 you're not an expert in hydrogeology. Right?

12 A No. My role is to create a log that represents
13 the soil profile.

14 Q Okay.

15 A And that's what I did.

16 Q So you're not providing any testimony about the
17 hydrology of CH versus CL. Right?

18 A No, I've not done that.

19 Q Okay. So if you flip back a couple of pages,
20 on Page 119, 130EP-4, this is an example of a boring log
21 where you took -- it looks like -- I want to make sure
22 I'm making the right assumption here -- three different
23 samples. Right?

24 A Yes.

25 Q And then that continues on to the next page on

1 120. Correct?

2 A Yes.

3 Q And then if you go to the next boring log of
4 BME 30, you only took one sample there. Right?

5 A Right.

6 Q And then on Page 22, that's just a continuation
7 of Boring 30. Right?

8 A Correct.

9 Q Then we have the one on Page 123 where it's
10 just one sample in there?

11 A Correct.

12 Q And that continues on to Page 124. Correct?

13 A Correct.

14 Q Then we look at the log boring for No. 32, and
15 it looks like you took four samples there?

16 A Correct.

17 Q And then if we look through here, there may be
18 some of these same boring logs that you took no samples
19 out of. Is that fair to say?

20 A Yes.

21 Q So what procedures do you use when you're
22 choosing on how you're going to distribute your samples
23 throughout the site, at all these various borings?

24 A It depends on the site and the types of
25 materials. Now, I have a requirement by the rules that

1 I have to run tests on a minimum of one sample from each
2 layer that will be present in the side wall or bottom of
3 the excavation.

4 Q Okay.

5 A And so I have that requirement. I have to have
6 one. So one thing is I be sure that for each of those
7 layers, I have at least one sample. This -- I have, of
8 course, many, many more than one. So we will go from
9 there, I want to look out across the site. I don't want
10 to have all the samples gathered in one boring on one
11 end of the site and not equally test others. So I try
12 to get a spacial distribution of those.

13 And as I'm looking through the samples, I
14 notice that from boring to boring, the samples can be
15 very similar. And, now, if I get into another part of
16 the site and I start noticing changes, then I may need
17 more testing there. So it's a -- it is -- I use the
18 testing to aid the visual logging.

19 Q So is that written procedure that you have
20 somewhere, or is that just something you decide to do?

21 A That's the way I have -- that's the way I have
22 been trained, and that's the way I do it.

23 Q So why would some bore holes have many lab
24 samples like we've seen where we've seen like three or
25 four, and then others just have none at all?

1 A Well, because I may go through one boring, and
2 you see the one on 125. I've tested about 10 feet, 20,
3 30, 45, about every five feet through that, going down
4 through the column. I'm probably logging a boring
5 adjacent to it or the next closest boring, if the
6 material all looks similar to that, many times I may not
7 take many tests there. I may get over further from that
8 one and then take a lot more tests. I'm just trying to
9 not to have big gaps in the data, not only vertically
10 but also horizontally.

11 Q Okay. I guess I wasn't going to ask that
12 question, but now I am. What do you mean "horizontally"
13 and "vertically" when you're running these samples?

14 A Well, you have to think of it in three
15 dimensions. You're looking at a boring log which is a
16 two-dimensional log. It basically goes from -- it's
17 vertical. It's from the ground surface down. But the
18 soil mass extends laterally.

19 Q Right.

20 A And so when I say "horizontally," I'm saying
21 that I may have a lot of samples here. Somewhere over
22 here on the site, I may have a lot of samples. In
23 borings between them, I may have fewer.

24 Q You -- can you help me find where there's one
25 of those maps that shows all the locations of the

1 various borings? Do you know what volume that would be
2 in?

3 A Probably be in the first part of the -- right
4 in front of the boring logs.

5 Q Okay. Page 47. I'm trying to find my page.
6 Hold on just a second. So like, for example, if you're
7 looking at Boring Log No. 3 on the map on Page 47 --
8 right?

9 A Okay.

10 Q -- I'm just trying to understand your last
11 statement about it being vertical and horizontal and
12 that kind of stuff. The samples that you took, like at
13 Boring Log No. 3, could look very different than the
14 samples that you took at Boring Log No. 18. Right?

15 A They could or they do?

16 Q I'm just asking if they could.

17 A Oh. Yeah. I mean, yeah, in distance they
18 could look different.

19 Q Because that's a pretty far distance from one
20 to the other.

21 A Yes.

22 Q So like if we look at Boring Log No. 3 on Page
23 57 --

24 A Okay.

25 Q -- it looks like a sample was taken at a depth

1 of, what, like 27 feet?

2 A Yes.

3 Q And then if we look at the boring -- and that's
4 the results over there in the far right-hand columns.
5 Right?

6 A Yes.

7 Q Okay. And then we go over and we look at
8 Boring Log No. 18, which I think is on Page 95.

9 A Okay.

10 Q You with me?

11 A Yes.

12 Q So there's no samples taken at that same range
13 of 27 feet. Right?

14 A Correct.

15 Q Okay.

16 A But if you were to turn to the next one, to 19,
17 you would see numerous samples.

18 Q But if you compared -- I mean, 18 and 19, how
19 far apart are those two borings?

20 A Well, I don't know. Roughly 500 feet.

21 Q Okay. And the lines that are shown on here are
22 different elevations. Right? Like where it says --

23 A The contour lines, yeah, those represent
24 elevations.

25 Q Okay. So the two boring sites at 19 and 18 are

1 a little different -- right -- as far as elevation goes?

2 A Yes.

3 Q Okay. So when you chose to do the sampling,
4 did you base that on geology?

5 A The sampling?

6 Q Right.

7 A No. I chose to do the sampling to help aid in
8 the visual identification. So I wanted enough samples
9 from similar -- I looked at material, and I -- I may
10 look at the samples from 3 and look at the samples from
11 18 and look at the samples from 19. I have tests
12 already in 3 and 19. I'm looking at 18, and I look and
13 say, "This is virtually the same material I had in 19."
14 So I don't need to run additional tests to help -- to
15 help classify it and describe it.

16 Q Okay. Well, then, help -- I guess I need to
17 understand if I'm looking at 19, which is on Page 98 --
18 right -- did the geology look significantly different
19 vertically in the boring where you took those multiple
20 samples?

21 A Oh, was it through that -- was it looking --

22 Q Right.

23 A No.

24 Q So, I mean, like if we look at your material
25 description here, and you have like CH, CH, CH at the

1 various descriptions there, why was there a need to take
2 multiple samples in just this one boring instead of
3 taking a sample, let's say, over at 18?

4 A Well, in here, in some cases I like to go
5 through the whole profile to show that it was consistent
6 from top to bottom. And so in some borings, I would do
7 this. I would take samples up and down the column to
8 show -- you know, to see if I have a sample at 20 feet,
9 is that representing what I'm seeing at 40 feet? So I
10 do that in some cases.

11 In other cases I want to see laterally or
12 horizontally. If it's the same material I'm seeing over
13 there, I may take a test and look.

14 Q And so like for 17 and 18 where you've taken no
15 samples, you're just making an assumption that it's
16 similar to some other boring that you've taken. Right?

17 A Well, I'm not assuming; I'm looking at the
18 samples. I'm actually looking at the samples and
19 logging them. As I tell you, I use the lab tests to
20 help me and assist in selecting the classification.

21 Q And so then we don't have any lab tests, for
22 example, on Page 93 for No. 17 or any lab test for
23 No. 18 which starts on Page 95. Correct?

24 A 93, no lab test.

25 Q And 95 -- 93 is for BME 17.

1 A And on Page 95 I see no lab test.

2 Q Okay. So when you do these tests of the soils
3 and geology out there at the site, I think I -- we were
4 on liners earlier. If you'll look at EP-30, Page 434,
5 it's in --

6 A Excuse me.

7 Q It's in Volume --

8 A EP what?

9 Q 3.

10 A 3.

11 Q Which is in Volume 3.

12 JUDGE QUALTROUGH: What was the page?

13 MR. MAGEE: 434.

14 A Okay, I'm there.

15 Q (BY MR. MAGEE) Okay. So if we're looking at
16 that table in the middle of the page --

17 A Yes.

18 Q -- right -- that's your compacted soil liner
19 materials preconstruction test. Right?

20 A Yes.

21 Q And so on the far right-hand corner, it says
22 Frequency, and it says, One per material type.

23 A Yes.

24 Q What does that mean?

25 A That means for each type of material -- and

1 they have to -- you have to have one test to represent
2 it. If you look at --

3 Q So, for example, if we're looking at the boring
4 logs that we were looking at earlier where you had the
5 description as CH, that's the material type. Right?

6 A Yes.

7 Q And so you would do one of these samples
8 where -- on the left-hand side under Test, you would do
9 a sample, one per material type. Right? So all of this
10 would be conducted for CH. Right?

11 A Well, all of this would be conducted for each
12 material that you propose to use for a liner.

13 Q And so will the number of tests for liner
14 materials depend upon the number of types of material
15 from the site?

16 A Yes. And you also have to -- you have to go to
17 Page 435 --

18 Q Okay.

19 A -- in the construction event, how that's
20 determined, if you -- the determination of material
21 types are changed is if you look at below Table D7-4.

22 Q Okay.

23 A The paragraph says, Atterberg limits of the
24 in-place compacted soil liner --

25 THE REPORTER: Wait, wait, wait.

1 THE WITNESS: Yes, ma'am, I will. That's
2 the second time today. I'm sorry.

3 Q (BY MR. MAGEE) I've never been asked to slow
4 down, either, so I can understand.

5 A I know. I guess I want to go home.

6 The Atterberg limits of the in-place
7 compacted soil liner must be compared to the Atterberg
8 limits of the Proctor curve sample to assure that the
9 Proctor curve represents the in-place material. Any
10 variance of more than ten points between the liquid
11 limit or the plasticity index of the in-place soil and
12 those of the Proctor curve sample will require a new
13 Proctor curve sample be developed.

14 What is -- that is meaning is that we --
15 the preconstruction tests, well, the results of that is
16 a Proctor curve. It's a standard that we compare to
17 during the construction of the liner to see if we're --
18 for the testing, for the density testing, along with
19 that --

20 Q Okay. So let me back you up right there on the
21 density testing. So the density testing, is that
22 referring to the CH and the CL, that designation, or
23 not? That's just a material type?

24 A It does not.

25 Q Because you said a lot of words in there that I

1 may have to look up later on. But I guess what my main
2 question was it was based on some of Mr. Allmon's
3 questioning, when he was talking specifically about that
4 one boring where a number fell below. Do you recall
5 that one? And he -- you described it as CL versus CH.

6 A Yes.

7 Q Okay. So if you were using that type of
8 material, CL, if we look back at 434, then you would
9 also have to conduct tests for that type of material.
10 Right?

11 A Yes, but the testing criteria of when you
12 select how many materials, it's not based on the boring
13 logs; it's based on the actual materials used during
14 construction and the tests that are performed during
15 construction.

16 Q And I was just trying to make sure I understood
17 kind of what this chart meant. I think I'm
18 understanding it that if you're using CH material, you
19 have to do one -- the frequency is one per material
20 type. And then CL, you would also have to do one per
21 material type?

22 A At a minimum.

23 Q Okay. I'm just trying to make sure I'm
24 understanding.

25 A And the reason the minimum is because of the

1 ten -- if the Atterberg limits vary by more than ten
2 points, one CL could be a material. And if it varied by
3 more than ten points, I would need to run another round
4 of preconstruction test.

5 Q For a different, what, CL?

6 A Yeah, or for a different CH.

7 Q So if one CH is a certain limit, then you'd
8 have to run another test for another CH and so forth.
9 Right?

10 A Yes.

11 Q Okay. I think that's about as technical as I
12 can get, because I'm just trying to make sure I'm
13 understanding all the documents and tests that need to
14 be run in trying to look at the boring sample.

15 A Well, the effort is CH and CL, it's a
16 relatively broad band.

17 Q And they're different materials. Right?

18 A And so within that classification of CH, the
19 attempt is to have the reference test that we're
20 comparing to be a true reference of the material that's
21 being used.

22 Q And since it's a broad band, there's -- it's my
23 understanding by this limits, there's different tests
24 you would need to run within each broad band if it
25 exceeded those limits?

1 A Well, not -- you'd need to run the same test
2 again.

3 Q Right, for the new material?

4 A Yes.

5 Q That's --

6 A And that's part of the construction process.

7 Q Okay.

8 MR. MAGEE: See, I narrowed all my
9 questions down to these concise ones, and I think I'm
10 done.

11 (Laughter)

12 JUDGE QUALTROUGH: All right.

13 MR. MAGEE: I promised you if we went to
14 lunch, I can not go over the same exact stuff every
15 time.

16 JUDGE QUALTROUGH: All right. So that
17 brings us back to redirect.

18 MR. RYAN: Thank you, Your Honor.

19 REDIRECT EXAMINATION

20 BY MR. RYAN:

21 Q Mr. Adams, while we're in Volume 3 here, would
22 you turn to Page 221 of 130EP-3? In that middle
23 paragraph there, there's a reference to use of a
24 25-year, 24-hour storm event for these containment
25 berms. How did you decide to use that storm event?

1 A That's the event that's required by the
2 regulations.

3 Q And as far as limiting the potential for
4 contamination of water, would daily and intermediate
5 cover in the general -- in this general area of the
6 landfill also provide some protection?

7 A Yes. That would prevent water from coming in
8 contact with waste so you wouldn't generate contaminated
9 water.

10 Q Over the course of your career, do you have
11 experience with collecting, preserving, transporting,
12 and storing soil samples?

13 A Yes.

14 Q You have extensive experience doing those
15 things?

16 A Yes. I've been -- I have been doing that since
17 I -- since 1985.

18 Q And have you developed standard practices that
19 you follow in connection with those procedures?

20 A Yes. The typical way that I've done it at
21 other firms, and the way that I do it now that I'm with
22 Biggs & Mathews, is that our effort is to preserve the
23 sample as intact as possible. Therefore, once it
24 comes -- once we extrude the samples, which means we
25 take them out of the sampling in the field when they're

1 drilled, and as quick as possible our direction to the
2 drillers, when we have them, is to wrap them in plastic
3 and to tape them and seal them up, so they don't lose
4 moisture, and to label them with a labeling system and
5 then are placed in sample boxes or special boxes that
6 are made for samples or basically big flat boxes about
7 two by three. They have baffles in them so you can
8 align the samples up in them, and then label the boxes,
9 then we bring the boxes back and store those for
10 examination.

11 Q And are those the practices that were followed
12 in connection with all of the borings done by and for
13 Biggs & Mathews in this case?

14 A Yes, it was.

15 Q And in your opinion, are those procedures
16 appropriate and sufficient?

17 A Yes.

18 Q If you'd -- while we're still here in Exhibit
19 130EP-3, if you'd turn to Page 78. Could you explain
20 what a factor of safety is?

21 A Oh, yes, I could. Because we have the
22 recommended factor of safety would be what we would --
23 what we're looking to stay above. The factor of safety
24 is simply if we were to calculate the force that's
25 attempting to make the slope fail, the sum of all the

1 forces that are driving it downhill, whatever the
2 mechanism, and we were -- or -- then we calculated all
3 of the resistance that's available, we would like the
4 resistance actually to be more than the force trying to
5 make it slide. So the factor of safety is simply the
6 resistance divided by the driving force.

7 So in the case of 1.5, that means that the
8 resistance is one and a half times greater than any
9 force that would be trying to fail the slope or drive
10 the slope downhill.

11 We talked about failure surfaces. We're
12 looking at is, that's really not correct when we look at
13 the drawing. We talk about all those failure surfaces.
14 They're not failure surfaces; those are surfaces that we
15 calculated the resistance, both the resistance and the
16 driving force. So failure would occur -- would occur
17 just below 1. Factor of safety is .999, then the slope
18 would fail because you have -- it's not at equilibrium
19 anymore. So failure doesn't occur at 1.5; 1.5 is where
20 we want to be that much above failure.

21 Q And you identified the Corps of Engineers'
22 reference that you used for the recommended factors of
23 safety on Page 78. Is that right?

24 A Yes, that's right.

25 Q In your opinion, was that an appropriate

1 reference to use here?

2 A Yes. It's the reference that I have used since
3 1993, and I'm not -- I think it is appropriate, and I've
4 heard no objections to it.

5 Q In relation to the scale house and scales, the
6 transfer station building, the Citizens Convenience
7 Center, the leachate storage tank area, and other
8 individual structures proposed to be built within the
9 permit boundary, when would be the appropriate time to
10 conduct geotechnical evaluations associated with those
11 structures?

12 A Would be closer to the construction phase when
13 you're ready to design the structure. At that point you
14 would know the actual final size of the structure and
15 the construction materials, and then it would be
16 appropriate to conduct a study.

