1 REPORTER'S RECORD
VOLUME 1 OF 1 VOLUME
2 TRIAL COURT CAUSE NO. 2011-76724

3

4 HARRIS COUNTY, TEXAS, * IN THE DISTRICT COURT OF
Plaintiff, and THE STATE OF *
5 TEXAS, acting by and through *
The TEXAS COMMISSION ON *
6 ENVIRONMENTAL QUALITY, *a* *
Necessary and indispensable *
7 *Party* *
*
8 v. * HARRIS COUNTY, T E X A S
*
9 INTERNATIONAL PAPER COMPANY, *
McGinnis INDUSTRIAL *
10 MAINTENANCE CORPORATION, *
WASTE MANAGEMENT, INC., AND *
11 WASTE MANAGEMENT OF TEXAS, *
INC., *Defendants*. * 295TH JUDICIAL DISTRICT
12

13
REPORTER'S RECORD
14
DAILY COPY
15
OCTOBER 17, 2014
16

17

18 On the 17th day of October, 2014, the trial came on
to be heard in the above-entitled and -numbered cause;
19 and the following proceedings were had before the
Honorable Caroline Baker, Judge Presiding, held in
20 Houston, Harris County, Texas:

21 Proceedings reported by computerized stenotype
machine; Reporter's Record produced by computer-assisted
22 transcription.

23

24

25

1 A P P E A R A N C E S:

2

3 COUNSEL FOR THE PLAINTIFF, HARRIS COUNTY:

4 CONNELLY BAKER WOTRING, LLP
5 700 JPMORGAN CHASE TOWER
600 TRAVIS STREET
6 HOUSTON, TEXAS 77002
PHONE: 713.980.1713

7 BY: MR. EARNEST W. WOTRING
8 MS. DEBRA TSUCHIYAMA BAKER
MR. DAVID GEORGE
9 MR. JOHN MUIR

10 - AND -

11 THE OFFICE OF VINCE RYAN
COUNTY ATTORNEY
12 1019 CONGRESS, 15TH FLOOR
HOUSTON, TEXAS 77002
13 PHONE: 713.755.7880

14 BY: MR. ROCK OWENS
FIRST ASSISTANT COUNTY ATTORNEY

15

16

17 COUNSEL FOR THE PLAINTIFF, THE STATE OF TEXAS:

18 OFFICE OF THE ATTORNEY GENERAL OF TEXAS
ENVIRONMENTAL PROTECTION DIVISION
19 P.O. BOX 12548, CAPITOL STATION
AUSTIN, TEXAS 78711-2548
20 PHONE: 512-463.2012

21 BY: MR. ANTHONY W. BENEDICT
ASSISTANT ATTORNEY GENERAL

22

23

24

25

1 A P P E A R A N C E S:

2

3

4 COUNSEL FOR THE DEFENDANT, WASTE MANAGEMENT, INC.
AND WASTE MANAGEMENT OF TEXAS, INC.:

5

GIBBS & BRUNS, LLP
6 1100 LOUISIANA, SUITE 5300
HOUSTON, TEXAS 77002
7 PHONE: 713.650.8805

8 BY: MR. BARRETT H. REASONER
MR. ROBIN GIBBS
9 MR. MARK GIUGLIANO
MR. ANTHONY KAIM
10 MS. SYDNEY BALLESTEROS
MR. COLIN POGGE
11 MR. BRIAN T. ROSS

12

13

14 COUNSEL FOR THE DEFENDANT, INTERNATIONAL PAPER COMPANY:

15 MORGAN, LEWIS & BOCKIUS, LLP
1000 LOUISIANA STREET, SUITE 4000
16 HOUSTON, TEXAS 77002
PHONE: 713.890.5000

17

BY: MR. WINN CARTER
18 MR. CRAIG A. STANFIELD
MR. CHRIS AMANDES
19 MR. DAVID SCHRADER

20 - AND -

21 GIBSON, DUNN & CRUTCHER, LLP
1050 CONNECTICUT AVENUE, N.W.
22 WASHINGTON, D.C. 20036-5306
PHONE: 202.955.8500

23

BY: MR. DANIEL W. NELSON

24

25

1 A P P E A R A N C E S:

2

3

4 COUNSEL FOR DEFENDANT,
MCGINNIS INDUSTRIAL MAINTENANCE CORP.:

5

6 WINSTON & STRAWN, LLP
1111 LOUISIANA STREET, 25TH FLOOR
HOUSTON, TEXAS 77002-5242
7 PHONE: 713.651.2663

8 BY: MS. PAULA W. HINTON
MS. MELANIE GRAY

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

1 OCTOBER 17th, 2014
2
3 THE COURT: We're going on the record.
4 Mr. Wotring.
5 MR. WOTRING: The first issue that Harris
6 County would like to raise has to do with the use of
7 Defendants' Exhibit 8, and that's the e-mail chain from
8 Marshall Cedilote, C-e-d-i-l-o-t-e. The transcript will
9 reflect what was exactly said, but my memory is that
10 counsel for the defendant, Waste Management, invited the
11 jury to compare the State's response to that letter with
12 their conduct in determining a penalty amount. And the
13 response to that letter is contained in a document that
14 the TCEQ produced in this matter. State underscore --
15 MR. BENEDICT: Earnest, if I may interject?
16 That one may be missing a page. I have a better
17 citation. It's State_A0309862 through 0311299.
18 Now, its a five-volume document. There may
19 be parts of it that don't need to come in.
20 MR. WOTRING: So we're giving everybody
21 advanced notice that we're going to be moving to
22 supplement our exhibit list for the introduction of that
23 report. And that report is extensive and we think it's
24 required now, as a result of arguments made in opening.
25 THE COURT: What is that document?

1 MR. BENEDICT: It is the site screening
2 investigation. It specifically refers to the Parks &
3 Wildlife referral to TCEQ in 2005. And at the request
4 of EPA, the TCEQ conducted a site screening
5 investigation of the San Jacinto River Waste Pits,
6 reviewing the sampling history and then reported back to
7 the EPA in September 2006.
8 MS. BAKER: I believe we talked about it
9 before, also. It has the signature of people that did
10 testing. We talked about why the defendants thought the
11 UAO wasn't authenticated. It's based on the testing
12 thing done by the TCEQ, and we wanted to use that
13 document.
14 MR. BENNETT: I was just going to add, I
15 missed the first part; I was pulling up the document for
16 somebody to look at. It's not only Mr. Cedilote, the
17 comments about the title, but there was a statement, I
18 believe made yesterday, that after the 2005 Parks &
19 Wildlife letter the TCEQ did nothing for three years.
20 THE COURT: That was the statement, as I
21 recall.
22 MR. BENNETT: And this is clearly
23 responsive to that.
24 THE COURT: All right.
25 MR. REASONER: And we'll -- obviously, we

1 don't have the five volumes here. We'll look at them
2 and I'll predict we'll have some objections to some of
3 that, but we'll look at it.
4 MR. WOTRING: So we're raising that issue
5 now for the Court's attention. It's not going to come
6 up this morning or perhaps today.
7 THE COURT: Okay.
8 MR. WOTRING: That is one issue. Then we
9 had a couple other issues with regard to opening
10 arguments and some of the Court's rulings on the motion
11 in limine, as well.
12 MS. BAKER: Yes, Your Honor. The first one
13 is, yesterday we believe the door was opened on the
14 black liquor documents. Counsel for Waste Management
15 told the jury the County has no evidence about harmful
16 waste, toxins, or even waste being released. Of course,
17 we do; but it got excluded. So we think it is -- we
18 would like the Court to reconsider letting us use
19 Exhibit 135. Having told the jury that we have no
20 evidence of anything being released or hazardous,
21 harmful waste, and excluding them, they can't now turn
22 around and tell the jury, "Well, they don't have any
23 evidence of harmful waste or anything getting out." We
24 think that's prejudicial.
25 MR. REASONER: I'm not sure what argument

1 is being referred to there, if you were talking about
2 me, counsel for Waste Management; but we can go back to
3 the transcript. We're talking about Bedient and
4 Pardue's testimony about a specific means of release on
5 a given day, amount of release on a given day.
6 THE COURT: What you said about Dr. Bedient
7 and Dr. Pardue was that they had the absolute -- they
8 were absolutely imprecise in how the dioxin got out on
9 any given day --
10 MR. REASONER: Correct. We're talking
11 about the daily release.
12 THE COURT: -- which is consistent with
13 what's been argued before.
14 MS. BAKER: We're arguing on Page 135. It
15 says "What is the evidence the County is relying on?
16 What they do not say is anything about dioxin, anything
17 about harmful waste or toxins or waste even being from a
18 paper mill or waste being released."
19 So I guess our point is, telling the jury,
20 you know, the County doesn't have any evidence to rely
21 on harmful waste, having kept them out, you can't
22 hamstring someone by saying, "Now that we have kept it
23 out, I'm going to tell the jury they don't have any
24 evidence," because we do.
25 MR. REASONER: Sorry. As what counsel --

1 when we looked at it and recalled, what I'm saying is
2 what the documents show, the two documents that are
3 supposed to put Waste Management on notice. I had said
4 neither of those documents -- that's the 1992 --
5 THE COURT: Yes. You are saying what that
6 document does not say.
7 MR. REASONER: Of course.
8 THE COURT: I do remember that, because you
9 said what is the -- let's look at what the County says.
10 "What is the evidence that the County is relying on?
11 You saw the two documents in opposing counsel's opening
12 argument," and then you go through what these two
13 documents say or don't say.
14 I don't think referring to what the
15 documents say or don't say opens the door.
16 MS. BAKER: Just as a last final comment --
17 I understand what you said -- I think the overarching
18 issue is when you exclude the evidence and then turn
19 around and say, "Well, these two documents don't mention
20 it," there are documents that do mention it. I feel
21 like that is giving the jury the wrong impression. So I
22 would like to, as we go forward, have an eye toward that
23 type of thing. That seems unfair.
24 THE COURT: I do understand if you are
25 going to raise an issue with regard to them referencing

1 things that have been kept out. This is specifically
2 referring to what Waste Management should have known
3 from the documents that they got when they got MIMC; and
4 so I don't think that's the same issue.
5 I am sensitive to the point you are
6 bringing up. And I think one of the things that would
7 be helpful -- because I thought about this, as well, in
8 terms of the time frame because, obviously, in all
9 fairness to the County, the time frame starts at '73
10 because of the rulings of the Court. And while it's
11 okay for you-all to say that's however many years after
12 things were put into the pits, I think just be sensitive
13 to the fact of talking about they don't have any
14 evidence from 1973 on, and not reference the in-between
15 time period, other than the fact that it's seven,
16 nine years, whatever, after the pits. I think that will
17 take care of that issue because, again, that's not your
18 position. That's based on rulings I needed to make from
19 an evidentiary standpoint. So I think as long as
20 everybody is sensitive to that and focuses on that, that
21 should take care of any potential problems there.
22 MR. SCHRADER: Your Honor, I need some
23 clarification, I guess, because we're in trial now and
24 the trial is going to be about admissible evidence. I
25 hope we're able to argue that there has been no evidence

1 presented in this case on various issues, and that
2 doesn't somehow open the door to evidence that's been
3 excluded from the case.
4 THE COURT: I don't think it does in
5 general; but because the case is based on the Court's
6 rulings, it's going to be presented in the Charge as
7 starting in '73. I think the important thing is to
8 focus on the penalty period.
9 MR. SCHRADER: I understand that but --
10 THE COURT: And the penalty period is based
11 on the Court's rulings, starting in '73. And I think
12 that if we're clear about that when we're talking about
13 the penalty period, I don't think that's a problem.
14 MR. WOTRING: And the argument is it's
15 unduly prejudicial, unfairly prejudicial, in comparison
16 to its probative value under Rule 403, then, yeah, I
17 think they very much switched the scales on how that's
18 weighed, depending on the arguments they make.
19 THE COURT: That can happen, and that's why
20 I take notes and I'm looking at the transcript. I think
21 it's a twofold issue once they're rulings of the Court.
22 There is the prejudice issue. There is also relevance,
23 because if I've made rulings, there are certain things
24 that are no longer relevant. So I get both sides' view
25 on that. I'm sensitive to it because, again, you-all

1 are following the rulings of the Court, whether you
2 agree with them or not, and you shouldn't be hamstrung
3 in certain situations. And so I hear where you're
4 coming from on that and so I think the way to address
5 that, for purposes of the record, is like I said, I
6 don't have a problem with showing the time after the
7 pits are closed. That's just a fact, but also be clear
8 that you are talking about the penalty period.
9 And that may be helpful with our expert, as
10 well, because obviously he has opinions from before then
11 and so we need to focus in on the opinions that are
12 relevant to this trial.
13 MR. SCHRADER: Understood. I'll offer up
14 another example. There is not going to be evidence
15 presented by the County as to the amount of dioxin
16 released from the impoundment. I hope we're able to say
17 there is no evidence presented on that --
18 THE COURT: That's a different issue.
19 MR. SCHRADER: Okay. Good.
20 MR. WOTRING: On the amount of dioxin.
21 THE COURT: Right. That's a different
22 issue. It would be like -- it would be -- and you are
23 not going to do this, but we're talking more on the
24 lines of "and you have no evidence of anything happening
25 between 1966 and 1973." If you say that to Dr. Pardue,

1 he's not going to agree with you.
2 MR. SCHRADER: I understand.
3 THE COURT: That's where we're going to get
4 our little buzz phrase and have to take a break.
5 MR. SCHRADER: That's clear.
6 THE COURT: That's the kind of thing we're
7 talking about, not other issues on -- that have been
8 consistent throughout the case that you-all on both
9 sides have pointed out you don't have evidence on. You
10 are going to make that argument about the amount,
11 they're going to make that argument about dredging.
12 MR. SCHRADER: Thank you, Your Honor.
13 MR. WOTRING: One final point. Counsel for
14 MIMC said yesterday -- I'm looking at 110, and I have
15 copies for everybody. This is a comment about dioxin
16 and participating in the Superfund process. "The right
17 thing is being done" -- quote, "The right thing is being
18 done. The right thing is being done by IP and MIMC in
19 working with the federal government, cleaning up and
20 remediating the site." We think that creates the false
21 impression that they did that willingly and voluntarily,
22 without having to be compelled to do it under the UAO,
23 opening the door.
24 MS. HINTON: Your Honor, I don't think that
25 opens the door in any way. Looking at the stipulation,

1 we had the stipulation that we are working with the
2 federal government with respect to cleaning up and
3 remediating this site.
4 THE COURT: I remember when that was said,
5 and I understand your position on that. I don't think
6 it opens the door. I don't have a problem with reading
7 that portion of the stipulation again that says "As
8 required by federal law," which makes it very clear it's
9 required by federal law. That's not a "they approached
10 the EPA and said 'Why don't we help you.'"
11 MS. HINTON: That's right, Your Honor.
12 THE COURT: I don't think that opens the
13 door to the UAO.
14 MS. HINTON: Thank you.
15 THE COURT: I will say that while it is
16 okay for the defendants to reference the fact of the
17 remediation and that you-all are working on it, that
18 you need to be very careful not to make it look like it
19 is a -- something where, one, you approached the EPA or,
20 two, that it was completely voluntary, because I do
21 think that -- if you say those words, that can create a
22 false impression.
23 I know what you were saying in this opening
24 and it's consistent with the stipulation; but to address
25 the concerns that Harris County raised, I do not have a

1 problem with reading that portion of the stipulation
2 again before we get into the evidence.
3 MS. HINTON: That's fine, Your Honor. That
4 makes sense.
5 THE COURT: Mr. Benedict.
6 MR. BENEDICT: Very briefly, Your Honor.
7 You may recall a couple of weeks ago we again discussed
8 the State's position in the case and I was concerned
9 about the shield and the sword.
10 THE COURT: Okay.
11 MR. BENEDICT: And I heard a lot of
12 references to the government yesterday, including
13 statements to the effect of Harris County and the TCEQ
14 are overreaching in this case. I'm entitled to respond
15 to those things, and I just wanted to get that out
16 there. I don't know that I will be putting witnesses on
17 or whatever, but at closing or at some point in time I'm
18 entitled to respond to those positions.
19 THE COURT: I think it's tricky because
20 some people said it that way, and then somebody else
21 referred to the TCEQ as a nominal party.
22 MR. BENEDICT: And that's also incorrect,
23 but --
24 THE COURT: I know, and we talked about
25 that before. So I think the proper way to handle that

1 is as long as everyone is consistent with the position,
2 which is you-all are here as a necessary party, then I
3 think hopefully that clears up the issue. That was in
4 opening, and now this is going to be how the case is
5 presented. I'm not saying you can't respond. I would
6 have to hear what it is you want to say, but I think
7 it's advisable for all of us to be clear that your
8 position here is as a necessary party and you are
9 separate from Harris County.
10 MR. BENEDICT: And, Your Honor, as we go
11 along, I'm sure we'll talk about it again, but I think
12 I'm entitled to respond. I don't have the transcript,
13 but in particular there were statements that TCEQ did
14 nothing for three years.
15 THE COURT: When there are statements about
16 TCEQ, you are entitled to respond to those.
17 MR. BENEDICT: And they specifically said
18 Harris County and the TCEQ are overreaching on
19 penalties. They didn't say -- that wasn't just a
20 general reference. They specifically named both
21 parties. And so I'm entitled, I think, to address
22 those. I just wanted that out there.
23 THE COURT: You may well be. I think,
24 based on what we all discussed before trial, that
25 everybody needs to be sensitive to separating that out.