17 Q Have you ever done that level of geotechnical
18 evaluation for those types of structures at the
19 permitting stage?

20 A No.

21 Q And would that also hold true for a site access
22 road?

23 A Yeah, that would be true for the access road.

24 Q If soil borrow areas were established on-site
25 at this facility within the floodplain area, is there

1 any reason that those borrow areas would be inconsistent
2 with the use of floodplain areas for the storage of
3 flood waters?

4 A Well, they certainly wouldn't take away storage
5 volume because you'd be excavating and creating more
6 volume.

7 Q Do TCEQ's municipal solid waste permitting
8 rules require that a soil balance be performed as part
9 of application material?

10 A No, they do not.

11 Q You testified this morning that the
12 permeability or hydraulic conductivity requirements that
13 have to be met for liner material refer to a hydraulic
14 conductivity that must be achieved for that material?

15 A Yes.

16 Q What do you mean when you say "must be
17 achieved"?

18 A That means that going back to the Liner Quality
19 Control Plan, one of the requirements is we do -- as the
20 liner is constructed, we're required to do in-place
21 testing of that material after it's placed and run
22 permeability tests to determine that -- that it has that
23 permeability or less. If not, then that area has to be
24 broken up, re-worked, recompacted.

25 Q Is there a requirement that material used for

1 liner construction must meet that hydraulic conductivity
2 standard in its in situ condition?

3 A No.

4 Q Okay. So the time of testing is after the
5 material has been prepared and compacted?

6 A Yes. The preconstruction test that I talked
7 about earlier that we used to qualify the material, we
8 take the material and we process it and we remold it to
9 the density that it will be compacted to. And that
10 tells us that we can compact it, and we can achieve
11 that. Then once we put it in the field, we have to test
12 each lift on a frequency to determine that we did
13 achieve that. And then all that information is sent to
14 the TCEQ for approval before the liner is approved.

15 Q Now let's look at Volume 7, Exhibit Adams 5.
16 On Page 2 --

17 A Okay.

18 Q -- that's a chart that you had prepared that
19 you testified about earlier?

20 A Yes.

21 Q In your opinion, would the material within the
22 light green shaded area be able to achieve that
23 hydraulic conductivity standard, 1 times 10 to the minus
24 7 centimeters per second?

25 A Yes, I would -- I would presume that it would,

1 although that is a separate test than these.

2 Q Okay. And that material will be tested to
3 ensure that that happens --

4 (Simultaneously speaking)

5 A Yes. That's another requirement on top of the
6 Atterberg limits.

7 Q (BY MR. RYAN) Let's look in Volume 4 at
8 130EP -- Exhibit 130EP-4, Page 176 and 177.

9 A All right.

10 Q And what's set out on these two pages?

11 A That's a summary of the laboratory results.

12 Q From the 2013 borings?

13 A Yes, that's from the 2013.

14 Q And did you testify -- when you testified
15 earlier that the rules require testing to be done on at
16 least one sample within each stratum --

17 A Yes.

18 Q -- would that be Stratum I, Stratum II, and
19 Stratum III for this site?

20 A Yes.

21 Q And if we wanted to know how many samples were
22 tested during the 2013 site investigation, could we
23 count up the number of lines under each section:
24 Stratum I, Stratum II, and Stratum III?

25 A Yes.

1 Q In your opinion, did you have enough samples
2 from sufficient locations to be able to appropriately
3 prepare the boring logs that appear in Exhibit 130EP-4?

4 A Yes, I did.

5 Q And in your opinion, did you have enough
6 lab-tested samples from the 2013 boring investigation to
7 prepare those logs and characterize the soils?

8 A Yes, I had -- had plenty.

9 Q I think that's it for Volume 4. Let me ask you
10 about one more thing in Volume 3 at 130EP-3, Page 434.
11 Now, I think you testified earlier that the two tables
12 on 434 and 435 identify the tests that will be used
13 during testing of the liner material?

14 A During construction.

15 Q Yes, during construction of liner material.
16 Right?

17 A Yes.

18 Q Okay. And the references there to standards,
19 what are those?

20 A That is the ASTM standards that we -- that's
21 the test we're specifying to be done.

22 Q Okay. And that's a -- those are test methods
23 that are specified by some organization?

24 A Yeah. Well, the ASTM prepares the test -- the
25 standard that tells how to do the test. The

1 regulations -- some of the tests are required by the
2 regulations, these specific tests.

3 Q Okay. And then under Coefficient of
4 Permeability, I notice it refers to either an ASTM
5 standard or a COE?

6 A That's a Corps of Engineers.

7 Q Okay. So that's an either/or?

8 A Yes.

9 Q And do the rules specify --

10 A Either/or.

11 Q -- either of those can be used?

12 A Yes.

13 Q Okay. Do you have a set of the rules there?
14 Would you look at 330.63(e)(5)?

15 JUDGE QUALTROUGH: I'm sorry, what letter
16 was that?

17 MR. RYAN: (e).

18 JUDGE QUALTROUGH: "E" as in --

19 MR. RYAN: Yeah, E.

20 A Which one?

21 Q (BY MR. RYAN) E.

22 A E?

23 Q 63(e)(5), I think. Yes. Let me know when
24 you're there.

25 A All right.

1 Q To help you a little bit, it's the one that
2 refers to the ASTM standards.

3 A Oh, okay. I think I -- (e)(5).

4 Q You got it?

5 A Yes.

6 Q 330.63(e)(5). And if you look in Subsection B
7 of that, down in little Roman (i) through (iv), is there
8 a listing of testing procedures for various tests?

9 A Yes, there is.

10 Q And with one exception, are those all -- well,
11 that's not right. With two exceptions, are those ASTM
12 standards?

13 A Yes.

14 Q And are those two exceptions Corps of
15 Engineers' standards?

16 A Yes, they are.

17 Q And, now, these apply not to construction but
18 to site investigations done in connection with
19 preparation of a geology report. Is that right?

20 A That's correct.

21 Q And were those standards followed in connection
22 with the site investigations done by BME in 2013 and
23 2016?

24 A Yes.

25 Q Did the fact that you had less than 100 percent

1 recovery during sample collection operations affect your
2 ability to properly log borings in this case?

3 A No, it did not.

4 Q Okay. I want to -- last thing I want to ask
5 you about is the shape of the landfill footprint. Can
6 you suggest a drawing that we might use to do that?

7 A Well, since I have Exhibit 3 --

8 Q How about Page 19 of Exhibit 3, Exhibit
9 130EP-3, Page 19?

10 A Yep, that would -- well, we want to talk about
11 the shape, there's a few other items --

12 Q Okay.

13 A -- that's related to the shape. So I had a --
14 oh, it would be Page 25.

15 Q Page 25 of Exhibit 130EP-3?

16 A Yes.

17 Q Okay.

18 A Has a little more detail on it there.

19 Q Okay. You were responsible for the landfill
20 design?

21 A Yes.

22 Q Are you the person who decided on the shape of
23 the landfill footprint?

24 A Ultimately, the shape of the landfill I was --
25 I decided that. You have to remember, it's an iterative

1 process, and so it -- it involves a lot of other items.

2 Q How did you go about doing that?

3 A Well, before I become involved in the project,
4 the location, general location, of where the landfill
5 was set had been decided. So I wasn't involved in where
6 the landfill is going to be.

7 Once that's decided, then the next step
8 was we start gathering information and finding out
9 where -- within that, what restrictions do we have. The
10 restrictions can be floodplains, wetlands,
11 jurisdictional water streams, a number of things that
12 could restrict. They don't have to because there are
13 mechanisms for even building in those areas if you do
14 mitigation. But the Applicant had directed us to just
15 avoid those areas.

16 And so basically we took the location on
17 the property where they wanted to build the landfill,
18 and then we started to draw in the setbacks, the items
19 that would be restrictions. And then within that, we
20 had to allow room for drainage structures and ponds
21 because we -- we didn't want those into those areas.
22 And so all of those things together, we would come up
23 with a footprint. Here's something that's available.

24 Then we would look at it, and the
25 iterative process is -- remember we start with the

1 footprint, then we start have to estimate, well, how big
2 would the ponds and ditches be for that footprint?
3 Well, that might tweak the footprint a little more. And
4 we send to the client, and they say, okay, you know,
5 they review. They give comments on that. Comes back,
6 more information may come in. We look at -- we start
7 with the FEMA floodplain, then we get more floodplain
8 data from the site specific. That might move an area a
9 little bit. So that's why I say it goes through an
10 iterative process.

11 Once we start to rough it in, the next
12 phase is, we have to set an elevation along the
13 perimeter enable to -- so that way we could calculate
14 the total of the slope, how much fill will it require,
15 because we want those fill areas outside of some of
16 these areas.

17 So that's how the process goes. It's --
18 we do something. We calculate it. It may require some
19 tweaking. And in all that process, this is what we
20 ended up with.

21 Q You talked about consideration of how much --
22 how much area would be required for the necessary size
23 of ponds and ditches. In this case, did you design
24 ponds and ditches that are larger than the rules
25 require?

1 A Yeah, because in the process of doing this, we
2 wanted to make sure we had enough room. So in places we
3 had them sized in ponds, we calculated in they were more
4 than large enough, but we didn't change the size of
5 them.

6 Q And did the client want to ensure that that
7 perimeter drainage system was sufficient to manage the
8 runoff from back-to-back 100-year storm events?

9 A Yes.

10 Q And what do the rules require in terms of
11 sizing of those features?

12 A Sizing of the storm --

13 Q Stormwater system.

14 A I'm not sure on that drainage rule.

15 Q Okay.

16 A Another thing -- and so we talked about the
17 irregular shape of the landfill, or as I've heard it
18 earlier referred to as the organic shape. Now, I assume
19 that's an Austin term, because it's not one I would have
20 used. But -- and I think the note was that it's common
21 that we see some landfills that have a rectangular
22 shape, and that has to do something with the engineering
23 in us. Engineers, we like things straight and
24 rectangular and long lines of sight. Part of that comes
25 from people like me. In the early days, we calculated

1 these by hand. And so the simpler the geometry, the
2 fewer calculations we had to run. Now we have tools
3 that have really changed that. And so with the modern
4 design tools that we have to design in three dimensions,
5 irregular shapes are not hard to design. They're
6 relatively easy to design.

7 Q What about construction of irregular shapes?

8 A The same thing, same process. In the early
9 days, we used to stake them out and grade them. We had
10 to have a grade checker, and we had a theodolite or a
11 transit and a guy pulling a hundred-foot tape and
12 driving grade stakes.

13 And so, again, the odder the shape, the
14 more stakes you had to set, and the harder it was to cut
15 those. Now the models that we can come up with in our
16 3D modeling packages, which are true surfaces, go
17 straight into the construction equipment. And they
18 basically -- if we can design it, they can build it and
19 cut it.

20 So the industry has come along, and it's
21 really changed the way we design and the ease of
22 designing and building and constructing these things.

23 Now, in this case, as I said, a lot of
24 times, as engineers, we want to line them up because
25 it's economically efficient. If we have four corners,

1 then you can get more waste into a smaller area. That
2 means more waste, and you're buying less liner and less
3 final cover.

4 The Applicant here give us the directions,
5 no, we want to avoid these items. We don't want to
6 mitigate them. Stay out of the streams. And so that
7 created this shape as you see where it comes in in
8 places.

9 So they sacrifice, you know, some of the
10 efficiency that we like to try to give them because they
11 wanted to stay out of these areas, and that's how it
12 resulted in this shape.

13 Q Now, when you say "efficiency," you're not
14 referring to the ability to construct or operate?

15 A It's a economic deficiency.

16 Q They'll end up making less money?

17 A Yeah, you have to build more liner for the
18 amount of waste. If you build less liner, then it's a
19 little bit cheaper for the same amount of incoming
20 waste.

21 MR. RYAN: Thank you. I'll pass the
22 witness.

23 JUDGE QUALTROUGH: Mr. Wilson, should we
24 take a break now, or which -- would you like to begin
25 your recross? We've been going for about an hour and a

1 half.

2 MR. WILSON: I just have one question.

3 JUDGE QUALTROUGH: All right. Let's take
4 your one question, then.

5 RECROSS-EXAMINATION

6 BY MR. WILSON:

7 Q Mr. Adams, looking at EP-3, Page 25, which I
8 think is the exhibit you just looked at?

9 A Yes, sir.

10 Q I noticed that there is a blue line on here.
11 Does that represent the floodplain?

12 A That represents the floodplain that -- for the
13 site-specific calculations.

14 Q Does it represent also the Plum Creek
15 Conservation District easement limit?

16 A I don't believe it does on this drawing.

17 MR. WILSON: Thank you.

18 JUDGE QUALTROUGH: All right. Executive
19 Director?

20 MR. TATU: No.

21 JUDGE QUALTROUGH: No recross?

22 OPIC?

23 MR. TUCKER: Yeah, just a few.

24

25

1 RE CROSS - EXAMINATION

2 BY MR. TUCKER:

3 Q Good afternoon. If you could stay on
4 Applicant's Exhibit 130EP-3, Page 25. The hundred-year
5 floodplain indicated on this map, that's the floodplain
6 that was produced by Mr. Traw?

7 A Yes.

8 Q And this map does not have the FEMA floodplain?

9 A This map does not.

10 Q And the FEMA floodplain map differs from the
11 hundred-year?

12 A Yeah, actually, I do have a map that shows both
13 of them on the same drawing.

14 Q Okay.

15 A If you would go to -- I guess this is Volume 7,
16 Applicant's exhibits, will be Applicant's Exhibits Adams
17 1, and that would be on Applicant's Exhibits Adams 4,
18 Page 2.

19 Q And so turning to Applicant's Exhibit Adams 4,
20 Page 2, the FEMA Zone A floodplain, that's the lighter
21 blue, dashed line?

22 A Yes.

23 Q Okay. And the darker blue solid line, that's
24 the hundred-year floodplain?

25 A Yes.

1 Q And when we say the hundred-year floodplain,
2 that's the one modeled by Mr. Traw?

3 A That's the one that -- yeah, it's explained in
4 Note 4 of that drawing.

5 Q And you were talking about how the floodplain
6 influenced the shape of the landfill design. Were you
7 referring to the floodplain modeled by Mr. Traw or the
8 FEMA Zone A floodplain?

9 A Actually, both of them do. If you were to
10 look, there are areas where the FEMA floodplain is
11 closer to the landfill. We moved up out of that. And
12 then there are some areas where the modeled floodplain
13 is closer than the FEMA.

14 Q And how close does the landfill footprint get
15 to the floodplain?

16 A From this drawing, I can't tell you in feet how
17 close. In the drawing it illustrates that it's out of
18 it.

19 Q Is that a measurement -- could we determine the
20 distance from any of the maps in this application?

21 A You might could. I mean, now, in -- in the
22 copies we have here, these maps have been scaled down
23 for copying purposes. So it would be difficult to do
24 that, but --

25 Q Is that something y'all calculated?

1 A How far?

2 Q How far the footprint was.

3 A No. We did not have -- I mean, our requirement
4 was to be out of them. We did not have a requirement of
5 how far to be out.

6 Q But was that some -- so that was not
7 something -- a calculation that y'all made?

8 A It -- it's not -- no, it's not something
9 that -- I mean, and we wouldn't calculate. We would
10 measure it in a CAD drawing. It's not something that I
11 tabulated.

12 Q Not something either you or Mr. Traw
13 calculated?

14 A I don't know about Mr. Traw. I'm only speaking
15 for the work I did on setting the footprint.

16 Q Are you aware of any -- anyone else, any of
17 your colleagues that may have done that measurement?

18 A No, I'm not aware of it.

19 MR. TUCKER: Okay. Thank you. That's all
20 my questions.

21 JUDGE QUALTROUGH: All right. Is this a
22 good time to take a break?

23 MR. ALLMON: Yes.

24 JUDGE QUALTROUGH: Okay, good. We'll be
25 back in about ten minutes, so about 2:40. All right.

1 We're off the record.

2 (Recess: 2:28 p.m. to 2:47 p.m.)

3 (Exhibit Protestants No. 41 marked)

4 JUDGE QUALTROUGH: All right. Mr. Allmon,
5 you ready?

6 RECROSS-EXAMINATION

7 BY MR. ALLMON:

8 Q Good afternoon, Mr. Adams. Could we look back
9 Exhibit 130EP-3, Page 25?

10 A Yes.

11 Q There's been some discussion of this -- there
12 was discussion on redirect of the shape of the landfill
13 and of some of the safety factors involved here, and I
14 want to follow up on that a little bit.

15 Now, when you performed the analysis, say,
16 for that circular arc failure that is shown in the
17 figure behind you, you used a certain modeling program
18 for that. Correct?