1 MR. BENEDICT: Yes.
2 THE COURT: But, yes, I think when people
3 make statements directly at the TCEQ, you are able to
4 respond to that.
5 MR. BENEDICT: After I've reviewed the
6 transcript, I'll have more specific --
7 MS. HINTON: Your Honor, Mr. Wotring
8 indicated some documents he wants to use. Are those for
9 use today?
10 MR. WOTRING: I don't --
11 MS. HINTON: 216, Your Honor. Defendants'
12 216 has nothing to do with --
13 MR. MUIR: Plaintiffs' 215.
14 MR. WOTRING: 216.
15 MS. HINTON: 216 -- I'll get it right in a
16 minute -- has absolutely nothing to do with the
17 impoundment and the facility at issue in this lawsuit.
18 This is dated August 5th, 1965, and it relates to the
19 southern facility, which MIMC didn't operate in, and it
20 has quantities of sludge, et cetera, that have been
21 shipped down to Basin B. This exhibit has, as far as I
22 can tell, nothing to do with the northern impoundment
23 because MIMC hadn't even been incorporated and started
24 operations as of August 5th, 1965.
25 I think they may be attempting to use this

1 to quantify the amount of sludge that they're going to
2 allege within the northern impoundment, the site at
3 issue; but this letter has nothing to do with it. MIMC
4 hadn't even been formed.
5 MR. WOTRING: This document is preadmitted.
6 MS. HINTON: Well, if it's preadmitted, I'm
7 objecting to its use. It has nothing to do -- and I
8 would say it's totally irrelevant, it's very
9 prejudicial, and it's the wrong impoundment.
10 MR. WOTRING: The first document, if we're
11 talking about the 1955 letter, is Exhibit 43.
12 MS. HINTON: I'm sorry. I'm just on 216
13 for now.
14 MR. WOTRING: 216 is preadmitted.
15 THE COURT: This is Plaintiffs' 216. This
16 is an August 5th, 1965 document.
17 MS. HINTON: And if we need to agree on
18 redactions, we need to sit down and agree on redactions;
19 but this letter is talking about the facility south of
20 Interstate 10.
21 THE COURT: Is this letter referring to the
22 southern impoundment?
23 MR. MUIR: Your Honor, in reference to the
24 Court's -- the discussion on preadmitted exhibits -- and
25 this is from Page 88 of the transcript on 10/15, Your

1 Honor said, "All right. The following exhibits are
2 admitted," goes through it. Gets down to 187, 211,
3 211A, 216, 217, 221, 222 through 289. They were
4 preadmitted with no redactions. So we come in at this
5 time to use it with this witness and now they want to go
6 back on an agreement on preadmitting exhibits.
7 MS. HINTON: Well, Your Honor --
8 THE COURT: I still have a question: Is
9 this about the southern impoundment?
10 MR. WOTRING: Your Honor, can you --
11 THE COURT: Oh, sorry. (Screen lowered).
12 And the only reason I raise this is because
13 we have an agreement in this trial that we're not
14 talking about the southern impoundment. So that's why I
15 raised the question.
16 MR. WOTRING: This is talking about the
17 production of sludge at the mill, and we do calculate
18 the amount of sludge going into the impoundments, in
19 part, using this document.
20 MS. HINTON: But it couldn't be this
21 impoundment. MIMC wasn't created yet and shipments sent
22 to this site --
23 THE COURT: Just a moment. You can't both
24 talk at the same time.
25 I think what Mr. Wotring is saying -- he's

1 not saying the amount of sludge that was put into this
2 impoundment. He's saying the amount of sludge that was
3 generated from the plant is what he's offering it for.
4 MR. MUIR: And, Your Honor, there were
5 other documents which specifically talk about these
6 basins and how much they held. So taking -- taking that
7 information, along with this information, is how you get
8 to how much went to the northern impoundment pits. So
9 it is part of a combination of documents which are
10 needed to come up with how much went to those
11 impoundments.
12 THE COURT: So just to be clear, Mr. Muir,
13 you are saying there are documents that show how much
14 waste -- how much sludge went from the plant, and then
15 there is a document that shows how much went into the
16 southern impoundment, and from those two things you
17 extrapolate how much went into the northern impoundment?
18 Is that what you are saying?
19 MR. WOTRING: No.
20 THE COURT: Okay.
21 MR. WOTRING: Documents from the plant and
22 then documents about the pit is how you do it.
23 THE COURT: I understand. But this is
24 about a different pit. And the reason you are getting
25 an objection is if it is about the southern impoundment,

1 then it wouldn't be relevant to any expert opinions in
2 this case as to any of the waste that's alleged to have
3 gotten out adjacent to or in the San Jacinto River in
4 this case.
5 MR. WOTRING: We can read through it. It's
6 talking about the contract that was assigned to MIMC,
7 and it's talking about the contractor having trouble
8 getting to the site. And Ole Peterson is the firm prior
9 to MIMC. It's talking about this site.
10 MS. HINTON: No, Your Honor. MIMC hadn't
11 been formed. The contract hadn't been assigned. The
12 impoundment at issue in this case hadn't been started
13 for sludge to go into it. He's saying this document
14 relates to the MIMC operations. It absolutely does not.
15 MIMC hadn't even been formed.
16 THE COURT: I understand. Okay. I think
17 what Mr. Wotring -- whether it's related to MIMC's
18 operations or not, the question is: Is this document
19 talking about what is put into the southern impoundment?
20 That's my question.
21 MS. HINTON: Yes.
22 MR. WOTRING: Here is a hard copy of the
23 document (document tendered).
24 MR. CARTER: The answer to your question is
25 yes, Your Honor --

1 MS. HINTON: Yes.
2 MR. CARTER: -- because it's been
3 established that the first disposal into this site did
4 not start until September of '65 with no --
5 MR. WOTRING: No.
6 MR. CARTER: Excuse me -- with MIMC. And
7 that disposal operation ended in May of '66. That has
8 been the period of time. There is no dispute about
9 that.
10 MR. WOTRING: No. There is clearly a
11 dispute. Ole Peterson put sludge into this site prior
12 to MIMC being in existence.
13 MR. CARTER: There is absolutely no
14 evidence to that.
15 MS. HINTON: There is no evidence.
16 MR. WOTRING: I can put that on the stand.
17 THE COURT: You believe there is evidence
18 that Ole Peterson put sludge into these pits at issue in
19 this trial before MIMC was involved?
20 MR. WOTRING: Yes. I'll lay the foundation
21 for this document.
22 THE COURT: And who are you going to lay
23 the foundation through?
24 MR. WOTRING: With Dr. Pardue.
25 MS. HINTON: No personal knowledge, Your

1 Honor. It would be hearsay.
2 MR. STANFIELD: Your Honor, Dr. Bedient is
3 the corporate rep who testified the time period of
4 operation at issue in this lawsuit was September 13th,
5 1965 to May 10, 1966. That is the binding position of
6 Harris County as given through its corporate
7 representative.
8 MR. WOTRING: I --
9 MR. STANFIELD: Earnest, I'm not finished.
10 Please stop cutting us off.
11 So I'm going to try to pull that out for us
12 to consider as we talk about this issue.
13 THE COURT: I think that is different from
14 what Mr. Wotring is saying. He's not saying that the
15 time period isn't that time period. What I think he's
16 saying now is that he believes that Ole Peterson put
17 some sludge in the northern impoundment prior to MIMC.
18 MR. WOTRING: How about I lay the
19 foundation with other documents, and when we get to this
20 point, and we'll probably be at a point we can address
21 it with the foundation.
22 THE COURT: I'll let you see if you can lay
23 the foundation to connect it up. You understand what my
24 concern is. As long as it's talking about the northern
25 impoundment, it may be relevant. But if we're talking

about the southern impoundment, we've all agreed that's not part of this case and I don't think what is in the southern impoundment, unless you can link it up, would be relevant to the allegations of the amount of waste in the northern impoundment. So I'll let you lay the foundation.

MR. WOTRING: Then Exhibit 43 has also been preadmitted.

MR. STANFIELD: With a redaction. Page 4, Your Honor, there is a reference --

Jen, do you have control?

Let's go to Page 4, under Paragraph No. 2 in that second one, there was a reference to the black liquor operation at about the bottom third. That needs to come out.

THE COURT: Okay.

MR. STANFIELD: That's all I'm asking for.

THE COURT: So just to be clear for purposes of what I'm going to read to the jury before we start, I'm just going to read the first two sentences of the stipulation.

MR. WOTRING: Harris County would not request that.

THE COURT: You do not want that?

MR. WOTRING: No.

1 THE COURT: Okay.
2 MS. HINTON: Your Honor, the corporate
3 rep's testimony, I'll let Mr. --
4 MR. STANFIELD: So what he's saying is --
5 this is John Pardue, actually, on 116 of his deposition,
6 starting on Line 4.
7 MR. CARTER: Corporate representative?
8 MR. STANFIELD: This is March. I believe
9 this may be as an expert. "It is my contention that on
10 or after September 13th of '65 is when waste first began
11 going to the northern pits that belong to or that had
12 been developed by Mr. McGinnis." "First began going."
13 MR. WOTRING: That had been developed by
14 Mr. McGinnis. Again, we'll lay the foundation when we
15 get there, when we get there, or not.
16 THE COURT: I'll let you lay the
17 foundation. If we need to take a break once we get to
18 that document, we will.
19 MR. CARTER: Judge, if I may, because of
20 the way this is getting sorted out, I would ask that the
21 foundation even be laid outside the presence of the
22 jury, since we don't know what foundation he can
23 possibly lay to establish that.
24 MR. WOTRING: In all fairness, this is a
25 preadmitted exhibit that they are now objecting to.

1 THE COURT: I understand, and I'm aware of
2 that. For my purposes, the only thing I'm concerned
3 about is whether or not it's talking about a pit that's
4 not part of this trial. That's my concern, whether the
5 document has been admitted or not.
6 And if that's not your intention, then I'm
7 going to see how you link it up to the northern
8 impoundment.
9 MR. WOTRING: That is not my intention.
10 And I think we've been very clear that the southern
11 impoundments are not part of this case.
12 THE COURT: You have. That's why I'm
13 asking that question, because to me, that's the only
14 thing that's relevant at this point with regard to these
15 documents.
16 MS. GRAY: Your Honor, I just want to point
17 out that even Dr. Pardue, on Page 7 of his report,
18 writes "By September 1965, MIMC had constructed
19 approximately 12 acres of waste pits on the site
20 adjacent to the San Jacinto River just north of I-10.
21 These pits were filled via barge loading and unloading
22 operations conducted between September 1965 and
23 May 1966."
24 It seems like we're just going off on an
25 excursion now to try to confuse the jury with regard to

1 when waste -- Harris County's position as to when waste
2 was going into the northern impoundment pits.
3 THE COURT: How soon do you think -- thank
4 you, Ms. Gray -- do you think you're going to get to
5 this issue? I'm trying to decide if it's something
6 where we can get you going, take a break, lay the
7 foundation outside the presence of the jury, let you-all
8 take a break and go back into court.
9 MR. WOTRING: Yes. I think we have plenty
10 of time, and I'm not able to confuse the jury before I
11 ask my first question.
12 THE COURT: Are we ready to go, other than
13 that issue? So what we'll do is get going with the
14 first witness, and we'll take a break, we'll start our
15 break with laying the foundation for this document and
16 then let you take a break. And then bring the jury back
17 in, once I rule. With that, we'll line up the jury.
18 (After a break, the jury was present and
19 the following proceedings were had:)
20 THE COURT: Good morning. Please be
21 seated.
22 Thank you for your patience, ladies and
23 gentlemen, while we dealt with some evidentiary matters.
24 We're now ready to proceed.
25 Mr. Wotring, call your first witness,

please.

MR. WOTRING: Yes. Harris County calls John Pardue to the stand.

THE COURT: Dr. Pardue, raise your right hand to be sworn, sir.

(Whereupon the witness was sworn)

Please be seated. There is water there for you if you need it.

You may proceed.

MR. WOTRING: May I proceed from the podium, Your Honor?

THE COURT: Yes, sir.

JOHN PARDUE, Ph.D.,

having been duly sworn, testified as follows:

DIRECT EXAMINATION

QUESTIONS MR. WOTRING:

Q. Would you please tell us what you do for a living, Dr. Pardue?

A. I'm a professor of civil and environmental engineering at Louisiana State University.

Q. And I think we have a copy of your resume. Do you call it a resume or do you call it a CV?

A. CV.

Q. What is the difference?

A. I don't know.

1 MR. WOTRING: If we could pull up Exhibit
2 No. 291.
3 Q. Does that list your educational background,
4 your employment history, kind of sketch what you've done
5 in your professional career?
6 A. It does.
7 Q. Where do you live?
8 A. I live in Baton Rouge, Louisiana.
9 Q. Are you married?
10 A. I am.
11 Q. Do you have kids?
12 A. Three kids.
13 Q. Do they all still live with you?
14 A. They do.
15 Q. All right. And what type of engineering do you
16 do?
17 A. Environmental engineering.
18 Q. And how would you describe to somebody you just
19 met at a party what environmental engineering is?
20 A. We stand between the activities of humans and
21 the environment to try to make sure there is no effects
22 of humans on the environment.
23 Q. So when did you start your training as being an
24 environmental engineer?
25 A. Back in the mid '80s.

1 Q. And where did you start?
2 A. I did a biology degree at Rhodes College in
3 Memphis and then a master's in marine sciences and
4 started my civil engineering training at LSU and
5 finished that Ph.D. up in 1992.
6 Q. Okay. So what have you been doing since 1992?
7 A. I have been at LSU in one role or another,
8 doing teaching, research and service.
9 Q. Okay. I think, if we can find -- I'm going to
10 give you the laser pointer. We'll just go through the
11 top few lines on your CV. Way up at the top is fine.
12 The first line there says "Director of the Louisiana
13 Water Resources Research Institute." Do you want to
14 orient everybody about that with the laser pointer?
15 A. Okay. There (indicating).
16 Q. What do you do as the director of the Louisiana
17 Water Research Institute?
18 A. There's one of these entities in every state,
19 and there's even one in Guam and Virgin Islands. And
20 what we do there is try to work together across states
21 or within our state to understand water issues in the
22 state. And we have a little money from the federal
23 government that we give out to faculty to do research.
24 So, for example, we did work on Hurricane Katrina, the
25 water impacts of that, for example, when that occurred

in Louisiana.

Q. And what do you do as the director there?

A. So I coordinate all the programs. I have a system by which I give the money out. And we also do our own activities, trying to organize research activities for the state water programs.

Q. What's the next line on the top part of your CV?

A. It's another research center. It's Hazardous Substance Research Center, South and Southwest that I co-direct.

Q. And what do you do as the co-director of that center?

A. We primarily work at sites like the one in question here. We research better ways to clean the sites up, which is what my area of research interest is. So we work at hazardous waste sites all over the country and try to develop new and cheaper methods, better methods for cleaning them up faster, basically.

Q. The next line I get, Louisiana State University. After that it says you're the professor of civil and environmental engineering, the Elizabeth Howell Stewart Professor?

A. Yes.

Q. What does that mean?

1 A. That means I have an endowed chair that's named
2 after a lady who donated some money to the university.
3 Q. And do you have tenure at LSU?
4 A. I do.
5 Q. And what -- would you tell us what that means?
6 A. Tenure is a system by which we have a
7 seven-year probationary period when we first get hired
8 on at the university. And we do all the work that is in
9 resume -- teaching, research, and service; and then at
10 the end of -- at the end of that period, they evaluate
11 you, whether you met a certain standard. And then if
12 you don't, you have to leave; and if you do, you get to
13 stay.
14 And what it essentially gives is academic
15 freedom. I can work on, like, a controversial case like
16 this or a site like this, and I can make that decision,
17 if it's in the interest of my research program. I don't
18 have to ask permission if I can work on certain problems
19 or not. It's an academic freedom issue.
20 Q. You bring up an interesting point. You're not
21 working for LSU here today?
22 A. I am not.
23 Q. And you are not speaking on behalf of LSU in
24 any way?
25 A. No, I am not.

Q. So you are just speaking on behalf of John Pardue?

A. Me, personally, correct.

Q. And what does LSU think about you doing this type of activity? Do they object to it?

A. No. The engineering college -- of course, we're teaching students to be engineers, so I don't do a lot of this expert witness work. But when I go out and am asked to help at a hazardous waste site or make decisions about it, they want me to practice, so when I turn around and teach a student, I'm not just someone who is in the lab or in my office all the time; but I'm actually out. They try to get us out a day a week. That is the kind of guidance we have.

This is one of the activities. But I'm not normally in these court situations, but it's one of the type of activities. I have to fill a form out that tells them what I'm doing, so they will know. But that is the system that we have for doing this type of outside work.

Q. And what do you do with respect to teaching undergraduate students at LSU? Do you?

A. I do. I coordinate the undergraduate environmental engineering program. We're the only program in the Central Gulf Coast. We attract students

1 from this state, from Louisiana, from Arkansas,
2 California, who want to study environmental engineering,
3 and I coordinate that program for the university.
4 Q. And have you ever worked on any sites that
5 involved dioxin before?
6 A. I have.
7 Q. Would you tell us about those sites?
8 A. The one site that I'm working on now is the
9 Passaic River in New Jersey. So that's in Newark, right
10 outside kind of the shadow of New York City. And
11 it's -- the river was kind of the start of the
12 industrial revolution of the United States, a very
13 polluted river. And they have a dioxin problem. And
14 I've been -- I'm coordinating a large field study to try
15 to develop a new cleanup technique for the sediment from
16 that river. That's one of the largest Superfund sites
17 in terms of cost in the country. So I'm coordinating a
18 study with Texas Tech and Rutgers and LSU to develop a
19 new method of cleaning up those sediments.
20 Q. And have you done any sort of work on other
21 contaminated sites?
22 A. Yes.
23 Q. Would you please describe some of that work, in
24 addition to the Passaic River work?
25 A. So I tend to bounce around at Superfund sites

1 that involve wetlands in some way, because I'm from
2 Louisiana. We contaminate a lot of wetlands. The petro
3 processor site is in Baton Rouge. I've been working
4 there for 20 years. It's a site similar in setup to
5 this site. It was pits that -- a man owned some land
6 and he built some levees around a piece of low land and
7 then invited industry to come in and dump chemical waste
8 into those pits. And some of that leaked out and so
9 we've been researching ways of cleaning up the pits that
10 remained.
11 I worked at the Aberdeen Proving Ground,
12 which is in Maryland. It's an Army base. And that's
13 where the U.S. developed all their chemical weapons. So
14 they had lots of activities out there that involved
15 chemicals. So I've helped them clean up locations.
16 And the Resolve Superfund site, which is in
17 Massachusetts, they're actually using a technology that
18 I developed in my lab to do the cleanup of that site.
19 So I'm up there quite a bit, on the phone with them
20 every week to make sure that what I proposed is actually
21 working. Those are three examples.
22 Q. Have you -- what did you do your master's
23 thesis on?
24 A. I worked on PCBs and dioxin, the chemical
25 that's involved in this case, and looked at ways in

1 which they broke down, which they degraded in the
2 environment and how stable they were, et cetera.
3 Q. And how would you describe dioxin? What kind
4 of chemical is it?
5 A. It's a chlorinated -- because it has chlorines
6 on it -- it's chlorinated and we call it hydrophobic.
7 It tends to get out of water. It doesn't want to tend
8 to be in water. And it's an organic compound, so it's
9 made of carbons and hydrogens. And it has these
10 chlorines, as well, on the structure.
11 Q. And if you are using it in the lab, is it
12 considered a hazardous substance?
13 A. Yes, yes. You have to use controls and things
14 when you are using it in the lab.
15 Q. Have you also used hexachlorobenzene in your
16 work?
17 A. Yes.
18 Q. And why -- is there any relevance between your
19 work with hexachlorobenzene and the analysis of dioxin?
20 A. Well, at this petro processor site that I
21 talked about, that is a waste product, similar to
22 dioxin, of industrial processes and industrial -- it's
23 an industrial waste. And so it was in these pits and
24 leaked out, and it behaves similarly to dioxin in the
25 environment. So at this site, the petro processor site,

we tracked where it moved, et cetera. We also used it as what's called a surrogate or a substitution for dioxin, because it's a little easier to work with. It's not as hazardous to the students. So we used it as a -- just a thing that we can substitute in for studies instead of the dioxin.