19 A Yes.

20 MR. RYAN: Objection. I didn't do any
21 redirect about slope stability failures and arc
22 failures.

23 JUDGE QUALTROUGH: Can you tie that to the
24 redirect?

25 MR. ALLMON: Yes, Your Honor. There were

1 questions regarding the shape of the landfill, and he
2 explained, oh, this shape is acceptable because we have
3 modern programs to run this and evaluate this, and it's
4 no longer necessary to have them in the shape of a
5 rectangle. And he also described how the safety factors
6 were adequate with 1.5 and 1.3 and such. And I was just
7 going to explore how this modeling with the shape of the
8 landfill may not be appropriate with the safety factors
9 involved.

10 JUDGE QUALTROUGH: All right. I'm going
11 to overrule your objection.

12 Q (BY MR. ALLMON) So staying on EP, 25, so you
13 used a certain modeling program for the failure
14 analysis. Correct?

15 A Yes.

16 Q Does that modeling program make any type of
17 assumption in terms of the slope -- shape of the slope
18 as you go from, say, side to side?

19 A The slope for the section is an input.

20 Q And I guess I'm going to try and find the
21 proper technical term for it. We have on the board,
22 you've drawn a profile view of a slope. Correct?

23 A Correct.

24 Q Now -- and, of course, in three-dimensional
25 space, the slope is going to extend kind of towards us

1 and away from us as well?

2 A Correct.

3 Q And that modeling program, does it make any
4 assumptions as to whether that -- as it extends in both
5 of those directions, whether it curves or whether it is
6 straight?

7 A No. That's a two-dimensional model.

8 Q So it doesn't consider any curvature that may
9 be in another dimension?

10 A No.

11 Q Okay. So let's look at EP, 25 -- EP-3, Page
12 25. Do you see where there's a kind of an indentation
13 in the landfill footprint in the vicinity of Pond 5?

14 A Yes.

15 Q So if we were to look at the potential for a
16 slope failure just south of where that Pond 5 is
17 located, would the toe of the landfill be that area
18 that's marked Pond 5?

19 A Which side of the indentation are we talking
20 about?

21 Q The -- on this figure, the -- the south side of
22 that indentation.

23 A On the south side of the indentation.

24 Q Would it be possible to have a circular failure
25 that resulted in upward force kind of in that vicinity

1 of where the word Pond 5 is located?

2 A You could analyze it there.

3 Q Yeah, but that is kind of one of the type of
4 failures you would -- the program would analyze?

5 A Yes.

6 Q And at that same spot kind of within that
7 indentation, looking at the north, there's a slope there
8 on the north. Would it also -- could it also be
9 possible that a failure were warranting analysis --
10 well, that a failure could occur with a plain that
11 places that upward force also in the area where we've
12 got the word Pond 5?

13 A You could analyze there, also.

14 Q So in that case, in reality, at this facility,
15 we would have upward forces at that location from two
16 different sides?

17 A No. You would have to have failure there to
18 have force.

19 Q That's what one would analyze would be kind of
20 whether the upward forces at that location are offset
21 adequately, but the two slopes on each side would each
22 be exerting an upward force?

23 A No. They would only exert a force upward if
24 there were movement.

25 Q But that's what the model program is helping us

1 to evaluate, is whether there's enough force in the
2 other direction to counter that?

3 A Yes.

4 Q And, likewise, if we look to the east of that
5 word -- that inlet, would that be another area where the
6 slope would be rotationally exerting a force upward?

7 A No. The slope doesn't rotate -- doesn't exert
8 a rotational force on every plain. We look for the
9 plane where that could happen.

10 Q And the kind of idealized concept of a circular
11 arc failure, that would be an upward force there in the
12 area of Pond 5 in contrast to your driving force on the
13 side of the slope?

14 A I'm not sure I understand your geometry.

15 Q Essentially, when you've got a circular arc
16 failure, you would have a block that is rotating in
17 failure. Is that correct?

18 A Yes.

19 Q Yes. And so as we look south, there's the
20 potential there to have a failure where you have a block
21 rotating with the slope of the landfill going down while
22 the area within that inlet is being pushed up. Is that
23 correct?

24 A No. I wouldn't say there's a potential. I'm
25 saying you can evaluate the potential there.

1 Q But physically, that is something you need to
2 evaluate whether that would happen?

3 A Well, the evaluation that we did did evaluate
4 that.

5 Q But there's also at that location the potential
6 for, say, a rotation from the landfill to the north of
7 that area where you would have the slope going down with
8 forces pushing up at that same spot. Is that a
9 potential one would evaluate?

10 A The evaluation was for the typical properties
11 of the side slope. We looked at the critical section.
12 The critical section would be, where do we have the
13 longest side slope? And so we don't evaluate every side
14 slope, because we evaluate the longest side slope for
15 this liner configuration.

16 Q Does the model that you used account for a
17 situation where you may have upward pressures from
18 separate directions?

19 A I don't understand your idea of "upward
20 pressures."

21 Q Well --

22 MR. RYAN: I'm going to object. I didn't
23 ask any questions about arc failure modeling. He said
24 he was going to ask questions about factors of safety.
25 He's not asking about factors of safety; he's asking

1 about -- about circular arc failure modeling. And I
2 didn't ask any questions about that.

3 JUDGE QUALTROUGH: Right, but you did ask
4 questions about the irregular shape and why sometimes
5 they're rectangular and sometimes -- and in this one,
6 it's curved.

7 MR. RYAN: But he's not asking him that;
8 he's asking about circular arc failures.

9 JUDGE QUALTROUGH: I think he is because
10 of the way the irregular shape of the footprint curves
11 back in. So I think he's within your redirect.

12 Q (BY MR. ALLMON) So within this inlet, there's
13 a potential for evaluation of a circular arc failure
14 that may come from both a slope to the north and a slope
15 to the south?

16 A I could evaluate any slope in any direction.

17 Q But so far as physically speaking -- well, as
18 we look at the potential plains of failure, there could
19 be a block that would slide from the north with certain
20 pressures and a block sliding from the south with
21 certain pressures?

22 A We're talking about circular or block rotation?

23 Q Let's talk circular failures.

24 A Circular.

25 Q Circular. There would be certain driving

1 forces that would be pushing up within that area?

2 A Pushing up?

3 Q Yes.

4 A No. I don't -- I don't understand the "pushing
5 up" comment.

6 Q Well, in the figure behind you, that is
7 depicting what would happen when a failure were to
8 occur?

9 A Yes.

10 Q And you showed that there would be soil lifted
11 up at the bottom part of the --

12 A Yes, if failure occurs.

13 Q And why would that soil be lifted up?

14 A Because it's being displaced from here to here
15 (indicating).

16 Q Okay. Would that block beneath it, that soil
17 beneath it, move in any way?

18 A Talking about the soil on this side of the
19 plain?

20 Q Yeah.

21 A No.

22 Q Would there be pressure exerted in that area of
23 Pond 5 when you have a circular failure?

24 A The pressure is along the plain we analyzed.
25 That's what we're analyzing, how much resistance do we

1 have along this plain for the force we have along the
2 plain. So we're actually looking at a plain, a specific
3 plain. As you remember in the pictures, we analyzed the
4 green lines. We analyzed multiple ones so much that it
5 just covers the whole area.

6 Q And so your model, as you said, is
7 two-dimensional?

8 A Yes.

9 Q It's not looking at a situation where you may
10 have forces coming from several different directions?

11 A No. It's looking at one particular plain in
12 two dimensions.

13 Q And so is it possible that when you've got an
14 irregular shape with kind of a indentation such as this,
15 that you could have forces from different directions
16 that that model doesn't account for?

17 A Are you saying they would have two slopes
18 failing simultaneously?

19 Q No. I'm saying that you could have certain
20 pressures and forces exerted on those materials by
21 virtue of directions from other dimensions not accounted
22 for in that model that would make it more likely failure
23 to occur than perhaps that model would reflect?

24 A Not more likely, no. If you look at some -- if
25 you look at the geometry and the slopes, if you start to

1 look from other directions, the slope is -- from that
2 point out, the slope actually becomes flatter if it's
3 skewed to the slope. We look at the steepest direction
4 for the slope, which will be perpendicular.

5 Q Did you run any type of modeling to evaluate
6 this particular shape and how the slopes pointed towards
7 each other could interact?

8 A Of how these two pointed toward each other
9 could interact? No, I did not think that would be
10 appropriate.

11 Q Could that have an impact?

12 A I do not believe so. Based on what you've
13 described to me, I can't -- I cannot -- I can't
14 comprehend the forces that you're trying to describe.

15 Q Is there an aspect -- given that you used a
16 two-dimensional model, and you've got an
17 irregular-shaped landfill, is it possible that model did
18 not account for the overlap of forces that may occur?

19 A Overlap of forces, I guess -- there's two
20 forces you're talking about just from the weight of the
21 landfill?

22 Q Yes. Well, each time we're evaluating for
23 slope stability, I think you noted we're looking at
24 different opposing forces to see if a failure is going
25 to occur. Correct?

1 A Yeah. But at the same time that you're not in
2 two dimensions, you're looking at the forces on that
3 two -- on that plain, and we're also looking at the
4 resistance on that plain. If I were to include the
5 forces laterally from it, I would have to include the
6 resistance laterally from it.

7 Q And your two-dimensional model doesn't do that?

8 A No. The two-dimensional models look at -- it
9 looks at a certain -- at one plain.

10 Q And -- but here, when you have this type of
11 irregular shape, can you have forces that overlap in a
12 way that -- well, when you have an irregular shape that
13 is concave, can you then have forces that overlap in a
14 way that they do not overlap when you have, say, a
15 straight side of a landfill?

16 A I guess I'm not following what you're -- what
17 you're describing.

18 Q Can you -- when you have a concave shape of a
19 landfill, such as that in the area where we've got Pond
20 5, can you have forces overlapping with each other due
21 to that shape that are not accounted for in a
22 two-dimensional model?

23 A Well, two dimensional model accounts for the
24 forces that are within that slice. And so it doesn't
25 account for what's beyond the slice, nor does it account

1 for the resistance beyond that slice. Now, within a
2 concave, as you're describing, for something to slide on
3 that, you would actually get more compression from the
4 sides trying to hold it in.

5 Q But, now, also would you not have some of that
6 area at the bottom subject to forces to help that would
7 cause a slope failure? Would you have certain
8 resistance that's absent?

9 A At the bottom?

10 Q Yes.

11 A I'm sorry, I'd -- you'd have to draw me a
12 picture or give me more than that.

13 Q Well, I guess, generally, does -- your
14 two-dimensional model doesn't in any way account for the
15 irregular shape of this landfill?

16 A No, it does not.

17 Q Okay. And you don't know whether that model
18 was developed with an assumption of a straight side of a
19 landfill or an irregularly shaped landfill?

20 A No. It's a two-dimensional. It only looks at
21 the 4 to 1 slope. It does not look laterally beyond
22 that to different slopes.

23 Q Is that what we refer to as kind of an infinite
24 slope model?

25 A No.

1 Q And this, as I said -- so we noted your model
2 didn't necessarily account for -- doesn't necessarily
3 address -- addresses two dimensions, not this
4 three-dimension. Now, as we look at our factor of
5 safety, I think there are certain uncertain -- you've
6 got a model that has certain idealized assumptions. Is
7 that correct?

8 A They have assumptions, yes.

9 Q Assumptions. And one of those assumptions
10 we've just been walking through is that is a
11 two-dimensional model?

12 A Yes. It's a two-dimensional model.

13 Q And, of course, we live in a three-dimensional
14 world. Correct?

15 A Oh, I didn't realize that was a question. Yes.

16 Q We do -- we live in a three-dimensional world,
17 so in that way, the model is not a precise relation to
18 reality?

19 A No, I would not agree with that. The
20 two-dimensional models have been used for years, and
21 they have a long track record of making very good
22 predictions.

23 Q But as we look at the assumptions of the model
24 and what the real world conditions are at this site, the
25 model is considering only forces in two dimensions;

1 whereas the forces at the site are going to be exerted
2 in three dimensions. Is that accurate?

3 A Yes.

4 Q And in that way, the model does not -- the
5 assumptions of the model don't precisely match reality?

6 A They do not account for -- the two-dimensional
7 model does not account for three dimensions.

8 Q Three-dimensional forces. And some of those
9 forces from, let's say, the third dimension could
10 influence -- could some of those other forces that are
11 unaccounted for influence the likelihood of a failure?

12 A The likelihood of a failure?

13 Q Yes.

14 A Those forces could add more driving weight or
15 more resistance or both.

16 Q So, yes, they could impact the likelihood of a
17 failure, those forces from another dimension other than
18 the two dimensions dealt within the model?

19 A Well, I guess I have trouble saying the
20 likelihood for a failure when we have a slope that's not
21 predicted to fail.

22 Q But, of course, the purpose here is to evaluate
23 the potential for a failure and -- conceptually, as
24 you're looking at that. This two-dimensional model is
25 considering forces in those two dimensions?

1 A Yes.

2 Q And as we take that modeling as we look at the
3 real world, there will be dimensions -- there will be
4 forces from a third dimension being exerted on the same
5 soils?

6 A Yes.

7 Q And those forces are not accounted for in the
8 model?

9 A Correct.

10 Q And so could those forces not accounted for in
11 the model influence the likelihood of a failure?

12 A Could they influence the likelihood? Yeah,
13 they could have influence either good or bad.

14 Q Either good or bad. So -- and then we've also
15 discussed in running the model, you made certain
16 assumptions regarding the weight of the waste?

17 A Yes.

18 Q And we discussed that the waste might weigh
19 more; it might weigh less --

20 A Yes.

21 Q -- in reality?

22 MR. RYAN: Objection. This is beyond the
23 scope of redirect.

24 JUDGE QUALTROUGH: Well --

25 Q (BY MR. ALLMON) Now, your factor of safety --

1 let me -- you haven't set a factor of safety of 1.0.
2 Correct? You've set factors of safety -- you've looked
3 at it and said, okay, a factor of safety of 1.8 is
4 acceptable?

5 A I haven't -- repeat the question, please.

6 Q Yes. Looking -- let's turn back to the page
7 where your factors of safety are set forth. Will you
8 turn to that page, please? That's 130EP-3, Page 78.

9 A Okay.

10 Q And here you have certain recommended factors
11 of safety and calculated factors of safety?

12 A Correct.

13 Q And, for instance, when we look at, say, a
14 sliding block failure, you've said that you calculated a
15 factor of safety of 1.8 in comparison to a recommended
16 factor of safety of 1.5?

17 A Correct.

18 Q Is one reason -- so you didn't just run your
19 model and find that as long as it's that 1.0, it's
20 acceptable?

21 A No. The lowest factor of safety, by looking at
22 many sections for the landfill in that particular
23 failure mode that I was able to generate, was 1.8. That
24 was the lowest that I could generate.

25 Q And do we use factors of safety, in part, to

1 account for the uncertainties in modeling?

2 A Yeah, that's why we have something like the
3 recommended of 1.5.

4 Q And do we use factors of safety, in a sense, to
5 account for uncertainties in the assumptions?

6 A Well, that would be the same thing as
7 uncertainties in modeling.

8 Q And so, for instance, this fact that you have
9 forces from another outside of these two dimensions that
10 are influencing the outcome, that's one reason that you
11 want to use a factor of safety. Correct?

12 A That could be one reason.

13 Q And the kind of variance, potential variance,
14 in your assumption regarding the weight of the waste
15 would be another reason why we would use a factor of
16 safety?

17 A Well, yeah, any material property.

18 Q Yeah.

19 A Not just the waste.

20 Q It's not just the waste. So like the weight of
21 the waste, the sheer strength of the waste, as well as
22 you made certain assumptions regarding the homogeneity
23 of the materials. Correct?

24 A Say it again now.

25 Q As we look at what type of uncertainties go

1 into the calculations, you made assumptions regarding
2 the homogeneity of the material involved, the consistent
3 properties of that material.

4 A Oh, yes. Yes, particularly in the waste. We
5 use -- we use one set of parameters for the entire waste
6 column.

7 Q Just as you used one set of parameters for the
8 liners?

9 A Yes. And in these calculations, the liner,
10 since it has many components, typically tried -- we
11 would pick the weakest of the -- of those.

12 Q And, say, for instance, in this case you
13 disregarded or did not account for the swales on the
14 site. And that's another type of uncertainty intended
15 to be addressed by the factor of safety?

16 A No, not really the factor of safety. I
17 disregarded the swales because they're just negligible
18 in the calculation. They don't change the calculation
19 substantially.

20 Q Well, I guess -- but the inclusion of a factor
21 of safety is one thing it intended to try and address,
22 say, some of those factors that are not directly
23 considered in the model? Your -- by virtue of not
24 considering the swales, the kind of description of the
25 facility that you provided as input to the model was not

1 exactly correct. Is that accurate to say?