Q. And why -- why can you use it instead of dioxin for your studies?

A. It has similar water solubility. It tends not to want to be in water. It has chlorines. It behaves similarly in the environment to dioxin.

Q. You used a term -- what does "water solubility" mean?

A. That means how much of the chemical will go into -- into water, what is the -- what is the mass or how much of it will go into water.

Q. Give us something from our day-to-day life. What is a high soluble compound?

A. Like when you're putting sugar into tea, you'll keep adding sugar, adding sugar, eventually it collects at the bottom. It won't dissolve any more, so you reached the limit of the solubility that's there.

Q. What is a low solubility?

A. That means it -- it just -- just a fraction or a small amount of it.

1 You'll see it collect at the bottom of the
2 container instead of dissolving into the water, itself.
3 Q. So is solubility the tendency of something to
4 be dissolved in water?
5 A. It is. Yeah, that's the definition.
6 Q. And how do you compare the solubility of
7 hexachlorobenzene with the solubility of dioxin?
8 A. They're pretty similar, yeah. They're very,
9 very sparingly soluble.
10 Q. So why would you use hexachlorobenzene in your
11 lab instead of dioxin?
12 A. Just as a safety issue with the students.
13 Q. Okay. Have you published in the field of
14 environmental engineering before?
15 A. I have.
16 Q. And would you talk about the different articles
17 that you've published?
18 A. I've published about 60-plus, more than 60
19 peer-reviewed articles. So I write about -- when I go
20 to these sites or I do experiments back at the lab, I'll
21 work with a student and do a set of experiments, either
22 in the field or in the lab. We'll write that up, and
23 then we send that off to a journal, like a magazine, but
24 it's a little different. No one reads it, is the first
25 reason.

The second thing is that it -- it -- it's peer reviewed. So they send whatever I submit out to other professors or experts, like myself, and they criticize what I did. They write comments. Then I have to either -- they either accept it or they reject it, and I have to respond to their comments. So it's a really rigorous kind of peer-review process.

Q. Okay. And do you serve as a peer reviewer for journals?

A. Right, yes. So if I submit and make other people look at my work, I have to return the favor and participate in that process, as well.

Q. So what kind of journals do you review articles for?

A. All of the big ones in our field, "Environmental Science & Technology" is one, "Chemosphere." I just got a notice to review an article today on biodegradation this morning. So I'll get one of those notices every couple of weeks.

Q. And have you conducted any environmental engineering studies on wetlands and marsh areas in the Gulf Coast, Louisiana and Texas?

A. Yes. So I have been -- obviously, this petro processor site is a wetland site. I have worked at other sites and been in marshes. I have been very

1 involved in the Deepwater Horizon response. I work on
2 how better -- in the marshes that have been oiled, how
3 do we clean that up. So I have been there, to the
4 coast, over a hundred times since the spill. So that's
5 been a big part of my efforts over the last four years.
6 Q. Okay. And let's get to your work in this case.
7 What generally were you asked to do in this case? Let's
8 start with who asked you to do it.
9 A. You did.
10 Q. Okay. And what did I ask you to do?
11 A. You asked me to do two things. You asked me to
12 look through the historical documents. We have a lot of
13 old records here from the plant and from correspondence
14 back and forth of various people. So I was asked to
15 sort of develop a timeline, what things happened when,
16 who was involved, you know, why did they make that
17 decision. So develop a historical timeline was the
18 first thing you asked me.
19 And the second thing you asked me was to
20 help understand the processes by which dioxin left the
21 pits, so what were the different mechanisms by which the
22 waste that was there could leave over the time period
23 that is of interest in this study.
24 Q. Okay. And what -- what documents did you look
25 at, or what information did you have in doing your work

in this case?

A. So I had these historical documents. They saved a lot of records, so I had all of that. And that was memos and diagrams. I had a lot of aerial photography. I had some regular photography. And so all of that information was there, the historical material.

Then I had all of the data that's been collected out there in the past, you know, 15 years as they have been studying the site. That was done by the consultants working for the parties involved in this process, and also a study that the University of Houston did, for example, and they took samples near the site. So I reviewed that work.

And then the third thing is just the scientific literature in general, just any kind of a paper that was done on a similar site that was relevant to the -- to the processes that we're talking about here.

Q. And are you being paid for your time here, sir?

A. I am.

Q. And how much are you being paid and how are you being paid?

A. You pay me. And I get paid $250 an hour for the work that I do.

1 Q. And how much -- how many hours have you spent
2 on this case?
3 A. I have worked about 200 hours so far on this
4 case. And I guess with all of my travel and everything
5 together, I have been over here probably more than a
6 dozen times, I have made about $54,000.
7 Q. Again, that goes to you, it does not go to LSU,
8 correct?
9 A. Correct.
10 Q. Well, let's talk generally about your opinions
11 in this case. Were you able to determine how the
12 process operated by which sludge from the plant was sent
13 to the impoundments?
14 A. I was.
15 Q. Okay. In your review of the information, did
16 you see any indication that sludge from anywhere else
17 came to -- went to the impoundments other than sludge
18 from the Pasadena plant?
19 A. No. I think all the sludge that's in that --
20 in those pits is from the Champion Pasadena plant.
21 Q. And is -- is there waste from any other source
22 in those pits that we're here about, other than from the
23 Champion Pasadena plant?
24 A. I found no information that anything else is
25 there but the waste from the Champion plant.

1 Q. And let's just make sure we're talking about
2 the same thing.
3 MR. WOTRING: Could you pull up Exhibit
4 No. 31?
5 Q. And what is Exhibit No. 31?
6 A. That's a 1966 aerial. So an overflight in a
7 plane, taking pictures of, you know, the whole area; and
8 those are the waste impoundments. As you see, they're
9 just north of the I-10 bridge there, the San Jacinto
10 River and the west side of the river.
11 Q. So when you and I are talking about the
12 impoundments, you and I will be talking about those on
13 this picture. Is that all right?
14 A. Yeah, those three, uh-huh.
15 Q. Where do you see three and why do you see
16 three?
17 A. So this is the -- this is the most western one
18 here (indicating), so we'll call that 1. And then we
19 have kind of a small one in the middle here, an
20 impoundment, and then we have kind of an inverted C,
21 which is on the outside. To keep things simple, I'll
22 say 1, 2 and 3, just to go left and right.
23 Q. Say that again. Which one is 1?
24 A. This one is 1. I'm outlining it with a
25 pointer. There is a berm, like a levee in between here

(indicating).

Q. Let's stop right there. What is a berm?

A. A berm is an earthen structure, so soil pushed together to make a little wall to kind of separate two -- you know, two systems or two bodies of water, for example.

Q. Is there a difference between a berm and a levee?

A. I'm sure there is. I'm using them interchangeably here.

Q. So we can talk about berms, we can talk about levees?

A. Right.

Q. So which one is the first one again?

A. This one (indicating), on the most western side.

Q. Which one are you going to call Pit No. 2?

A. I'm going to call this internal -- this one on the inside here Pit No. 2.

Q. Which one are you going to call Pit No. 3?

A. I'm going to call this one that is kind of an inverted C-shape, this outside one is Pit No. 3.

Q. Okay. We're going to do that one more time and then we're not going to do that again.

A. Okay. Good.

Q. Tell me which one is Pit No. 3? Which one is it?
A. This one (indicating).
Q. Where is Pit No. 2?
A. In the middle.
Q. And where is Pit No. 1?
A. There (indicating).
Q. So we're talking about the pits? We're talking about 1, 2 and 3, right?
A. Correct.
Q. We're talking about the impoundments? We're talking about all of them together?
A. Yes.
Q. And when we're talking about Pit 1 or Pit 2 or Pit 3, we're meaning that one pit?
A. That's correct.
Q. All right. Well, were you able to calculate how much sludge went into the impoundments?
A. Yes. They kept good records because they were paying a contractor to move this material. So they had a way of calculating the amounts that they moved, which was actually really useful for figuring out how much left the plant and went here. So all of that information is available, even in multiple different forms. So that was relatively straightforward to know

how much material actually went to the impoundments.

Q. And when you looked at all the information, did you calculate how much sludge went into the impoundments?

A. I did.

Q. And how much was it?

A. Somewhere between 125,000 cubic yards and 130,000 cubic yards.

Q. A cubic yard is what?

A. A 1 yard by 1 yard by 1 yard box.

Q. And so it's a 3-foot box?

A. 3 feet by 3 feet by 3 feet, yeah.

Q. And so have you calculated how many -- we were trying to figure out how to explain that, and you came up with the idea of an Olympic swimming pool?