2 A No, that would not be accurate.

3 Q Well --

4 A It --

5 Q -- you provided -- when you went to put in an
6 input to the model regarding the nature of the thickness
7 of the cover, what thickness did you provide to the
8 model?

9 A When I put in for the -- for which analysis?

10 Q For the final waste slope analysis. Would that
11 include a consideration of the final cover?

12 A Yeah, I put in the cover thickness.

13 Q What cover thickness did you use?

14 A Well, it's hard to tell from here because these
15 thicknesses are in X-Y plots, I'm trying to find, and I
16 can't scale it off of here. What I would typically use
17 would be this one has -- should be three and a half
18 feet.

19 Q Given the presence of these swales, at all
20 points is the cover three-and-a-half-feet thick?

21 A At the -- where?

22 Q As we looked up and down the slope and the
23 final cover, is it three-and-a-half-feet thick at all
24 points?

25 A No. It would be thicker at the swales.

1 Q Okay. So in that sense, reality differed from
2 the inputs of what you modeled?

3 A Yeah. The preciseness would be different.

4 Q And the factor of safety is intended to account
5 for that lack of position. That's one function the
6 factor of safety helps to account for?

7 A Yeah. I mean, yeah, we take -- we take a
8 surface, and we do have to do some simplification of the
9 surface.

10 Q And when we sit down to determine a factor of
11 safety, it needs to kind of offset all of these
12 different uncertainties?

13 A Yeah, that would be one reason that we
14 calculate a factor of safety.

15 Q You were asked questions regarding some of the
16 lab testing that you did, and could you turn again to
17 330.63(e)(5)?

18 A Okay.

19 Q Give me just one quick second. Does (e)(5)
20 require sampling from particular -- the sides of the
21 landfill?

22 A I'm sorry, could you ask that again? I didn't
23 hear.

24 Q Do the regulations require -- if you could look
25 with me 330.63(e)(5), then upper case (A). Are you

1 there?

2 A Yes, I see that.

3 Q Do you see where that reads, A laboratory
4 report of soil characteristics determined from at least
5 one sample from each soil layer or stratum that will
6 form the bottom and side of the proposed excavation and
7 from those that are less than 30 feet below the lowest
8 excavation of the -- elevation as opposed to excavation.
9 Do you see that?

10 A Yes.

11 Q When you have an irregular shape such as this,
12 how many sides of the landfill are there?

13 A The sides?

14 Q Yes.

15 A There's one. It's continuous all the way
16 around.

17 Q So this landfill, in your opinion, has only one
18 side?

19 A Of the side slope?

20 Q Yes.

21 A Well, yes.

22 Q Is it not -- so you don't interpret this as
23 requiring, say, a sample from the east side of the
24 landfill as well as the west side and each point where
25 you have a side established for the landfill? You

1 interpret this as meaning you have only one side of the
2 landfill?

3 A Yes.

4 Q Okay. And I guess you would interpret -- do
5 you interpret this landfill as having one single bottom?

6 A Yes, it has a bottom.

7 Q So you did not look at the different -- is it
8 not completed at -- are different areas of the landfill
9 excavated at different depths?

10 A Yes.

11 Q And so in bottoms of the landfill in different
12 areas, are you in different portions of the formation?

13 A I'd have to go back and look at it, but I --
14 probably so.

15 Q And could the characteristics of the soil vary
16 depending on those differing excavation depths?

17 A The characteristics of the soils vary?

18 Q Yes.

19 A Yeah, but the requirement is that we have at
20 least one test from each layer that's encountered in the
21 side, each layer. So I believe that Stratum I would be
22 encountered solely in the side. Stratum II would be
23 encountered in the side and in the bottom. And Stratum
24 III, I would have to look and see if it's in the side
25 and the bottom. But all three strata are encountered by

1 the excavation.

2 Q And as we look at 330.63, I think we're in
3 (b) (5) (A), staying there, does it report -- require a
4 laboratory report from at least one sample from each
5 soil layer?

6 A It says "at least."

7 Q Now, is the characterization of the
8 geotechnical and geological qualities at a site a very
9 site-specific type of determination?

10 A What is the question?

11 Q When you're determining the amount of
12 information needed to characterize a landfill site, is
13 that a very site-specific determination?

14 A Yes.

15 Q And so if one sample may be adequate at a
16 certain landfill site, it may be that one sample isn't
17 adequate at another landfill site?

18 A Correct.

19 Q You looked earlier at a figure showing certain
20 plasticity limits and liquid limits in comparison to the
21 requirements at the site. Could you turn to that page
22 again?

23 A Can you tell me which --

24 Q You have a certain graph that you put together
25 that you reviewed with Mr. Ryan depicting the liquid

1 limits and other limits at the site. Could you turn to
2 that page? I think that's Adams 5.

3 A Yes, I have found it.

4 Q What does -- so we've got a liquid limit of 50
5 depicted on here?

6 A Yes.

7 Q Just help -- what does liquid limit mean?

8 A The liquid limit is the moisture content at
9 which the soil -- it's the break point between the soil
10 acting as a plastic, or semisolid, and a liquid. So
11 there's a certain moisture content when you put -- it
12 gets wet enough that that soil begins to take on
13 characteristics of a liquid. And that's what we term as
14 the liquid limit.

15 Q And that's why you want to have a certain limit
16 there, is to make sure your soil doesn't just turn into
17 a liquid on you?

18 A No. It's a -- I mean, we're not trying to keep
19 the soils from turning into a liquid. That is just a
20 way that we characterize soils.

21 Q Uh-huh. Now, you have testing -- here you have
22 green triangles designated as TJFA 2016?

23 A Yes.

24 Q Does that reflect the results of samples of lab
25 testing performed by TJFA or lab testing performed by

1 the Applicant?

2 A That was by TJFA sample or results that were
3 provided to us.

4 Q Where are the limits that you charted on here,
5 where are those found again in the application?

6 A Which limits?

7 Q The -- you've got a certain liquid limit and a
8 certain -- certain parameters here that you've charted
9 as being the parameters acceptable at the landfill. And
10 those are set forth in your application?

11 A Yes. That would be in Volume -- or Exhibit 3,
12 Page 432.

13 Q And so as we compare Page 432 with your chart
14 on Adams 5, the chart deals with the plasticity index
15 and the liquid limit?

16 A Yes.

17 Q Does it address the percent passing the number
18 200 mesh sieve?

19 A No, it does not.

20 Q Okay. Is that a quality that the soils would
21 need to meet in order to be suitable for use?

22 A Yes, in accordance with the table.

23 Q Okay. But you -- but this doesn't establish
24 that the soils on-site meet that requirement?

25 A Not this chart.

1 Q Not this chart?

2 A This chart also doesn't establish what the
3 permeability is. This chart addresses the Atterberg
4 limits, if they're acceptable.

5 Q Did -- do you have any testing to show that all
6 samples at the site meet this test for the passing the
7 number 200 mesh sieve?

8 A I would have to -- what I have in front of me
9 is what's in the -- what's in the application. And I
10 believe all of the samples -- or all the samples from
11 two and three, at least, meet that.

12 Q Do the samples from Stratum I meet that?

13 A Not all the samples from Stratum I.

14 Q And as we look at coefficient of permeability,
15 is that something that is tested in situ or prior to
16 placement of the soil?

17 A No. That is when we look at permeability for
18 liner purposes, that's a remolded permeability.

19 Q Okay. Did Biggs & Mathews analyze the TJFA
20 samples looking back -- sticking on Adams 5, you've got
21 TJFA samples' results reflected. Did Biggs & Mathews
22 analyze the TJFA samples sent to the lab?

23 A Yeah, there were samples provided to us, and we
24 did run analysis on those.

25 Q Were your results similar to those obtained by

1 TJFA?

2 A I don't remember those. I don't -- I really --
3 between the -- because I believe there were -- I believe
4 there were seven samples we had. I think it was seven.
5 My recollection is that some were similar, some weren't.

6 Q But you don't specific --

7 A I don't specifically remember the numbers.

8 Q Now, you said some weren't. Were there any
9 cases where they were significantly different?

10 A I don't remember those numbers today.

11 Q Okay. Do you remember if there were instances
12 where the results of your lab tests were significantly
13 different than the ones TJFA ran?

14 A We're looking at the samples that are on this?

15 Q Yeah, the samples on Adams -- that are shown on
16 Adams 5.

17 A No, I don't remember them enough to answer your
18 question.

19 Q Okay. Do you still have 336.3(e)(5) there --

20 A Yes.

21 Q -- available?

22 Looking at (5), does that begin -- and
23 these are basically -- what we're looking at here is
24 some of the required contents of your geotechnical
25 report. Is that accurate?

1 A What's the question?

2 Q That we're looking at (e)(5) in the context of
3 our larger regulation. And, essentially, (e) is titled
4 Geology Report. Is that correct?

5 A Yes.

6 Q So when we're looking at (e)(5), we're looking
7 at some of the type of information required to be
8 contained in the Geology Report?

9 A Yes.

10 Q And (e)(5) requires geotechnical data that
11 describes geotechnical properties of subsurface soil
12 materials and a discussion with conclusions about the
13 suitability of the soils and strata for the uses for
14 which they are intended.

15 Do you see that?

16 A No. Where are you reading -- which --

17 Q At the very beginning of 5. Let me just ask --

18 A Okay. I was on a different page.

19 Q So, essentially, this is asking for a
20 discussion of the suitability of the soils on-site for
21 the uses they're intended to be used for?

22 A Yes.

23 Q And so there is required to have a
24 discussion -- if you intend to use those soils, for fill
25 operations, you're required to discuss how suitable they

1 are for that?

2 A Yes.

3 Q And would part of that be a determination, if
4 you intend to use those soils for liner, a determination
5 of whether there is enough of those soils available for
6 those uses?

7 A No.

8 Q So is that why you did not perform a soil
9 balance?

10 A Yeah, I'm not required to perform a soil
11 balance.

12 Q As you interpreted this regulation?

13 A Yeah. I read no requirement to determine the
14 quantity.

15 Q You were asked on redirect certain questions
16 regarding the procedure you used for the preservation of
17 field samples. Is there an ASTM standard established
18 for the preservation of samples?

19 A I'm aware that there is at least one. There
20 may be more.

21 Q Did you adhere to that standard?

22 A I didn't check that standard, so if I did, it
23 would be by coincidence.

24 Q Have you compared the procedures you followed
25 to the procedures required by that ASTM standard?

1 A Not in a long time.

2 Q Okay. And do you have your preservation
3 procedures documented in any way?

4 A My preservation?

5 Q Do you have -- does your firm have standard
6 procedures for the preservation of samples?

7 A In a written form?

8 Q In written form.

9 A No.

10 Q Then how can one verify that you're following
11 your standard procedures?

12 A Because I'm the one who picked -- that's why I
13 went to the site to get the samples to look at them, and
14 then I checked the samples when they come out, so it was
15 my job to verify.

16 Q And so we simply have your statement that you
17 adhered to your standard procedures?

18 A Yes. I verify that I followed my procedures.

19 Q But without an identification of what those
20 procedures are?

21 A I'm sorry, I didn't hear the last part.

22 Q Without a particular identification of
23 specifically what those procedures are?

24 A Other than what I explained to Mr. Ryan.

25 Q Now -- and you discussed those procedures.

1 Does part of that procedure involve the sample sitting
2 in your office for a while? The procedure that you
3 used, were these samples in your office prior to being
4 tested at the lab?

5 A Some -- some were, some weren't.

6 Q And can that influence the outcome of the
7 results, the lab testing?

8 A If they sit in the office.

9 Q If they sit the time period from when they are
10 actually pulled out of the ground to when they are
11 tested?

12 A It depends on what type of test you're going to
13 run and how they are preserved.

14 Q But are there some parameters that it can
15 impact?

16 A For the parameters that we tested and the
17 period of time, no, it would not impact them.

18 Q Redirect began with some questions regarding
19 contaminated water management at the site. Are there
20 any specific management measures at the site that would
21 ensure contaminated water will not reach the stormwater
22 system during a 100-year flood?

23 A During the 100-year flood?

24 Q Yes.

25 A I don't believe the 100-year flood is

1 addressed.

2 Q It is not addressed in your contaminated water
3 management plan?

4 A No.

5 Q So you don't have any specific measures you can
6 point to that would prevent the movement of contaminated
7 water into the stormwater management system during a
8 100-year flood?

9 A No.

10 Q You were also asked questions regarding your
11 role in the design of the landfill footprint. Did you
12 say on redirect that you're the one who decided the
13 ultimate footprint of the landfill?

14 A Yes.

15 Q And that, I think, was through discussions with
16 what you said was the Applicant?

17 A With the Applicant and with information -- many
18 other pieces of information that would influence the
19 shape.

20 Q Who was the representative of the Applicant
21 that you discussed the shape of the landfill with?

22 A I would -- that information I would pass
23 through Mike Snyder, and then he coordinated with the
24 Applicant.

25 Q So did you have any direct discussions yourself

1 with representatives of the Applicant, or were all of
2 your discussions through Mr. Snyder?

3 A Mine would be through Mr. Snyder or through
4 forwarding drawings.

5 Q Do you know who with the Applicant Mr. Snyder
6 contacted to determine the proper shape of the landfill?

7 A No, I do not.

8 Q When we have a landfill -- would the shape of
9 this landfill require more seams than perhaps a more
10 rectangular landfill would require?

11 A More seams for what?

12 Q As we look at the construction process for the
13 base liner of the landfill, we -- does it include a
14 synthetic layer?

15 A Yes.

16 Q And is it necessary to have seams in that
17 layer?

18 A Yes. The geomembrane is seamed together.

19 Q And that's because you, of course, don't put an
20 entire liner -- just drop it in place all at one time;
21 it's put in place in essentially several pieces?

22 A It comes in large rolls.

23 Q That are then seamed together?

24 A Correct.

25 Q And if you have a landfill of a shape such as

1 this, does that require more seams in the construction
2 than, say, a normal rectangular landfill?

3 A Well, I wouldn't say a normal rectangular, but
4 a irregular shape would typically have more seams than a
5 rectangular shape.

6 Q And are seams a location where a leak is more
7 likely to occur than other areas of the landfill?

8 A I'm not prepared to say that.

9 Q So you don't have an opinion on that?

10 A Well, the seams are tested, and all the seams
11 go through destructive and nondestructive testing. And
12 so to say that they're more likely to leak at a seam,
13 I've seen no evidence that seams are more likely to
14 leak.

15 Q So do you have an opinion as to whether a leak
16 is more likely to occur at a seam versus other areas of
17 a landfill?

18 A No, I wouldn't speculate that.

19 MR. ALLMON: Your Honor, that's all of my
20 questions. I pass the witness.

21 JUDGE QUALTROUGH: Thank you.

22 Caldwell County?

23 MR. MAGEE: Thank you.

24

25

1 RE-CROSS-EXAMINATION

2 BY MR. MAGEE:

3 Q Mr. Adams, I think I can say I have a few
4 questions.5 Looking back to Adams 5, which was this
6 chart that we looked at, I just want to make sure I
7 understand it and what some of the testimony was
8 concerning that.

9 A Okay.

10 Q Okay. So I've sat through a whole bunch of
11 hearings. I don't have anything to do really with
12 sampling or who gets the samples and doesn't get the
13 samples, but I want to make sure I understand.14 The green triangles here are samples
15 that -- I guess it's my understanding there's two
16 different versions of samples for the green triangle,
17 and that is ones that the Protestants did, and then you
18 took those borings from the Protestants and had your own
19 lab samples done, too. Is that correct?20 A No. They did lab testing, and then a portion
21 of those they provided to us to do lab testing on some
22 part of that sample.23 Q Okay. And so then did they turn over the lab
24 results that they had to you?

25 A Well, not to me directly, but eventually I did

1 get them.

2 Q Okay. And is that what's reflected on your
3 exhibit, or is it the samples that you ran tests on
4 that's depicted on this exhibit?

5 A That would be when I put their -- yeah, that
6 would be their results.

7 Q Okay. And so then when you said you couldn't
8 remember the results that you received to compare them
9 to, that's not on here. Right?

10 A I would have to go back and check, because on
11 some of those in the 2016 -- I mean, I did have some
12 tests on a few -- on a limited number of theirs.

13 Q Okay.

14 A And so to be honest with you, I don't --

15 Q You don't know if that's on here or not?

16 A I don't recall if the red squares include my
17 test on their samples or not.

18 Q Okay. That's what my next question was going
19 to be was: Are the red squares the sampling and borings
20 that you went out there and did and then had samples
21 run, too; or does it also encompass samples that you had
22 run on borings that they did, and they shared the
23 samples with you? And that's what I think you said you
24 don't know. Right?