A. Right. When I say "Olympic swimming pool," an Olympic swimming pool is about 50 yards long and 20 yards wide and 6 yards deep. So that would be -- we're talking about 125,000 cubic yards, that's 38 pools, just to get that volume in mind.

Q. So when they used these pits, they filled them with 38 Olympic sized pools filled with sludge?

A. Correct.

Q. And the -- is "sludge" the right term?

A. It's actually sludge mixed with more water.

1 I'm just talking about the sludge part now, not the
2 water. They had to add more water to move it, so that's
3 in addition to the sludge.
4 Q. They started out with 38 pools of sludge?
5 A. Right.
6 Q. And then you had to add water to it?
7 A. Right.
8 Q. To get it to the impoundments?
9 A. Exactly.
10 Q. We may be getting ahead of ourselves. Is
11 "sludge" the right term to use?
12 A. Yes. That's an industrial waste term we use
13 in, you know, water treatment systems like was used at
14 the Champion plant. So "sludge" is the term.
15 Q. Now let's back up to the Champion plant. What
16 kind of plant was it?
17 A. It was a kraft paper mill.
18 Q. What does that mean, "kraft paper mill"?
19 A. Well, the kraft process is still in general use
20 today, with some modifications; but you bring a tree to
21 the property, you take the bark off, you shred it into
22 little chips, you put that into a cooker and add
23 something called white liquor. White liquor is a
24 mixture of caustic soda, which is a base, and sodium
25 sulfide, two chemicals. It has a white color. And you

1 react that with the tree.
2 Q. Okay. And then it breaks down in some waste
3 products?
4 A. Right. Yes. You get some waste products there
5 and you get the fibers that go to make the paper. That
6 gets bleached, and that's what it does.
7 Q. Let me walk you through this a little bit. The
8 fibers go on to make the paper?
9 A. Right.
10 Q. They get compressed and then they get
11 bleached --
12 A. Yes.
13 Q. -- and turn white, like this, right?
14 A. Right.
15 Q. So you take the fibers and you press them -- at
16 the end of it, you get paper like this?
17 A. Paper or cardboard.
18 Q. Paper or cardboard?
19 A. Right.
20 Q. And what you are left with are some waste
21 products, including sludge?
22 A. Right.
23 Q. Okay. And when you -- how does this process
24 work? Does it use a lot of water?
25 A. Yeah, paper mills use tremendous amounts of

1 water. This plant used 26 million gallons of water
2 every day. And if we're using our Olympic swimming pool
3 analogy again, that is around 34 Olympic swimming pools
4 every day that ran through the plant.
5 Q. And at the other end, you would get -- does it
6 work in a continuous process?
7 A. 24 hours a day, 7 days a week.
8 Q. So if it shuts down, is that a big deal or a
9 little deal for a paper mill plant?
10 A. It's a big deal.
11 Q. Okay. And so at the end of this process, you
12 get waste materials, including sludge, right?
13 A. Yes. The water has to be -- you can't just
14 throw the water out into the environment, you have to
15 treat it. So at the time the treatment was you'd run it
16 through a basin, kind of a big swimming pool, think of
17 it that way. The water would slow down. And then the
18 particles that are in the water, including the fibers
19 that were left over as waste or bark pieces or other
20 chemicals, would settle out to the bottom of that basin.
21 And then they would take that solid material, that
22 waste, and pump that into another series of very, very
23 large basins. And those are many acres in size, and
24 essentially that would hold the same amount that were
25 moved to the plants, so 135,000 cubic yards, which is

1 the 38 swimming pools. So that's how much they would
2 leave that there. It would be a couple years worth of
3 stuff that would be in these larger basins.
4 Q. Okay. And the sludge at the plant before it
5 was sent to the impoundments, what was it like? We've
6 got some documents, but what was it like, generally?
7 MR. SCHRADER: Objection, no personal
8 knowledge.
9 THE COURT: Please rephrase.
10 Q. (By Mr. Wotring) Based upon your review of the
11 information in this case, were you able to formulate
12 an -- formulate an opinion about the characteristics of
13 the sludge at the Champion Pasadena paper mill?
14 A. Yes.
15 Q. So would you tell us, based upon your review of
16 the information, about what that sludge was like?
17 MS. GRAY: Objection, Your Honor. No
18 foundation with regard to his expertise in paper sludge.
19 THE COURT: All right. If he's referring
20 to a particular document, I think that's fine, based on
21 his review; but I think if anything goes beyond that,
22 then we need to address that separately.
23 Q. Well, let's look at Exhibit No. 43.
24 MR. WOTRING: May I approach?
25 THE COURT: Yes.

(Documents tendered).

MR. WOTRING: I've got six.

MR. REASONER: These have your notes.

Q. (By Mr. Wotring) All right. Have you seen Exhibit No. 43 before?

A. I have.

Q. Let's walk through Exhibit No. 43. The document is from September 21st of 1955, right?

A. Yes, it is.

Q. And let's talk about this document. What -- what does it tell you about the sludge?

A. It's a letter between two people that worked at the plant. And it gives -- it's essentially sort of brainstorming methods of disposal of this material. And as part of those brainstorming process, the sludge is characterized and measurements are made on it to identify its properties.

Q. Does it talk about what kind of consistency the sludge is at the plant?

A. It does.

Q. And where is -- where would we find that information about sludge at the plant?

A. You would go to the second page, about two-thirds of the way down. Right there would be great (indicating).

1 So the sludge that's in these first
2 swimming pools -- I was talking about the primary
3 basins -- this is the stuff that has to get cleaned out
4 first.
5 Q. This is stuff at the plant?
6 A. At the plant, right. It's 93 percent moisture
7 and 7 percent solid, so it's a very wet material. That
8 is put into the secondary basins that we're talking
9 about. As it sits, what happens, it compresses. So the
10 solids there, you know, you are leaving it in there for
11 years, a couple of years. The solids settle down and
12 the water at the top remains, and that water was
13 discharged to make more room for more sludge to settle.
14 So think of a process where you load a very
15 kind of wet mix of water and solids. It settles down,
16 they pump the water off and add the next day's version,
17 the next day's version, so forth and so on.
18 As it sits, it goes to about 56 percent
19 moisture. So it's still mostly water, but it's -- but
20 it's a solid, kind of a fibrous material that is a
21 mixture of water and solids.
22 Q. Okay. And that's what it was like at the
23 plant?
24 A. Yes.
25 Q. Okay. Well, let's go back to the first page of

1 Exhibit No. 43. Now, you were talking about two people
2 were having a conversation. Who are the two people
3 here?
4 A. Well, Talboys, I think at the time --
5 MR. SCHRADER: Objection, no personal
6 knowledge.
7 Q. (By Mr. Wotring) Have you seen documents
8 reflecting who Mr. Talboys was?
9 A. Yes.
10 Q. And who was Mr. Talboys, based upon your review
11 of the documents provided to you in this case?
12 A. He was a worker at the Champion plant who was
13 responsible for this particular aspect of the plant.
14 Q. And who -- who -- do you know who Mr. Chase is?
15 A. I do not.
16 Q. Okay. And what is Mr. Talboys discussing in
17 this memo, generally, based upon your review of it?
18 A. Well, these basins would fill. And so what
19 Mr. Talboys is discussing is how will we unload this
20 material and take it off site because we're -- once the
21 basins are filled, there is no more room and the plant
22 will shut down. So they're working through various
23 options of where to take this sludge material.
24 Q. Okay. Let's read the first paragraph there to
25 kind of orient ourselves. What does it say?

1 A. "A survey has been made of the possible ways by
2 which sludge collected in our settling basins might be
3 disposed of permanently. The various methods are
4 tabulated below, together with the volumes of sludge
5 involved and approximate costs of transporting the
6 sludge to hypothetical disposal sites."
7 Q. And then it lists the different methods of
8 disposal. And just one of them is "pumping of wet
9 sludge to spoil area." There is "pumping of wet sludge
10 to barge and disposal at sea," correct?
11 A. Correct.
12 Q. And then it's talking about "barging of drained
13 sludge to the sea" as well?
14 A. Correct.
15 Q. Let's talk about what the next paragraph says.
16 Why don't you read that for us?
17 A. "Hauling drained sludge by rail to a land
18 disposal site 50 or even 100 miles distant appears to be
19 cheaper than either trucking the sludge to a similar
20 distance or barging it to sea for disposal."
21 Q. Okay. And what does the next sentence say?
22 A. "Furthermore, it is unlikely that dumping of
23 sludge any closer to shore than 110 miles," which is a
24 "(400 fathom depth) would be approved. However, costs
25 of handling sludge both at the mill and at the disposal

1 site, cost and availability of land, and other details
2 must be investigated fully before any conclusions can be
3 drawn."
4 Q. So let's go back up to the top of this
5 document. And this is dated September 21st, 1955. And
6 remind me what year the filling of the -- the
7 impoundments that we're here about took place.
8 A. We're talking about a decade later in this
9 particular matter.
10 Q. So this document is 10 years before the filling
11 of the impoundments?
12 A. Correct.
13 Q. All right. And what does Champion know about
14 the sludge, based upon Exhibit No. 43, if they wanted to
15 dispose of it at sea?
16 MR. SCHRADER: Objection, calls for
17 speculation.
18 MR. WOTRING: I believe that the answer --
19 well, I'll rephrase.
20 THE COURT: All right.
21 MR. WOTRING: Would you go to the paragraph
22 below the table and blow it up?
23 Q. (By Mr. Wotring) So in this internal Champion
24 document, it states that "It is unlikely that dumping of
25 sludge any closer to shore than 110 miles (400 fathom of

depth) would be approved." This is a statement from an internal Champion document in September of 1955, right?