25 A That is what -- yeah, I would have to actually

1 go back to the Excel spreadsheet --

2 Q Okay.

3 A -- that would have that -- that this is
4 actually taken from.

5 Q I was just trying to make sure I understood
6 what each little symbol was from and where you got that
7 data for.

8 A Okay.

9 Q I don't want to jump around a whole bunch, but
10 I would like to go to the exhibit right before that,
11 Adams 4, Page 2.

12 A Okay.

13 Q And I think this is the exhibit that you
14 prepared and you directed someone, maybe Mr. Tucker, to
15 when you were answering some questions that were
16 followed up by Mr. Tucker -- right --

17 A Yes.

18 Q -- about the floodplain?

19 And we talked about the 25 -- the
20 hundred-year floodplain and then the FEMA Zone A
21 floodplain, and that's depicted on the legend. Right?

22 A Yes.

23 Q And he asked you a question about the distance
24 between the landfill footprint and these various
25 floodplains. Remember?

1 A Yes.

2 Q And you said you couldn't calculate that. So
3 is the scale that's above the legend, is that accurate
4 or inaccurate?

5 A I haven't checked that. I know on some of
6 these exhibits, drawings have been reduced. And so --
7 but what I was saying is, if you look at -- let me give
8 you an example. In Pond 3 --

9 Q Okay.

10 A -- in the southern part of Pond 3, it appears
11 that the toe of the fill, which is the dark green, comes
12 very nearly of touching the floodplain.

13 Q Right.

14 A Whether I've got a scale or not, I'm just not
15 capable of telling you how many feet that is.

16 Q Right. But I was just wondering -- I mean, if
17 that scale gave us like a sense of if it is -- you know,
18 I know the map's really small, but the scale says --
19 shows an indication for 600 feet and 300 feet, so we
20 certainly would be able to know it's under 300 feet.

21 A Oh, yes. Yes.

22 Q And it's probably even under, if we just do a
23 comparison here, under 50 feet or a hundred feet, you
24 know. I mean, I'm just trying to gauge if this scale is
25 correct --

1 A Oh, yeah, the scale -- the scale would be
2 correct. The scale would be correct, graphically.

3 Q Okay. So then we see that there's portions not
4 only of the FEMA Zone A floodplain and the hundred-year
5 floodplain that are very, very close to footprint of the
6 landfill. I'll let Mr. Ryan tell you what to say, but
7 go ahead.

8 A Could you ask your question again?

9 Q Sure. My question was: There are portions of
10 the FEMA floodplain in FEMA Zone A and the hundred-year
11 floodplain that if we look at your scale and look at the
12 dotted line and the solid line that are very close to
13 the perimeter here and these detention ponds --

14 A Well, they're -- I mean, they're closest to the
15 perimeter earth work.

16 Q Right. I mean, like you said --

17 A If you look at the green line, that's where we
18 would have earth work.

19 Q Okay. So like at number three, like you say,
20 it's almost touching the toe there. If you look at the
21 very bottom tip of the -- just the bottom southern tip
22 of it, you'll see the dotted line that goes across
23 there. If you follow it around Pond 2?

24 A Yeah, that's an interesting part. That line
25 actually crosses many feet of contour elevation.

1 Q I mean, I'm just saying if we're looking at the
2 line and comparison --

3 A Yeah, that would be --

4 Q -- it would be very, very close?

5 A Yes.

6 Q Right. Okay. That's all my question really
7 was on that.

8 If you'll just kind of leave -- well, if
9 you'll leave this map open for a minute, I want to move
10 to one other topic and then I'm done on that line of
11 question -- on all questions, I think.

12 If you'll turn to EP-4, and I'm
13 specifically talking about 176 that Mr. Ryan questioned
14 you about. You with me?

15 A On 176?

16 Q Yes.

17 A Yes.

18 Q This is the summary of the lab results, I'm
19 assuming, that we were going through when you and I were
20 talking about all those various boring logs, and there
21 was samples on that right-hand column?

22 A Yes.

23 Q Okay. And so Mr. Ryan asked you that there's
24 borings taken from each stratum. Correct?

25 A Yes.

1 Q Okay. So if we look at the very top first
2 three, those are the ones from Stratum I. Right?

3 A Yes.

4 Q And then the rest of that page is from Stratum
5 II?

6 A Yes.

7 Q And then if we turn to Page 177, that's Stratum
8 III?

9 A Yes.

10 Q Okay. Now what I'd like you to do is if you
11 would keep this spot right here and turn over to EP-4,
12 Page 47, and you can even pull it out just so it'll be
13 easier for you to look at. It's in that same book.

14 A Do I still need this?

15 Q Yeah, just leave that open right there.

16 A Okay.

17 Q Okay. So EP-4, 47, is the boring locations
18 that you and I talked about earlier. Right?

19 A Yes.

20 Q So, for example, if you would look on the
21 eastern edge of the landfill footprint that's proposed
22 here, you'll see it's kind of the bottom half. You'll
23 see Boring 17, 20, 21, 25, and 26. Do you see that,
24 kind of that whole area over there on the eastern
25 edge --

1 A Yes.

2 Q -- right?

3 Okay. So if you would look back at Page
4 176, was there any sampling in Stratum I, II, or III for
5 No. 17? And you'll have to go to Page 177 as well to
6 see Stratum III.

7 A No.

8 Q Okay. And then if we look at the next one that
9 I mentioned on Page 47, Boring 20, is there any sampling
10 in Stratum I, II, and III for Boring 20?

11 A No, I don't see any.

12 Q Okay. And if we'll look at the one just east
13 of there, Boring 21, is there any sampling in Stratum
14 I, II, and III for Boring 21?

15 A No.

16 Q And then the one just south of that one, Boring
17 25, is there any sampling in Stratum I, II, and III for
18 Boring 25?

19 A No, I don't see any.

20 Q And then just east of Boring 25 at Boring 26,
21 is there any sampling in Stratum I, II, and III for that
22 boring?

23 A No.

24 Q So that whole area, from 17, 20, 21, 25, and
25 26, according to 130EP-4, Page 176 and 177, didn't have

1 any samples. Correct?

2 A Those -- those that you just listed did not
3 have tests. They had samples; they did not have tests.

4 Q No tests done, right. In other words, you did
5 a boring, but there was no tests that are included in
6 here for that whole area?

7 A On those specific borings.

8 Q Okay. And then if you'll just look at that
9 area that I just described there on 17, 20, 21, 25, 26
10 on 130EP-4, Page 47, and compare that back to your map
11 in Adams 4, Page 2, we can just do a comparison. That's
12 around the area of Pond 2. Correct?

13 A Yeah, that would be on the same side of the
14 site.

15 Q At Pond 2. And then it follows the curve north
16 until it makes that sharp curve. Correct? That's the
17 only way I know how to describe it.

18 A Yes.

19 Q Like you're going to turn around to Pond 5 --
20 (Simultaneously speaking)

21 A You're going from northward, from Boring 26, to
22 17?

23 Q (BY MR. MAGEE) Right. Yes. So you're
24 curving -- if you're looking at your map on Pond 2 and
25 comparing it to Page 47, you're essentially going from

1 Pond 2 and curving all the way up around to close to
2 Pond 5, roughly, because that's Boring 17, 20, 21, 25,
3 and 26.

4 A Pond 5 would be adjacent to 13.

5 Q Okay. And then we can compare where the
6 floodplains are in relationship to all this --
7 correct -- on your Exhibit 2?

8 A Okay.

9 Q Correct?

10 A No.

11 Q I mean, we can see from your legend that the
12 floodplain is right there on that boundary of Pond 2.

13 A Yes.

14 Q Okay. Now, then, if you'll look back at EP-4,
15 47, and then look at Borings 15, 18, 22, and 23 -- you
16 follow me? It's the ones that kind of make that L shape
17 right there.

18 A Yes.

19 Q Okay. So if we look at EP-4, Page -- the
20 summary of the laboratory resorts -- results, Page 176
21 through 177, in Stratum I, II, and III, for Boring 15,
22 we'll see that there was one sample done, and that was
23 only in Stratum I for 15. Correct?

24 A Yes, that's correct.

25 Q And then if we look at Boring 18, we'll see

1 that there were no samples done -- I mean, no lab
2 samples done for Stratums I, II, and III?

3 A Yes, that would be correct.

4 Q Okay. And then if we look at 22, again, we
5 would see Boring 22 on the map, on Page 47; we would see
6 that there are no lab results in EP-4, 176 and 177, for
7 Stratum I, II, and III?

8 A Yes, that would be correct.

9 Q And then the same exercise for Boring 23?

10 A Yes, that would be correct.

11 Q And then that same exercise, looking at this L
12 shape right here, we could look back at your map and
13 Adams 4, Page 2, and see that this is the area around
14 Pond 3 where you describe the toe of the FEMA
15 floodplain. Right?

16 A That's pretty far from it. I mean, you say the
17 area, it's that -- it's that side.

18 Q It's that same corner that we're talking about?

19 A Yeah, it's that corner.

20 Q Okay.

21 MR. MAGEE: That's all the questions I
22 have.

23 JUDGE QUALTROUGH: All right. Thank you
24 very much.

25 MR. ALLMON: And, Your Honor, I do have

1 one thing that may be a housekeeping matter.

2 JUDGE QUALTROUGH: Okay.

3 MR. ALLMON: I would ask that the paper on
4 the board up there be marked as Exhibit P-41 and would
5 offer that.

6 MR. MAGEE: He just got one premarked as
7 41.

8 MR. ALLMON: Okay, P-42.

9 JUDGE QUALTROUGH: Okay. So the drawing
10 is going to be 42, Protestant 42?

11 (Exhibit Protestants No. 42 marked)

12 MR. ALLMON: Yes.

13 JUDGE QUALTROUGH: And can you reduce it,
14 get copies for everyone?

15 MR. ALLMON: Yes, we will reduce it.

16 JUDGE QUALTROUGH: All right. Any
17 objections to that coming in as a demonstrative aid?

18 MR. RYAN: No.

19 JUDGE QUALTROUGH: So 41 -- excuse me --
20 42 is admitted.

21 (Exhibit Protestants No. 42 admitted)

22 JUDGE QUALTROUGH: We're off the record.

23 (Discussion off the record)

24 JUDGE QUALTROUGH: All right. We are back
25 on the record.

1 You may call your next witness.

2 MR. RYAN: Thank you, Your Honor. We'll
3 call Martha O'Brien.

4 JUDGE QUALTROUGH: All right. I'll need
5 to swear you in. If you could raise your right hand.

6 (Witness sworn)

7 JUDGE QUALTROUGH: All right. Could you
8 please state your name for the record?

9 THE WITNESS: Martha O'Brien.

10 JUDGE QUALTROUGH: All right. You may
11 proceed.

12 MARTHA O'BRIEN,
13 having been first duly sworn, testified as follows:

14 DIRECT EXAMINATION

15 BY MR. RYAN:

16 Q Do you have in front of you what's been marked
17 as Exhibit O'Brien 1 in Volume 7 of Applicant's
18 exhibits?

19 A Yes, I do.

20 Q Are there any corrections that need to be
21 made --

22 A There are --

23 Q -- to that exhibit?

24 A -- a couple of questions on Page 5 of that
25 exhibit.

1 Q Okay. What are they?

2 A The first would be in Line 12, where it states
3 Exhibit 130EP-2, if that 2 could be changed to a 3.

4 Q Okay. Do you have a pen? Can you make that?

5 A I did.

6 Q Okay.

7 A And the next is in Line 13 and 14, at the end,
8 in parenthesis, Exhibit 130EP-2, again, if that could be
9 changed to 3.

10 Q Okay. And right there at the beginning of Line
11 13?

12 A Yeah, I'm sorry. At the beginning of Lines 13,
13 14, it says Part II, and if we could make that part
14 Roman Numeral III.

15 Q Did you make those changes on the exhibit?

16 A Yes.

17 Q And can you identify exhibit O'Brien 2?

18 A Yes. That would be a copy of my resume.

19 Q If you were asked here today, orally, each of
20 the questions set out in Exhibit O'Brien 1, would your
21 answers be the same as the answers set out in that
22 exhibit?

23 A Yes, they would.

24 MR. RYAN: Your Honor, I would offer
25 Exhibits O'Brien 1 and O'Brien 2.

1 JUDGE QUALTROUGH: Any objections?

2 MR. ROCKWELL: None.

3 JUDGE QUALTROUGH: All right. Those two
4 exhibits are admitted.

5 (Exhibit Applicant O'Brien Nos. 1 and 2
6 admitted)

7 MR. RYAN: I'll pass the witness.

8 JUDGE QUALTROUGH: Mr. Wilson, any
9 questions?

10 MR. WILSON: No questions, Your Honor.

11 JUDGE QUALTROUGH: Thank you.

12 The Executive Director?

13 MS. MURRAY: Yes.

14 CROSS-EXAMINATION

15 BY MS. MURRAY:

16 Q Good afternoon. I'm Kayla Murray representing
17 the ED, and I just have a few questions for you.

18 How many systems similar to this landfill
19 have you reviewed?

20 A Well, in my 30 years of conducting odor
21 assessments, some of them have been at this stage in
22 terms of, you know, a permit and something that is yet
23 to be built, but the majority of them have been already
24 existing landfills. And I would say between the two,
25 over the 30 years, I've conducted odor assessments for

1 well over 50 landfills.

2 Q Okay. What are the typical types of odors that
3 you would expect from this type of facility?

4 A Mainly in terms of the -- excuse me -- the
5 potential for off-site odor impact, there are really
6 three main sources that we would focus on. One would be
7 the potential for landfill gas, so it's important that
8 that's sufficiently collected.

9 The second would be odors from the
10 material itself, as it's deposited at the active face of
11 the landfill. And the third could potentially be, if it
12 wasn't collected and handled and enclosed in proper
13 ways, would be the leachate.

14 Q Did you go to this proposed site?

15 A Yes.

16 Q Okay. And based on your analysis of this site
17 and your personal experience, do you think that the
18 closest neighbors to this site will be impacted by
19 odors?

20 A I think if everything is as it's designed and
21 if it's operated with all of the provisions that are set
22 forth in the application, together with the other
23 related documents that I've reviewed in terms of wind
24 patterns and the topography and buffer zones and so
25 forth, I certainly think that nuisance level odors can

1 be prohibited.

2 Q Okay. And then just to follow up real quick on
3 the 50 or so landfills that you've reviewed over the
4 past 30 years, have you ever had to go back and make any
5 adjustments to your initial analysis?

6 A Not to my initial analysis, but I -- we've had
7 to go back and do further studies, test -- maybe they
8 had proposed to use different cover materials, so we
9 would go back later and make sure that any changes that
10 they've made or improvements that they've made, we'd
11 document the effects of that.

12 MS. MURRAY: All right. That's all the
13 questions I have. Pass the witness. Thank you.

14 JUDGE QUALTROUGH: All right. OPIC?

15 CROSS-EXAMINATION

16 BY MR. TUCKER:

17 Q Good afternoon, Ms. O'Brien. My name is Aaron
18 Tucker with the Office of Public Interest Counsel.
19 Thank you for being here.

20 A Sure.

21 Q I have a few questions. You were just
22 answering questions about if -- possibility of nuisance
23 odors on the closest residents. Were you here when
24 Mr. Worrall testified to the distance of the
25 residents -- of the nearest residents?

1 A No, but I did review the land analysis.

2 Q And what is your understanding of the distance?

3 A Approximately 345 feet away from the landfill
4 border, the border of the footprint of the landfill.

5 Q And you're comfortable with that distance,
6 with -- sorry. You're comfortable with the opinion that
7 residents at that distance will not experience nuisance
8 odors?

9 A Yes, especially with the buffer zone that
10 they're proposing to put in along the northern end of
11 the landfill.

12 Q Have you seen -- have you dealt with facilities
13 with a similar buffer zone that have had odor issues?

14 A I've dealt with facilities that have neighbors
15 as close as that that, you know, do not have
16 objectionable odor.

17 Q That do not?

18 A Yes.

19 Q Have you worked -- have you worked with
20 facilities that have residents at that distance that do
21 have an odor issue?

22 A Yes, in some cases even further than that if
23 they're not properly --

24 Q And what were the problems at those landfills
25 that led to the nuisance odors?

1 A Sometimes it was the types of waste that they
2 were accepting, the ways that they were handling them,
3 inappropriate cover, inappropriate method of deposit of
4 materials, things other than what I've read that have
5 already been addressed in the application here.

6 Q And it's correct you did not help prepare this
7 application; you just reviewed the application?

8 A Correct.

9 Q One of the things you mentioned -- you were
10 saying those problems that you identified from various
11 other landfills, you're saying that those are not
12 present at -- will not be present at this site?