A. Yes, it is.

Q. Okay. And did this document provide you with information in formulating your opinions about how -- how much sludge was placed into the impoundment?

A. Yes. There is lots of information here, both on the quality of the material and the amounts that are produced on a daily basis.

Q. Well, let's talk about the quality of the material. Which portion of this document discusses the quality of the material?

A. If you'll go to the second page at the top --

Q. Yes.

A. -- this first top part is analysis that was done just to see whether it would be used as a fertilizer; so does it have any nitrogen in it that you could give it to a farmer and mix it in with the land and use it as a fertilizer. And the analysis concluded that it had little fertilizer value.

If you'll go up a little bit, so this second set of analyses is sort of the gist of what is in the material. This first one is essentially calcium carbonate. It's limestone and it's an inert material, but it's 43 percent of the sludge.

1 And then volatile matter present, that's --
2 that's the organic part, the fiber that is present in
3 the waste material.
4 Q. And based upon your review of the documents in
5 this case, do you have an opinion about what the word
6 "volatile" means in that context as used in Exhibit
7 No. 43?
8 MR. SCHRADER: Objection, calls for
9 speculation. I have another objection, if we could just
10 approach briefly, Your Honor?
11 THE COURT: Yes, sir.
12 (Whereupon, after a bench discussion
13 outside the hearing of the reporter and jury, the
14 following proceedings were had:)
15 THE COURT: Ladies and gentlemen, we're
16 going to give you a quick break while we address an
17 issue. We'll bring you right back in.
18 (Jury not present)
19 (Whereupon, the witness left the courtroom)
20 THE COURT: Please be seated.
21 Okay. As I understand the objection, the
22 objection is that this is a document from 1955 that
23 references the composition of sludge back in to the '40s
24 and that the defendants believe that the testing that
25 was done on the actual material that was hauled from the

1 plant to these pits is in conflict with that. Is that
2 the objection?
3 MR. SCHRADER: The objection is --
4 THE COURT: So, therefore, there is no
5 evidence that the sludge was of the same composition at
6 this time.
7 MR. SCHRADER: Correct.
8 THE COURT: Mr. Wotring. I must admit, I
9 have not compared the two documents, so I don't know
10 what the difference would be.
11 MR. WOTRING: Well, I'll ask the witness
12 from the stand if they're the same. If not, I'll move
13 on.
14 MS. GRAY: Your Honor, our objection is
15 there is no foundation that has been laid that he is an
16 expert in the paper-making processes and how it changed
17 from 1947 to 1965.
18 THE COURT: That's true. I don't think
19 he's intending to present himself as such an expert, is
20 he?
21 MR. WOTRING: Only in the sense that he's
22 going to be asked questions about the process at the
23 Pasadena plant and whether the sludge had been the same
24 as the sludge in '65.
25 THE COURT: So how do we deal with the

1 objection, if that's accurate, that the testing of the
2 material is in conflict with what that document shows of
3 sludge that dates back to the '40s? How do we address
4 that? I mean, I don't mind if you ask him that
5 question, technically, do the two documents say the same
6 thing. I think what they're objecting to is him somehow
7 extrapolating from that that the sludge is actually the
8 same composition, if it's in conflict with the actual
9 documents.
10 MR. SCHRADER: And just to be clear, Your
11 Honor, my objection is that there is no foundation that
12 whatever the testing was done at this time would apply
13 to later sludge 20 years or 18 years later. I don't
14 think it's our burden to show that there is an actual
15 conflict.
16 THE COURT: I'm not saying it is. I'm just
17 saying you brought that up, that there is a conflict.
18 So...
19 MR. SCHRADER: My understanding is that the
20 processes at the plant changed over that time, and we
21 have somebody who could -- we could make an offer on
22 that, offer of proof on that point. But, again, I think
23 the foundation first needs to be established.
24 THE COURT: So, in other words, their
25 objection is that you can't just say, "Well, I have

1 looked and there is nothing that shows that it changed."
2 When you have a foundation objection, you've got to show
3 that it was the same.
4 MR. WOTRING: I understand the foundation.
5 It's sounds to me like they have a foundation objection,
6 and it's being sustained.
7 THE COURT: Well, I'm asking you --
8 MR. WOTRING: Right.
9 THE COURT: -- whether or not I should
10 sustain it. In other words, do you have any documents
11 to show that it was actually in the same composition as
12 is reflected in that exhibit at the time that it was
13 produced from this plant for this pit?
14 MR. WOTRING: I would ask the expert
15 whether they're the same, before moving back into the
16 document, is how I would handle it.
17 THE COURT: Well, I need to know what he's
18 basing that on so I can address the foundation
19 objection. So let's bring Dr. Pardue in, and I'm going
20 to let you ask him that outside the presence of the
21 jury.
22 MS. GRAY: Maybe while he's coming in, Your
23 Honor, this is one of the documents that was to be
24 redacted for the black liquor reference on the fourth
25 page. I'm just asking --

1 MR. MUIR: It has been.
2 THE COURT: It has been.
3 MS. GRAY: I appreciate it.
4 MR. SCHRADER: Is that okay, the way -- the
5 way to handle an issue?
6 THE COURT: Yes. That was actually fine.
7 That was fine.
8 MR. SCHRADER: Thank you.
9 (Dr. Pardue re-takes the stand and the
10 following proceedings were had outside the presence of
11 the jury).
12 THE COURT: Doctor, if you could come back
13 up to the stand for a minute, Mr. Wotring is just going
14 to ask you a few questions outside the presence of the
15 jury.
16 You may proceed, Mr. Wotring.
17 Q. (By Mr. Wotring) Dr. Pardue, do you have
18 Exhibit 43 in front of you?
19 A. I do.
20 Q. And you've got test results there that we just
21 discussed from the stand?
22 A. Yes.
23 Q. On Page 2 of Exhibit 43, correct?
24 A. Yes.
25 Q. And are those test results -- you've also seen

1 test results of the sludge from the plant in the
2 1964/1965 time period?
3 A. Yes.
4 Q. Are the testing results on Page 2 of Exhibit
5 No. 43 similar to the testing results that you see later
6 on, 10 years later, from the sludge at the Pasadena
7 plant - or at the impoundments? Pardon me.
8 A. At the impoundments or at the plant itself?
9 Q. First at the plant, itself.
10 A. Yeah. The moisture content is -- is -- is the
11 same. That carries throughout. These other tests, the
12 volatile matter and some of the fertilizer wasn't
13 repeated during that period. So I don't have any other
14 data -- I don't have that data.
15 Q. So the only test results that you have that you
16 compare from then in 1955 with 1965 is the moisture
17 content?
18 A. Right.
19 Q. Okay.
20 THE COURT: Okay. Any objection to that
21 testimony?
22 MR. SCHRADER: No.
23 THE COURT: All right. Doctor, you may
24 stay there and we'll bring the jury back in.
25 MS. GRAY: Your Honor, so we don't have --

1 I'm not asking for a preview, but is there going to be
2 further lines of questions that the sludge that was
3 taken, you know, to the impoundment in 1965 was the same
4 as the sludge that was produced in 1947, as reflected in
5 this? Because I think that we should then also make
6 certain that there is a foundation for those. If it's
7 just the water content, we're good.
8 THE COURT: My understanding is, based on
9 Dr. Pardue's testimony right then, comparing the two
10 testing results, he's only going to be talking in terms
11 of similarity about the moisture content.
12 MS. GRAY: I just wanted to confirm that's
13 what Mr. Wotring --
14 THE COURT: Is that correct, Mr. Wotring?
15 MR. WOTRING: Yes, it's the moisture
16 content.
17 THE COURT: Then I think we're good. We'll
18 get them lined up.
19 (Jury present)
20 THE COURT: Please be seated. You may
21 continue, Mr. Wotring.
22 MR. WOTRING: Thank you.
23 Q. (By Mr. Wotring) We were looking at --
24 MR. WOTRING: Pull up the second page of
25 Exhibit No. 43 and scroll down a little bit.

Q. (By Mr. Wotring) Okay. What was the test results from 1955 with respect to the solid moisture content of the sludge? Where do you look on this sheet for that information?

MR. SCHRADER: Objection to the question. I think I can clarify it for him. It's the date, 1957, right?

THE COURT: They are referring to the date in the document.

MR. WOTRING: Oh, okay.

Q. (By Mr. Wotring) If you look at the top, it has got the test results from 1947, correct?

A. That only applies to this data. This sentence says, "Tests conducted recently in our own lab on dry sludge gave the following results."

Q. So that's where you got the information about the moisture content from the sludge?

A. Right, uh-huh.

Q. I may have messed that up. We'll go to the top of that page and move on. So which test results came from 1947 at Texas A&M?