13 A If designed and operated as set forth --

14 Q One of the --

15 A -- in the application.

16 Q -- things that you mentioned was cover. Do you
17 know if this site will use daily cover or alternate
18 daily cover?

19 A This is proposed to use the six inches of daily
20 cover.

21 Q Do you know if the SOP also includes
22 alternative daily cover as a possibility?

23 A I think it mentions an option if approved by
24 the regulatory agency.

25 Q Do you think there's a difference between daily

1 cover and alternative daily cover in terms of odor?

2 A Well, it depends on what the alternative would
3 be. In my experience on -- we've evaluated the
4 effectiveness of various types of cover. Some of them
5 are very adequate, some are not.

6 Q Can you tell me which ones would be adequate
7 and which ones are not, in your experience?

8 A Well, there's some of them that are sprayed-on
9 material. It's a mixture of like -- almost it'll
10 encrust the surface, and it's called -- the one that I'm
11 most familiar with is called Posi-Shell. And a landfill
12 in Massachusetts recently explored the potential use of
13 that, and as long as the odor of removal efficiency, the
14 odor suppression, was better than the soil, they were
15 allowed to use that for a period of time.

16 Q You're saying that that was an example of an
17 effective?

18 A Yes.

19 Q Okay. Can you tell me an example of an
20 ineffective alternative?

21 A Well, sometimes we've measured the odor
22 emission when they've wanted to use tarps at certain
23 landfills; and, again, depending upon the type of
24 material that they're collecting and compacting, it just
25 wasn't sufficient. Sometimes the landfills were taking

1 in highly odorous materials, such as sludges and things
2 like that which will not be permitted at this landfill,
3 and it was a different odor situation.

4 Q So are you saying that you don't believe tarps
5 are generally effective or they're ineffective in
6 certain circumstances?

7 A Certain circumstances.

8 Q And what factors lead to them being
9 ineffective -- tarps being ineffective cover?

10 A It really has to do with what materials they're
11 covering.

12 Q Does the climate have anything to do with it,
13 also?

14 MR. RYAN: Objection. Your Honor, this
15 application doesn't propose the use of any alternate
16 daily cover, so I'm going to object on relevance
17 grounds.

18 JUDGE QUALTROUGH: I believe the witness
19 testified that that was an option listed in the
20 application.

21 MR. RYAN: Well --

22 JUDGE QUALTROUGH: I'll let Mr. Tucker
23 respond.

24 MR. TUCKER: I'd point to the odor
25 management plan in Applicant's Exhibit 130EP-5, and if

1 you'll just give me a minute. Daily -- I'm looking at
2 Bullet Point 1, 2 --

3 MR. MAGEE: What page number are you on?

4 MR. TUCKER: Oh, I'm sorry, Page 143.

5 JUDGE QUALTROUGH: Of what exhibit?

6 MR. TUCKER: Applicant's Exhibit 130EP-5.

7 This is the site operating plan. And I'm --

8 JUDGE QUALTROUGH: I'm going to --

9 MR. TUCKER: Yeah, so look at Bullet
10 Point -- sorry -- 6, Daily cover consisting of a minimum
11 of six inches of soil or approved alternative daily
12 cover will be placed over these wastes at the end of the
13 working day.

14 And I'm just attempting to find out what
15 alternative daily covers.

16 MR. RYAN: Your Honor --

17 MR. ROCKWELL: On Page 148, Section
18 8.18.4, it says, Environmental Park plans to use
19 alternative daily cover material in the future.

20 MR. RYAN: And then it says, There are no
21 ADC materials included in the application. The operator
22 may propose ADC in the future. Before a specific ADC is
23 used at the site, the operator will seek authorization
24 from the TCEQ.

25 No alternative daily cover is being

1 proposed in this application.

2 JUDGE QUALTROUGH: Well, I'm going to
3 overrule your objection. Applicant's Exhibit 130EP-5,
4 Page 148, states that the -- you plan to use alternate
5 daily cover material in the future. I'm going to allow
6 this testimony. I know it hasn't been approved yet.

7 MR. RYAN: It hasn't even been requested.

8 JUDGE QUALTROUGH: I realize that, but the
9 statement there is a representation in the -- in the
10 application about future use of ADC. I'm going to
11 overrule your objection.

12 MR. TUCKER: Would you mind reading back
13 the last question?

14 JUDGE QUALTROUGH: Well, no. Just restate
15 it as best you can.

16 MR. TUCKER: Okay.

17 Q (BY MR. TUCKER) I believe the question was
18 what forms of alternative daily cover are ineffective.
19 Does that sound right? Is that the last question?

20 A Something like that, but I --

21 Q Okay. Would you mind answering that question?
22 Could you tell me what forms of alternative daily cover
23 are ineffective? No, I'm sorry. We had gotten past
24 that, and I was asking about -- we were talking about
25 the effectiveness of a tarp as a cover. And you were

1 talking about the factors --

2 JUDGE QUALTROUGH: You asked about
3 climate.

4 MR. TUCKER: Thank you.

5 Q (BY MR. TUCKER) Does the climate have anything
6 to do with how effective tarp is as an alternative daily
7 cover?

8 A No, not with the effectiveness of the tarp.
9 It's really site-specific and material-specific. And
10 typically in a case like this, you would want to test
11 another -- whatever you're proposing to use as an
12 alternative cover and test that its odor suppression is
13 at least equal to or better than what has already been
14 approved.

15 Q Can you tell me a little bit more about how
16 these assessments and tests are conducted?

17 A Well, it would be, in a very simplistic form,
18 going to the site, taking a odor emission samples, take
19 a covered flex chamber, cover a known area of the
20 surface that you're testing under the conditions that
21 you're testing, Cover A versus Cover B, and actually
22 quantify what the odor concentration is coming off of
23 that in terms of odor per unit time.

24 Q How do you quantify that?

25 A You quantify odor by using an odor panel. You

1 determine how many times does the odor that you've
2 collected in that sample, you collect them into a Tedlar
3 sampling bag. The way you quantify odor is you take
4 that odor sample, present it to a group of people that
5 have been previously screened and trained and make sure
6 they have adequate sensitivity. You present that sample
7 to them at various dilution levels, and ultimately you
8 determine how many times does that odor that you've
9 captured need to be diluted till it gets down to the
10 point where people can no longer detect it. So the
11 higher that number, the more concentration --
12 concentrated the odor was.

13 Q Is this method you just described the only way
14 to do an odor assessment?

15 A That's part -- you know, that's the odor
16 measurement portion of an odor assessment. That's an
17 ASTM method that -- that quantifies odor in terms of
18 dilutions to threshold.

19 Q Do you -- as part of your work, do you ever do
20 any offsite assessments?

21 A Yes, we also monitor offsite. We can measure
22 odors, you know, in the ambient conditions as well.

23 Q Can you tell me about those?

24 A Those you could collect -- if the odors that
25 you are monitoring were strong enough and consistent

1 enough, you could collect those into Tedlar bags and do
2 the same thing: Ship them to a lab where there's an
3 odor panel waiting and go through that procedure that I
4 described.

5 Or another alternative is to use a -- what
6 we call a portable olfactometer, which would be one
7 person using a device that -- again, it's a dilution
8 device, but it would determine -- you're in the odorous
9 plume, and you use this device either called a
10 scentometer or a nasal ranger, and it's doing the same
11 thing, although it's just one person at the other end,
12 but it is taking a series of dilutions and seeing how
13 much dilution it takes for the odor to become
14 undetectable.

15 Q And if you were able to obtain a -- I'm not
16 sure how you would characterize it, but a -- an odor
17 assessment offsite, that could be an indication of a
18 nuisance -- right -- if you had a positive test, or how
19 would you phrase it?

20 A No. If you were detecting odors offsite, you
21 would be able to, you know, measure what concentration
22 that odor was at. You could also measure what the
23 intensity of the odor is. Whether or not those were
24 attributable to a nuisance is not yet determined.

25 Q Okay.

1 A I mean, it takes -- you know, it takes a
2 certain intensity before it would become a typical
3 nuisance level.

4 Q What intensity do you believe it to be --

5 A Well, there's what's called -- it's another
6 ASTM method. It's -- it's called a butanol intensity
7 scale. And on an 8-point scale, anything that
8 approaches 3 or greater is generally considered to be a
9 public -- a nuisance.

10 In terms of odor concentration, there are
11 some states and regulations -- states and parts of the
12 U.S. that have quantitative odor regulations. They
13 would measure that based on odor concentration, and they
14 have a certain limit as far as beyond which it would
15 become a nuisance, below which it would be an acceptable
16 level of odor. So you could still smell things offsite,
17 but it takes a certain measurable amount typically
18 before it becomes a justified nuisance.

19 MR. TUCKER: Thank you. I have no further
20 questions.

21 JUDGE QUALTROUGH: All right. Who's going
22 next? Caldwell County or TJFA?

23 MR. ROCKWELL: Your Honor, I guess I'll go
24 forward.

25

CROSS-EXAMINATION

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BY MR. ROCKWELL:

Q Ms. O'Brien, my name is Brad Rockwell. I'm representing several of the Protestants, including members who live across the street from the landfill or very close to it. Where do you live?

A Connecticut.

Q And in Bloomfield?

A Yes. Well, that's where I work. I live in Suffield, Connecticut.

Q Okay. And does your opinion regarding odors at this facility take into account the recycling facility at the landfill site?

A Yes.

Q Does it take into account the transfer station?

A Yes.

Q And does it take into account the 40,000-pound compaction equipment?

A Yes.

Q And does it take into account the leachate storage facility?

A It does.

Q You gave your opinion that if everything is operated according to the terms of this permit -- and that was your predicate. Correct?

1 A Correct.

2 Q And in your experience, are landfills operated
3 precisely in accordance with their permits?

4 A Yes, they should be.

5 Q Well, are they?

6 A Yes.

7 Q That's your experience?

8 A Well, it's hard to tell in the permitting
9 stage. There's so much yet to come in terms of, you
10 know, when the gas collection system comes online and,
11 you know, as the site develops. But they have the
12 provisions in there, in my opinion, that are adequate
13 odor controls to prevent offsite nuisance.

14 Q And you've examined 50 different landfills.
15 Correct?

16 A At least, yes.

17 Q At least 50. Were all those landfills operated
18 as set forth in their permit?

19 A No. I'm sure some of them had permit
20 violations. That's probably why I was there, because
21 they were experiencing odor problems, so...

22 Q And sometimes redundancies need to be set up in
23 measures to be put in a permit under the assumption that
24 not every provision may be followed all the time. Is
25 that correct?

1 A Not necessarily.

2 Q So you said that if everything is followed
3 as -- in accordance with the permit, there would not be
4 nuisance level odors. Is that your opinion?

5 A Correct.

6 Q And you realize nuisance is a legal term.
7 Correct?

8 A Yes.

9 Q And it's not a scientific term but a legal
10 term. Is that correct?

11 A Yes.

12 Q Do you purport to have special expertise in the
13 field of Texas nuisance law either applicable through
14 TCEQ or other regulations or law applicable in Texas?

15 A Well, we've helped a lot of states try to
16 become more quantitative in their odor regulations
17 rather than the general nuisance law with, Thou shall
18 not create an objectionable odor, because that's very
19 hard to -- you know, for either end, for the source of
20 the odor to comply with or -- and for, you know, to hold
21 up in court on the other end as well.

22 So there are, like I said, a dozen or so
23 parts of the country that have quantifiable odor
24 regulations. So we use that as sort of a guidance to
25 what is the acceptable level of odor.

1 Q But it's not your -- you don't have -- you're
2 not testifying here today that Texas has a
3 all-encompassing nuisance standard that reduces nuisance
4 to a quantifiable number in terms of odor. Is that
5 correct?

6 A Correct.

7 Q Is it your opinion that the proposed landfill
8 will not produce airborne odors that would tend to
9 adversely affect human welfare or property?

10 A Yes.

11 Q That's your opinion?

12 A Yes.

13 Q Is it your opinion that the odors from the
14 proposed landfill will not interfere with neighbors'
15 normal use of their properties?

16 A Yes.

17 Q And what is your opinion based on? What is
18 that particular opinion based on?

19 A On my experience with other landfills and my
20 review of what is proposed in terms of odor controls at
21 this landfill and my review of other documents that have
22 described the, you know, the topography and the buffer
23 zones, my site visit to the landfill and the surrounding
24 area. Pretty much everything that I've -- I've reviewed
25 in relation to the application.

1 Q And would a strong odor that's coming in
2 through an open window at night that wakes someone up,
3 would that be an interference with a normal use of a
4 property, a residential property?

5 A Depends on what strong odor; but, yeah, it
6 depends on the -- not only the strength of the odor. It
7 depends on the frequency. It depends on the character.
8 All of those have to do with whether or not it would be
9 considered to be a nuisance.

10 Q Well, that wasn't -- I'm not asking a question
11 about nuisance; I'm asking whether it would interfere
12 with a neighbor's use of their properties if even one
13 night they were woken up with a objectionable -- by an
14 objectionable smell, no matter how strong or numerically
15 the smell was, if it woke them up in the middle of the
16 night, and it's coming from the landfill, does that
17 interfere with their normal use of their property?

18 A It's a personal judgment at that point without
19 taking into account those other aspects like I
20 mentioned: The frequency, the strength.

21 Q So you talked about a particular scale that --
22 is it an ASTM scale?

23 A Yes, it is.

24 Q And the intensity is 3 or more is -- you would
25 consider that a nuisance?

1 A Yes, on the 8-point scale, the butanol
2 intensity reference scale, it's an 8-point scale. And,
3 typically, we found in all different demographics,
4 different states across the country, internationally,
5 people are generally tolerant of some degree of odor.
6 But once it gets intense enough and is around frequently
7 enough, they will tend to complain about it. And what
8 that level is on the scale is a level about a 3. Even a
9 pleasant odor, so-called pleasant odor, if it's intense
10 enough and, like I said, around frequently enough,
11 they'll complain. And it's really the intensity at what
12 drives nuisance and complaints.

13 Q The human sense of smell is quite sensitive.
14 Correct?

15 A It is.

16 Q So your testimony, at least as set forth on
17 Exhibit 1, your prefiled testimony, is it that 130
18 Environmental Park's application follows the rules with
19 respect to odor control? Is that correct?

20 A Yes.

21 Q And you testified that you're familiar with the
22 applicable rules. Correct?

23 A Yes, those that are -- have anything to do with
24 odor.

25 Q And can -- but you don't identify any specific

1 of the rules in your testimony. Correct?

2 A No. I did it in a general sense.

3 Q What are the rules regarding odor that are
4 applicable here?

5 A Those that are listed in the 30 TAC, Chapter
6 330. I was interested in the general facility design,
7 300.63. I was interested in the odor management plan --
8 I mean 330.63 -- and the odor management plan, 330.149.
9 I was interested in the type of cover, 330.165(a). I
10 was interested in issues regarding control of -- and
11 elimination of any ponded water if it were to occur,
12 330.245(k). And I was interested in the buffer zones to
13 the nearest sensitive receptors, 330.543(b).

14 Q Anything else?

15 A No. Those are the regulatory rules I was
16 interested in. The other things would be, you know, the
17 types of material that were being accepted, specifically
18 the types that were being excluded: The landfill gas
19 management plan, the land use surrounding the area.
20 Those types of things that were important to me in terms
21 of the potential for ambient odor impacts beyond the
22 property line.

23 Q Is it accuracy -- is it accurate to say that
24 Part 3 of the application must include a site
25 development plan that, at a minimum, contains a design

1 for odor control measures for each storage separation
2 processing and disposal unit? And I'm quoting from
3 330.63, Subsection (b)(2)(C).

4 A Yeah -- no, I have it here but proposed
5 ventilation and -- yes, I did take that into
6 consideration, like for the transfer station and the
7 community drop-off? Is that what you meant?

8 Q Well, I was going to actually ask you that. In
9 terms of the term "unit" as used here --

10 A Uh-huh.

11 Q -- what's your understanding as to what the
12 various units were here in this particular landfill?
13 What are the units that are being referred to here?

14 A I interpreted that as being the -- the transfer
15 station, the community drop-off area, and that those
16 weren't really things that were applicable to forced
17 ventilation. They would be open air structures, covered
18 but not enclosed and ventilated.

19 Q Is it accurate to say that under these
20 regulations, the odor management measures mandated by
21 Section 330.63 must provide for the safeguarding of the
22 health, welfare, and property of the people who live
23 nearby?

24 A Yes.

25 Q And in your -- in your prefiled testimony,

1 you -- you've already testified a little bit about the
2 end of your prefiled testimony. You made some
3 corrections to a section where you identified the
4 specific provisions of the application that you relied
5 on for your opinion. Is that correct?

6 A Yes. Correct.

7 Q And is it accurate to say that you're relying
8 on exactly what has been set forth by the Applicant on
9 these particular pages?

10 A Yes. I think with those corrections, that is
11 complete.

12 Q Okay. And it appears you have some -- you
13 perhaps brought some documents up there with you. Did
14 you bring some?

15 A Yes.

16 Q And what are those documents?

17 A The one I read from was a printout of the rules
18 that I relied on, the relevant odor provisions in the
19 TCEQ.

20 Q And what are those other documents that you
21 brought with you?

22 A Some printouts of maps when I didn't -- I
23 didn't never look at the whole application; I only
24 looked at certain portions of it that were appropriate
25 for my expertise here, and it's the maps.

1 Q So it's section -- portions of those documents
2 you were just testifying about that you relied on that
3 were in the application?

4 A Yes.

5 Q Okay. So landfills often stink, don't they?

6 A Some do.

7 Q But as sort of the nature of the business?

8 A Well, considering what they're dealing with,
9 there are -- there are odors; but, you know, there
10 certainly are ways to manage them, and there's some
11 landfills that you would never know they were there,
12 driving by.

13 Q So you've done some work for Texas landfill
14 companies operating in or around Austin, Texas.
15 Correct?

16 A Yes, it was several years ago, but...

17 Q Several areas ago?

18 A Uh-huh.

19 Q Which landfills were those or which companies?

20 A I believe it was a Waste Management landfill.

21 Q Waste Management?

22 A Yes.

23 Q And that was in eastern Travis County?

24 A Yes.

25 Q And do you remember what years you worked for

1 them on that?

2 A That was probably ten or 15 years ago.

3 Q So somewhere between 2001 and 2006?

4 A Would be my guess.

5 Q And what was the occasion for you working with
6 them?

7 A I believe they had received some odor
8 complaints. And what we did for them was conduct a
9 base -- what we call a baseline odor survey which is,
10 you know, several days on-site, having a trained odor
11 scientist out actually patrolling the areas, accessible
12 areas, all around and seeing what the odor footprint, if
13 you will, is of that facility.

14 Or were there other odor sources that
15 might be being confused -- I think it was adjacent to
16 another closed landfill. So trying to sort out what the
17 odor impact was from that facility as well as other
18 things in the area that might be attributable to the
19 complaints.

20 Q So you said there were some odor complaints.
21 Correct?

22 A I believe -- I believe that's what initiated
23 our involvement, yes.

24 Q And were you aware that in -- in the year 2000
25 or October or December of 2001, there was an explosion

1 of odor complaints from that area of Austin?

2 A No.

3 Q Were you aware that people were smelling the
4 odor five miles away?

5 A I'm not aware of that specific time frame or
6 event, no.

7 Q Would that surprise you?

8 A It sounds like something that would have gotten
9 myself or somebody involved to figure out why.

10 Q And, in fact, you were brought in to figure out
11 what the problem might be?

12 A I don't know if it was that particular event,
13 but...

14 Q What do you remember hearing about the odor
15 complaints?

16 A I honestly don't remember the specifics about
17 that project.

18 Q Do you remember what your conclusions were?

19 A No, not -- not for that study.

20 Q And is all that you did was do some sort of
21 study?

22 A Yes.

23 Q And were you looking to try to figure out what
24 the source of the smell was?

25 A The extent and what the sources of odors were,

1 yes.

2 Q And it was a major problem. Correct?

3 A I don't recall it to be, so I'm not sure if it
4 was that event that you're discussing.

5 Q Have you done any follow-up with Waste
6 Management to see if that problem was addressed, the
7 odor problem?

8 A No.

9 Q Do you know whether they followed any advice
10 that you gave them?

11 A I don't think that was one that we gave them
12 advice. I think we just issued the report with the
13 findings that they were.

14 Q Okay.

15 A That's why I don't -- I don't think it was
16 that, you know, flurry of complaints that you were
17 talking about, because that would have driven us into
18 the landfill to help them solve the issues.

19 Q Are you aware that Waste Management attempted
20 to blame the smell on the next-door landfill, Republic
21 Sunset, it's called?

22 A No. I do recall the two landfills being
23 adjacent to each other; but, again, I'm not sure what
24 point in time we looked at that.

25 Q Would it surprise you that even as of 2008,

1 neighbors were complaining about the odor problems from
2 the Waste Management landfill and saying it interfered
3 with their use and enjoyment of their property?

4 A This is seven years later it's been going on?

5 Q Yes.

6 A Yes, that would surprise me.

7 Q So you testified a little bit about materials
8 in landfill being a potential source of odor. In terms
9 of this particular landfill, the 130 Environmental Park,
10 in terms of your knowledge of landfills, your knowledge
11 of the permit, what's allowed to be put in there,
12 what -- what materials are particularly likely or
13 potentially producing foul odors that would go into this
14 particular landfill?

15 A Just whatever is coming in in regular municipal
16 solid waste, which, you know, is a wide variety of
17 things but the point that it excludes things that we
18 know to be very problematic in some landfills. Like I
19 said, the sewage, municipal sewage. Sometimes municipal
20 sludges are landfilled, medical waste, slaughter house
21 waste. Those are the types of things that unless
22 they're handled in very, very specific fashion can be
23 the bad actors and cause the -- cause odor complaints at
24 landfills.

25 Q And were these materials used in the Waste

1 Management landfill?

2 A It could have been. I'm not sure.

3 Q So -- and, again, I wasn't -- my question
4 wasn't attempting to ask you what's not going in the
5 landfill --

6 A Uh-huh.

7 Q -- my question is asking you: Based on your
8 knowledge of landfills, the fact that landfills do
9 include materials that produce horrible odors --

10 A Uh-huh.

11 Q -- and what specific items could be expected to
12 be -- come into this landfill in the normal course of
13 business that would produce foul odors -- that are
14 capable of producing foul odors?

15 A Pretty much anything that's coming in as it
16 decomposes would be contributable in some fashion to a
17 level of odor that's generated.

18 Q So meat and food would be certain items.
19 Correct?

20 A Sure.

21 Q How about Sheetrock?

22 A Sheetrock could be an issue, yeah.

23 Q That can produce intense sulfur or rotten egg
24 smells. Is that right?

25 A Yes. If it came in in high quantities and in a

1 very moist environment, that could produce some odor.

2 Q What are some other items that would come in
3 that would produce --

4 A Any type of food waste, restaurant waste, yard
5 waste, you know, as it decomposes, if it's not covered.
6 And as long as it's covered, that would suppress the
7 odor generation; but as it composes, then it will start
8 to produce the gas, which, you know, is largely methane
9 and carbon dioxide, which are odorless, but it will also
10 contain trace amounts of chemicals that can be very
11 odorous.

12 So it's important that that gas, as it
13 develops, is collected and controlled. But everything
14 that's in that landfill is capable of decomposing and
15 causing some odor.

16 Q And what are some of the worst offenders, other
17 than the ones that this particular landfill is --

18 A I don't know. Up in Maine when they have the
19 lobster and fishermen trucks that come in, I mean, that
20 stuff is pretty odorous right away, so they've got to
21 dig a hole in the active face and cover it immediately.

22 Here in Austin, I think you just have a
23 mix of things, and whatever's designated to go to the
24 active face that day, it'll be compacted and covered at
25 the end of the day.

1 Q You mentioned methane gas?

2 A Yeah.

3 Q Is that something you looked at in the Waste
4 Management landfill?

5 A No.

6 Q Would it surprise you that an elementary school
7 across the street had to be evacuated because of methane
8 gas?

9 A Yes.

10 Q So when materials going into landfill are wet
11 or soaked in moisture, does this aggravate the odor?

12 A Yes, potentially.

13 Q Would the flooding of a landfill have an impact
14 on odor?

15 A Potentially.

16 Q Is it a good idea to build a landfill in a
17 floodplain for purposes of odor control?

18 A I guess I don't know the answer to that.

19 Q Could a flood disrupt odor control measures?

20 A I suppose it could.

21 Q Is your opinion on the adequacy of 130
22 Environmental Park's odor control program, or odor
23 management program, based on the assumption that the
24 landfill and its components are not located on a
25 100-year floodplain?

1 A No.

2 Q So you -- it's your opinion that no matter
3 whether it's in a floodplain or not, the odor management
4 plan takes care of it, the problems?

5 A Yes, based on what I've reviewed in the
6 application.

7 Q A necessary and key component of an odor
8 management plan is a plan for dealing with leachate.
9 Correct?

10 A Correct.

11 Q And to meet TCEQ rules, the Applicant's odor
12 management plan must adequately address it. Correct?

13 A Correct.

14 Q And can you explain what leachate is?

15 A Leachate is water that falls on top of the
16 landfill and comes in contact with the garbage down
17 below, percolates down through it, and ends up towards
18 the bottom of the landfill where it can be collected,
19 contaminated water, and it's been contaminated by the
20 waste that it's traveled through.

21 Q And leachate is addressed in the odor
22 management plan?

23 A Yes.

24 Q And the odor management plan is part of the
25 site operating plan?

1 A Yes.

2 Q And this site operating plan was sealed by
3 Mr. Maroney of Biggs & Mathews?

4 A Okay. I don't recall, but...

5 Q Can you look at -- if you know how to locate
6 the site operating plan, I'd ask you to look at it. I
7 can tell you it's on Page 130EP-5, Page 99.

8 MR. RYAN: It's Volume 4. It's actually
9 Volume 4.

10 A Okay. Could you say that one more time?

11 Q (BY MR. ROCKWELL) It's 130EP-5, on Page 99 is
12 when it -- where it starts.

13 A Okay.

14 Q You see that?

15 A Yes.

16 Q Do you see a seal on that page?

17 A Yes.

18 Q And the registered engineer is Mr. Maroney?

19 A Yes.

20 Q And this is Mr. Maroney's odor management plan.
21 Correct?

22 A Correct.

23 Q It's not yours?

24 A Correct.

25 Q And you're relying on his statements, data, and

1 representations?

2 A Correct.

3 Q He identifies as part of -- in the odor
4 management plan a truck wheel wash station. Do you
5 recall that?

6 A Yes.

7 Q And is it not true that a truck wheel wash
8 station is dependent on a supply of water?

9 A Yes.

10 Q And you don't have any independent knowledge
11 whether the Applicant has secured a water supply or
12 there's any other regulations that would interfere with
13 the operation of a truck wheel wash. Correct?

14 A Correct. I didn't really pay that much
15 attention to it as being a, you know, potential major
16 odor source as far as offsite impact. But I did read
17 about it, yes.

18 Q But that's an example that you're relying on --
19 on the plan here is something he put together. You
20 don't know whether his calculations are correct, or
21 there's other assumptions in there that may be wrong or
22 accurate. You're just assuming that everything in the
23 odor management plan is something that the Applicant can
24 do and that whatever formula and calculations are in
25 there are correct. Is that right?

1 A Yeah, I don't think there was too much of that,
2 but as I read the odor management plan, yes, this is
3 what I'm relying on, my opinion.

4 Q Now, on Page -- or on Paragraph 8.25.6 of the
5 odor management plan, which is --

6 A Leachate.

7 Q -- leachate. It's on Page 155.

8 A Yeah.

9 Q And he's done calculations on storage capacity
10 and design for a large storm event. Correct?

11 A Yes.

12 Q And concludes that this can hold the leachate
13 resulting from such a storm event. Correct?

14 A Correct.

15 Q And you haven't done any independent
16 calculations yourself?

17 A I have not.

18 Q You're relying on this?

19 A And the fact that it would be stored in covered
20 tanks, yeah.

21 Q And so if there's a problem with this design,
22 and leachate is not being taken from the site as
23 specified here, especially during large rainfall events,
24 then it's possible that your opinion as to compliance
25 with TCEQ regulations is incorrect. Right?

1 A It's possible, yes.

2 Q Now, your testimony also references Part 3D of
3 the application, which is found at 130EP-3, Pages 10
4 through 12.

5 A D3?

6 Q Yeah EP-3, Pages 10 through 12. That's partly
7 what you relied on?

8 A Okay.

9 Q And if you look at Pages 11 and 12, it refers
10 to the leachate storage facility. Do you see that?

11 A Uh-huh.

12 Q And the application authorizes the applicant to
13 transport leachate from the landfill to the storage
14 facility by means of a dual-contained leachate forced
15 main. Right?

16 A Yep.

17 Q What is that?

18 A Piping.

19 Q Pardon?

20 A Piping.

21 Q Okay. And your testimony is based on the
22 assumption that that can be done and that's feasible.
23 Correct?

24 A Yes. I assume that can be done and that's
25 feasible.

1 Q So can you turn to the same volume here,
2 130EP-3, Page 19, Exhibit D1.1. You see that?

3 A Yes, I do.

4 Q And do you see the location of the leachate
5 storage facility as identified there?

6 A Yes.

7 Q Do you know whether or not all or part of this
8 leachate storage facility is located within a
9 hundred-year floodplain?

10 A I don't know the answer to that.

11 Q Do you know whether a force -- leachate force
12 main would have to go through a floodplain in order to
13 reach that?

14 A Again, I don't know the answer to that.

15 Q And you're relying on Mr. Maroney for these
16 kind of details. Correct?

17 A If he's the one that's designing that system,
18 yes.

19 Q And the leachate facility is particularly
20 important and the storage in case of a large rain, like
21 a 50-year rain event or larger would be -- that's when
22 the leachate facility is most needed to collect that
23 kind of runoff and water. Correct?

24 A Yes. It's also at its most dilute form in that
25 situation as well, but yes.

1 Q Do you have any opinion as to whether this
2 leachate storage facility could function properly if it
3 were located within a floodplain?

4 A I assume it could.

5 Q But do you have personal knowledge of that or
6 expertise?

7 A No.

8 Q Do you know whether some part of the landfill
9 is located within a hundred-year floodplain?

10 A No. I didn't really analyze that as far as my
11 assessment.

12 Q Can odor emanate from a trash compactor?

13 A To some degree, some degree of odor could,
14 depending upon what's in it.

15 Q And are there circumstances where a trash --
16 the amount -- the intensity of odor from a trash
17 compactor can be quite large?

18 A I suppose it could, but the quantity of that
19 odorous air would be quite small.

20 Q Where does 130 Environmental Park's odor
21 management plan address the odor emanating from trash
22 compactors?

23 A I don't know if it does; but, again, that would
24 not be a major source of odor that I would be worried
25 about.

1 Q Do you know where the trash compactor is to be
2 located under the terms of this permit?

3 MR. RYAN: Objection. There's no trash
4 compactor proposed for this facility.

5 MR. ROCKWELL: We'll let the application
6 speak for itself.

7 MR. RYAN: Well, I'm objecting on the
8 grounds of relevance. He's asking about something that
9 doesn't exist.

10 JUDGE QUALTROUGH: Can you point to where
11 the application talks about the trash compactor?

12 MR. ROCKWELL: I'll go on with a
13 question --

14 JUDGE QUALTROUGH: Yeah, I'll sustain
15 that --

16 MR. ROCKWELL: -- but it is in there.

17 JUDGE QUALTROUGH: -- objection, then.

18 Q (BY MR. ROCKWELL) Did you consider the
19 transfer station when reviewing the adequacy of the 130
20 Environmental Park odor controls?

21 A Yes, I did.

22 Q And is a transfer station potentially the
23 source of odors?

24 A It is -- it could potentially be a source of
25 odor, yes.

1 Q And do you know where the transfer station is
2 supposed to be under the terms of the permit?

3 A Yes, I see the -- I see it located on the map.

4 Q Kind of on the western side --

5 A Correct.

6 Q -- kind of in the middle?

7 A Yeah.

8 Q How does the 130 Environmental Park odor
9 management plan address the odors specifically from the
10 transfer station?

11 A I think it's a relatively small source. And,
12 again, it doesn't require any ventilated odor control
13 system or anything like that.

14 Q Is this something that has an outdoor
15 component, or is it all indoors?

16 A I believe it's covered and with an open door.

17 Q So it's your opinion that transfer stations do
18 not need specific odor management plan provisions?

19 A No, not at that size at that location.

20 Q And what is the size?

21 A I don't know the exact size. I'm saying
22 looking at it from -- on the map and where it's located.

23 Q Is there any other part of this application
24 besides the drawings on this map that identifies the
25 size of the transfer station?

1 A Not that I noted.

2 Q Before reviewing the odor management plan here,
3 have you reviewed or studied any other odor management
4 plan for landfills in rural Texas?

5 A I probably have, but I can't tell you which
6 ones.

7 Q Are you aware of any problems in Caldwell
8 County with wild boars or pigs in rural areas?

9 A No.

10 Q Do you have any opinion as to whether wild
11 boars or any other feral animal could disrupt odor
12 control measures or increase the odor problems at a
13 landfill?

14 A No, I don't have any knowledge of that.

15 Q And that's not something you considered?

16 A No.

17 Q And so far as you can tell from Mr. Maroney's
18 odor management plan, he did not consider that, either?

19 A No, not unless it was lumped in with the
20 vectors.

21 Q Ms. O'Brien, is your opinion based on any part
22 on the land use compatibility study prepared by
23 Mr. Worrall?

24 A Yes, I did take that into consideration.

25 Q And in what way did Mr. Worrall's work affect

1 your opinion?

2 A Looking at specifically the one-mile radius
3 around the proposed landfill site, I -- you know, I
4 think over 90 percent of it, 93 percent of it, was open
5 space, pasture land, and some woods and that I'm under
6 the impression would remain undisturbed. There aren't
7 any, you know, very many sensitive receptors in the area
8 in terms of schools or day cares.

9 The dominant winds would be from the
10 south, southeast, blowing to the north most of the
11 time -- well, the majority of the time. Just looked
12 like it led me to believe and, in my opinion, to be that
13 it was a good land -- compatible land use where the
14 landfill was proposed -- is proposed to be.

15 Q Could you turn to -- this is part of the land
16 use study, and it's Page 152 of 130EP-1. It's a map
17 that's part of the land use analysis.

18 JUDGE QUALTROUGH: Let's go off the record
19 for a second.

20 (Discussion off the record)

21 JUDGE QUALTROUGH: All right. We're back
22 on the record.

23 JUDGE BELL: What page is that map?

24 MR. ROCKWELL: It's Page 152 of 130EP-1.

25 JUDGE BELL: Thank you.

1 Q (BY MR. ROCKWELL) It's in Volume 1.

2 A Part of the land use?

3 Q Yeah, Page 152.

4 A Got it. Got it.

5 Q Is that one of the items that you reviewed in
6 the course of coming up with your opinion?

7 A Yes, it is.

8 Q And on next -- on the next page, 153, is
9 another map showing purported growth trends. And that's
10 Page 153. Is that something you also reviewed?

11 A Yes.

12 Q So what was the significance of the -- of the
13 map or illustration on Page 153?

14 A That it wasn't a very populated area, a good
15 location. I mean, it's two miles north of the city to
16 the south. And, again, my trip out there, you know,
17 confirmed that.

18 Q And the name of this illustration is
19 Metropolitan Growth Trends?

20 A Yes.

21 Q Were growth trends an issue as far as
22 evaluating the impact of odor on the community?

23 A Yes.

24 Q In what way?

25 A Obviously encroachment upon the facility would

1 heighten the need for, you know, attendance to control.
2 But as it looked right now, this looks to be a very good
3 location.

4 Q And as you may notice on this -- on this
5 illustration, the growth trends end in the year 2010?

6 A Okay.

7 Q Are you aware of any other data on growth
8 trends after the year 2010?

9 A No. This is all I've seen.

10 Q Going back to the exhibit on Page 152, it's
11 your -- is it your understanding that the little yellow
12 squares represent single family residences?

13 A Yes.

14 Q And this is your understanding of where single
15 family residences are located near the landfill?

16 A Yes.

17 Q And in -- this assumption is based that
18 Mr. Worrall has done a thorough and accurate job in
19 preparing this document?

20 A Yes. And I did go out and drive through. I
21 didn't, you know, by any means locate everyone, but I
22 did drive through the clusters of residences within the
23 one mile radius.

24 Q Now, you mentioned a few minutes ago wind in
25 your testimony?

1 A Uh-huh.

2 Q And depending on wind conditions and the
3 strength of the odor, the wind can carry an odor from a
4 landfill for miles. Is that correct?

5 A I suppose, but miles -- I haven't experienced
6 that very often, only when there's been a very bad gas
7 collection system.

8 Q But it's mainly, would you say, a mile?

9 A No. Limited -- I would say normal operation of
10 a well-controlled, it's mainly the gas smell that's
11 going to go that far. And that would be like a half a
12 mile, if it wasn't being captured properly.

13 Q But it -- if something goes wrong, it could be
14 much further?

15 A Yes. I've gone to some landfills that don't
16 have gas control, active gas collection control, and
17 that is a situation where it can go very far under the
18 right conditions, but...

19 Q And you already testified, I believe, that this
20 site, the dominant winds were coming from the south?

21 A Generally in the southerly direction.

22 Q So --

23 A South, southeast.

24 Q -- all these houses immediately to the north of
25 the landfill would -- the wind would be carrying

1 whatever odor there was in their direction -- correct --
2 the dominant wind?

3 A With that wind direction, yes, odors would
4 travel downwind.

5 Q And I think you testified that at least one of
6 these landowners was something like 380 feet away from
7 the landfill footprint?

8 A Correct. That's what my recollection was.

9 Q So they would expect to -- any time the wind is
10 blowing from the south, they would certainly -- whatever
11 is at the landfill, they would get blown over towards
12 their house. Correct?

13 A Well, not necessarily. You know, the more wind
14 there is, the more dilution, the odor might not be
15 perceptible at that distance downwind. In addition,
16 they're talking about putting the berm on that northern
17 border, and as the wind travels that way, carrying the
18 odorous molecules with it, that's going to help disperse
19 the odors. Because it's going to be another thing that
20 this plume has to go up over, and the more disturbance,
21 the more dilution. So that's going to be a benefit.

22 It might -- if odors were still detectable
23 at that point when it hits the berm, it might go up and
24 over, get more dispersed, and then skip right over
25 and --

1 Q Ms. O'Brien, you don't live 380 feet away from
2 a landfill, do you?

3 A No.

4 Q In fact, where your office is in Bloomfield,
5 Connecticut, there's -- the landfill is closed in that
6 community. Correct? It's just a transfer station?

7 A I don't even -- no, there's one in Hartford
8 that is --

9 Q But in your community, the landfill closed?

10 A Uh-huh.

11 Q And are you aware where your waste goes?

12 A In Bloomfield?

13 Q Yes.

14 A Yeah, to the town. It does have a landfill.

15 Q You're testifying that Bloomfield has an
16 operating landfill?

17 A No. I think it goes to Hartford, actually.

18 Q It goes to Hartford --

19 A Yeah.

20 Q -- and is incinerated. Correct?

21 A Yes.

22 Q And some of it's been shipped by rail to Ohio?

23 A Could be. I pay more attention to my own trash
24 in Suffield, and we do have a landfill.

25 Q But you don't have one next to your house?

1 A No, but in my town.

2 Q Yeah.

3 MR. ROCKWELL: Pass the witness.

4 JUDGE QUALTROUGH: All right. Caldwell
5 County?

6 CROSS-EXAMINATION

7 BY MR. MAGEE:

8 Q Ms. O'Brien, my name is Eric Magee. I
9 represent the County in this matter. I just had a few
10 questions for you.

11 I believe just a few maybe four or five
12 questions ago, you were talking about the berm on that
13 north side. How tall is the berm?

14 A I don't know. It could be up to a 50-foot
15 elevation, might be something lower than that. But on
16 top of that, I'm under the impression that there will be
17 mature trees planted.

18 Q And that's what you were referring to as
19 "screening" earlier. Right?

20 A Yes, I think it -- yeah.

21 Q And on top of that berm with the trees, how
22 tall do you think these mature trees are?

23 A It might be another 50 feet.

24 Q I'm not --

25 A I'm guessing. I'm guessing.

1 Q I'm not asking for an exact number; I'm just
2 trying to get -- so roughly a hundred feet or taller,
3 right there. Right?

4 A Uh-huh.

5 Q And will these mature trees already be planted
6 after the berm is, or are these trees that will have to
7 grow to that height?

8 A That, I don't know, but the idea is in addition
9 to a visual enhancement on the northern end, it will
10 also be beneficial for any potential odors to be further
11 dispersed.

12 Q And then do you know how tall the landfill will
13 reach?

14 A At its final height?

15 Q Yes.

16 A No. I thought --

17 Q Taller than that. Right?

18 A I'm not sure.

19 Q Okay. So that's not something you looked at in
20 comparison to the height of the overall landfill and
21 then whatever the berm and screening trees would be.
22 Correct?

23 A Correct.

24 Q And you also don't know whether these trees
25 will be fully mature upon planting or whether these are

1 trees that were expecting to grow there to help with
2 this nuisance odor -- I don't know what word to use --
3 aversion or whatever. Correct?

4 A No, I didn't look at the --

5 Q Okay. One of the other things I wanted to ask
6 you about was in your prefiled testimony, O'Brien 1,
7 Page 3, I'll give you a few minutes to get there. And
8 just while you're organizing the books over there, if
9 you'd keep Volume 1 handy, also.

10 A Okay. Ready.

11 Q The first question I have doesn't have anything
12 to do with Volume 1. It's actually at Page 2, Line
13 13 -- well, actually, 14. It's asking about where
14 you've done odor measurement identification. That's at
15 Line 10. And then Line 13 your answer was, Yes, I
16 provided odor consulting services for many municipal
17 waste landfill clients. I've done so recently for
18 landfill sites in Dallas, Houston, Austin, Texas.

19 Did I read that correct? I know --

20 A Yes.

21 Q -- the sentence goes on, but --

22 A Yes. Yes.

23 Q And when Mr. Rockwell was asking you questions
24 about the one in Austin, Texas, and you say, "recently
25 in Austin," you're referring to that one you did ten or

1 15 years ago?

2 A Yeah.

3 Q Okay. I just wanted to make sure.

4 A Correct. And the Dallas one was some time ago,
5 too.

6 Q Okay. But there's no other work you've done in
7 Austin within that ten or 15 years that you can think of
8 on a landfill case?

9 A No. I've done some transfer stations and some
10 other things, but I can't think of another landfill
11 other than the one I referenced.

12 Q Do you know if that landfill is still
13 operational?

14 A Honestly, I don't.

15 Q Okay. And then in that same exhibit, Page 4 of
16 your prefiled testimony, Line 18, the question was: In
17 your opinion, will 130 Environmental Park landfill
18 facility, developed and operated as described in the
19 application, control odors so the nuisance conditions
20 from odors will not be released from the facility
21 boundary?

22 And then your answer, at 22, was yes.

23 Did I read that correctly?

24 A Yes.

25 Q Okay. And then in Volume 1, I believe

1 Mr. Rockwell was asking you about EP-1, Page 152. And I
2 believe this is a document you said you reviewed from
3 Mr. Worrall's land use analysis. And the facility
4 boundary you're referring to is this same thing in your
5 testimony here, that the nuisance conditions from odors
6 would not be released past the facility boundary, that's
7 the one that's in the dark, checked line. Correct?

8 A Correct.

9 Q And then when you said you drove around, it's
10 all these residences and commercial building -- or
11 businesses that will not be affected within this one
12 mile radius. That's what your testimony is?

13 A Right.

14 Q Okay.

15 A For nuisance level -- nuisance level odors.

16 Q And so if you would turn in that same notebook
17 to Page 123 -- Volume 1, Page 123. So in this document,
18 we see that the facility boundary is a yellow line and
19 then two dots. Do you see that over in the legend?

20 A Uh-huh.

21 Q And then we see a solid yellow line that
22 encircles basically the facility boundary. Do you see
23 that?

24 A Yes.

25 Q And it's just -- on the north side of that, it

1 says the 500-foot radius?

2 A Yes, I see that.

3 Q Okay. And then the little boxes that are
4 indicated within the 500-foot radius are -- it's
5 described in the legends as structures and inhabitable
6 buildings within 500 feet. Do you see that?

7 A Yes, I do.

8 Q So it's possible those -- I think there's eight
9 of those within 500 feet of the facility boundary.

10 A Okay, within 500 feet?

11 Q Yes. You see those?

12 A Yes, I do.

13 Q Some of those may be residences. Correct?

14 A Could be.

15 Q And based on the height and any berms and
16 screening that may be at this landfill, according to the
17 designs you've reviewed, it's still your testimony that
18 you don't believe that nuisance conditions from odors
19 will be released past the facility boundary and onto
20 even these eight structures?

21 A That's true.

22 Q Okay. But you haven't reviewed the actual
23 height of the overall landfill in comparison to the berm
24 and maturity of the screening trees. Correct?

25 A Right.

1 MR. MAGEE: Okay. No further questions.

2 JUDGE QUALTROUGH: All right. Any
3 redirect?

4 MR. RYAN: Yes, ma'am.

5 JUDGE QUALTROUGH: How much?

6 MR. RYAN: Probably five minutes.

7 JUDGE QUALTROUGH: Okay. Shall we finish
8 this witness today?

9 MR. RYAN: I'd sure like to.

10 JUDGE QUALTROUGH: Any objections to that
11 from the other parties? All right. And you're okay?

12 THE REPORTER: Yes.

13 REDIRECT EXAMINATION

14 BY MR. RYAN:

15 Q First of all, based on your experience, what is
16 the height of an earthen berm that is necessary to
17 provide significant mixing to dilute odors like you
18 talked about?

19 A It's just really an added benefit in a buffer
20 up in that area that I found to be beneficial, and I
21 have seen it to be effective at other landfills. As I
22 said, any time the odor has to go -- the odor's plume or
23 the air has to go up and around and over things is
24 better for the dispersion of odors.

25 There isn't a steadfast rule as far as

1 what height. I thought 50 feet would be significant and
2 beneficial. There's also a little bit of adsorption.
3 If there's -- the odorous compounds in the air, as they
4 go, they will cling to and deposit out on the deciduous
5 leaves and so forth.

6 Q Would an earthen berm, a vegetated earthen berm
7 of, say, 15 or 20 feet, would that provide the kind of
8 mixing you're talking about?

9 A It would provide some. It's very hard to
10 quantify, but it would be of benefit, yes.

11 Q Okay. I'd like you to take a look in Volume 6,
12 Exhibit Worrall 3, Page 8.

13 A I see that.

14 Q Did you have this version of a land use map
15 with you when you made your site visit?

16 A Yes. I had the most updated.

17 MR. RYAN: I'll pass the witness.

18 JUDGE QUALTROUGH: Mr. Wilson?

19 MR. WILSON: No questions.

20 JUDGE QUALTROUGH: All right. Executive
21 Director?

22 MS. MURRAY: No questions.

23 JUDGE QUALTROUGH: OPIC?

24 MR. TUCKER: Just one question.

25

1 RE CROSS - EXAMINATION

2 BY MR. TUCKER:

3 Q Is a berm less effective the shorter it is, in
4 terms of odor control?5 A Again, it's hard to quantify, but if there was
6 a structure there in terms of, you know, solid fence or
7 a berm with trees on it, vegetation, anything like that,
8 it is somewhat beneficial.9 Q But would you -- would you say that a berm
10 that's 15 to 20 feet is less effective at odor control
11 than one that's 50 feet tall?12 A I don't really have data that would support
13 that, other than my experience where berms have been
14 effective in not only diluting but diverting the path of
15 odors.

16 MR. TUCKER: Okay. Thank you.

17 JUDGE QUALTROUGH: All right. TJFA?

18 MR. ROCKWELL: No questions.

19 JUDGE QUALTROUGH: No questions?
20 Caldwell County?

21 RE CROSS - EXAMINATION

22 BY MR. MAGEE:

23 Q And just back to Mr. Ryan's point about the
24 earthen berm, if the open face working space of the
25 landfill, where they're accepting trash and disposing of

1 it, is higher than the earthen berm or the screening,
2 you would agree with me that the odorous plume is not
3 traveling over any of those things. Correct?

4 A That's true. And I believe the -- you know,
5 that would be at the end in terms of their starting from
6 a southern portion --

7 Q Right.

8 A -- moving up.

9 Q I just -- I mean --

10 A And if it ever got higher than that, the berm
11 is not effective, correct.

12 Q Okay.

13 MR. MAGEE: Thank you very much. No
14 further questions.

15 JUDGE QUALTROUGH: All right, then. Thank
16 you very much. You're free to go.

17 And we'll start again tomorrow morning.
18 All right. We're off the record.

19 (Proceedings recessed at 5:19 p.m.)
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C E R T I F I C A T E

STATE OF TEXAS)
COUNTY OF TRAVIS)

We, Dalia F. Inman and Lorrie A. Schnoor,
Certified Shorthand Reporters in and for the State of
Texas, do hereby certify that the above-mentioned matter
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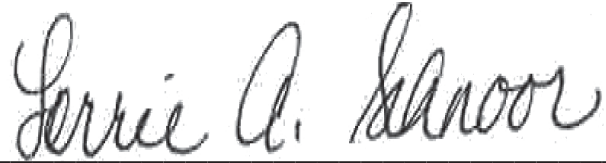
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IN WITNESS WHEREOF, we have hereunto set our
hand and seal this 1st day of September 2016.

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