A. This right here (indicating).

Q. And which test results came from their own lab?

A. Everything below this line (indicating).

Q. So if we want to know how much water is in our

1 sludge, which portion of this do we look at?
2 A. This line right here (indicating).
3 Q. All right. Let's go through that again.
4 What -- what is the -- the solid moisture content in the
5 sludge, based upon the review of Exhibit No. 43, the
6 September 21st, 1955 letter that we're looking at?
7 A. It's 93 percent water and 7 percent solids.
8 Q. Then what does it say happens next? Well, let
9 me ask you this: Is that similar -- is their test
10 results from 1955 about the water content of the sludge
11 that went into the impoundments?
12 A. The -- all of these numbers, the 7 percent, the
13 63 percent, are repeated -- repeatedly used in the
14 calculations to apply the -- you know, how much -- how
15 big of a barge do we would need, how much water needs to
16 be applied. So all of that is used in the calculations
17 of the sludge amounts moving to the impoundments in
18 question.
19 Q. I see. So in the documents about moving the
20 sludge to the impoundments we're here about, they use
21 the figure that we're looking at from this document?
22 A. Correct. I'm not sure if it's from this
23 document or just the number is always the same, but
24 those numbers are the same.
25 Q. What does it mean when something is 7 percent

solid and something is 93 percent moisture?

A. It's very wet. It's mostly water.

Q. Let's say -- what's -- anything similar to Jell-O? What would Jell-O be?

A. I don't know. Jell-O is a gelatin, so it's interlinked. So it's probably not a good --

Q. It's a different thing?

A. -- not a good different thing.

Q. What does it say happens if you use vacuum filtration?

A. That takes it from 93 percent water to 56 percent water.

Q. And what is vacuum filtration?

A. It's a pump that pulls a vacuum through a sample and pulls the water out of it.

Q. Now look at the last line there on that paragraph that we're looking at. What happens if you throw sludge out on the ground and let it stand, according to this document?

A. It reaches an average moisture content of 47 percent.

Q. Okay. So that says, "Sludge thrown out upon the ground and allowed to stand in shallow layers for two or three years reaches an average moisture content of 47 percent" right?

A. Correct.
Q. Okay. What -- how -- what is just mud?
A. Mud might be 60 percent water, 65 percent water.
Q. And then go back up a sentence. What happens if you -- the second sentence says, "This compares with a drop of 93 percent to 63 percent by holding the sludge in the sludge storage basins." Is that a figure that's also used in the later calculations about how to barge the stuff off the plant?
A. Yes.
Q. All right. So we're looking at, real roughly, this may not be -- is this the moisture content of kind of mud?
A. Kind of mud, but this is a fibrous material, so it presents a little bit differently than mud does.
Q. I see.
A. It's probably a little bit more wet cardboard or wet paper than mud.
Q. And so the figures we see in 1955 are the figures that are -- the same numbers are used later when they're calculating how much sludge to move off -- off the plant and into the site?
A. Correct.
Q. All right. And you have looked at testing from

1 actually the impoundments we're here to talk about,
2 right?
3 A. Yes.
4 Q. And let me --
5 MR. WOTRING: If we could pull up the first
6 page of Exhibit No. 858, which references IP 2353 (sic).
7 Your Honor, may I approach?
8 THE COURT: Yes.
9 Q. (By Mr. Wotring) Now what are we looking at?
10 A. These are test results that the Texas Board of
11 Health did during an investigation of waste disposal
12 practices in the pits.
13 Q. Okay. And what kind of tests did they do?
14 A. Well, just -- these are just general chemical
15 characteristics of the material, specifically the water
16 that was floating above the sludge.
17 Q. I see. And what was significant about these
18 test results in your analysis in this case?
19 A. Well, this explains why the -- what was known
20 at the time about these materials, why it had to be
21 contained. This BOD term is called Biochemical Oxygen
22 Demand. It basically measures how much oxygen is needed
23 to take that organic waste and break it down.
24 So a high number like that -- sewage, raw
25 sewage from a pipe, you know, from a municipal sewage is

about 2 to 300. So this is, you know, several times that, in some cases 10 times that. So this is a very organic material that if you put it in a water body, would suck all the oxygen out of that water body. The bacteria would break it down and all the oxygen would disappear, and that would cause a fish kill in the aquatic system.

Q. And we're not talking about -- it sounds simple, but the stuff we're talking about that went into the impoundments, we're not talking about domestic sewage, are we?

A. No. It's an industrial waste.

Q. Industrial waste.

A. Right.

Q. And it's a product of the paper mill process and it's an industrial waste product?

A. Yeah, just wood fibers that are organic, right.

Q. I see. And what else is significant about Exhibit No. 858 that you used in formulating your opinions in this case?

A. Just to show the oxygen effect. They never measured any oxygen in the water, which is consistent with the testing. There are a lot of solids there, as well. That's, again, a level that would be above which one could discharge. And these are the sort of

guidelines over here about that.

The other thing of note here is the color. So this is a measure of how colored the water is. So water from paper mills tends to have a real strong color, brown or black. So these are very high numbers that would be reflective of very colored water.

Q. And this test result is from one of the impoundments we are talking about?

A. Correct.

Q. And which impoundment number are we talking about?

A. The -- this is the upper pond. So this is Pond 1 in our -- in our diagram.

Q. Maybe we can go back to Exhibit No. 31. Which pond is that?

A. It's this one (indicating).

Q. All right. And then if we could go back to our Exhibit No. 858, there is Page 2, which is IP 2354. Which pond are we talking about here?

A. This was somewhere taken in what is called a lower pond, which is either Pond 2 or Pond 3.

Q. There is some -- is there some uncertainty in the documents about when Pond 2 and Pond 3 were constructed?

A. Yes.

Q. Okay. How would you compare the testing results from this, generally, if it can be done? Let me ask that first. Can you compare these test results generally with the test results from the other pond?

A. Yes. They're the same test and same lab. So these -- these, again, are very high elevated oxygen demand numbers, very high solids, no oxygen, high color.

Q. So if there is no dissolved oxygen in the water inside the impoundments, could fish swim in it?

A. No.

Q. And I believe that the examination -- these test results we've been talking about are part of the Texas State Department of Health investigation done on this site, correct?

A. That's correct.

Q. And that is Exhibit No. 861, which I believe is preadmitted. And do you have a copy of that?

A. I do not.

Q. Let me hand you a copy of Exhibit No. 861. Just real generally, the test results we just looked at came from the investigation that was done. And are they part of Exhibit No. 861?

A. They are.

Q. Okay. And are they part of the attachments to Exhibit No. 861?

A. They are part of the table on one of the later pages.

Q. Okay. So that's where that information came from that you have about the water in the impoundments?

A. Correct.

Q. 861 has other information that you used in your opinions; is that right?

A. It does.

Q. Okay. What other information does Exhibit No. 861 have that you used in formulating your opinions in this case?

A. On the first page there is some general information that describes the process by which the sludge was moved from Champion to the waste pits.

Q. Okay. Let's go down to that paragraph "General," stop there, and let's look at that. This says, "This investigation covered the present practice of disposal of settled solids from the Champion Paper processes, a practice which is carried out by McGinnis Industrial Maintenance Corporation," right?

A. Yes, yes.

Q. What else did you use in this paragraph in formulating your opinions in this matter?

A. The dates were key. The -- it says here, "This operation has been carried out since approximately

1 year ago with the first operation begun in June of 1965. This work was done by the Ole Peterson Construction Company with the McGinnis Corp taking over and beginning operation on September 13th, 1965."

Q. Now, why was that -- why was that time period significant to you in formulating your opinions?

A. The -- the sludge dates -- the sludge amounts had dates associated with when things were moved from which basin on the plant. So these dates confirm when they started loading into one group of pits versus another. So this allowed me to sort of sort the material into where it finally went ultimately -- where it was ultimately disposed.

Q. Okay. Is there anything important in the second paragraph of No. 861, the Texas State Department of Health investigation, that was significant to you in formulating your opinions in this case?

A. Yeah. This describes the process. So while I think I understood the process from other documents, it confirms the process that was -- that was undertaken then.

Q. Okay. Anything else about Exhibit No. 861 that you used in formulating your opinions?

A. It also has the amounts on the second page.

Q. If we could turn to the second page of Exhibit

1 No. 861, and which paragraph are you looking at?
2 A. I'm looking at the -- down here, the quantity
3 (indicating). I'm sorry. There we go. So this is the
4 135,000 cubic yards of material, kind of the upper bound
5 of what we think went into the impoundments.
6 Q. Let's read that, then. "It was established by
7 Mr. Henderson that complete cleaning of the two ponds
8 would result in the removal of 135,000 cubic yards of
9 material," right?
10 A. Yes.
11 Q. And is that consistent with your analysis of
12 the records of this case about how much material was
13 placed in the impoundments?
14 A. Yes, it is.
15 Q. Okay. And from your review of this document
16 and other documents, did you formulate an opinion about
17 whether waste sludge material went into what we've been
18 calling Impoundments 1, 2 and 3?
19 A. Yes.
20 Q. And what is your opinion on that, Dr. Pardue?
21 A. Yes, that each of those three pits were filled
22 with waste material, with sludge mixed with water.
23 Q. And when you say "sludge mixed with water" for
24 each one of the three pits, do you have information from
25 your review of the documents in this case about the --

1 the percentage of solids and water in the sludge that
2 was placed in all three of those impoundments?
3 A. Well, it was about two-and-a-half parts water
4 were mixed with one part of the sludge. And that was --
5 water was needed to mix it to make it palpable. So it
6 was kind of more -- it was mostly water, but it was more
7 solid. So you couldn't get it to the barge unless you
8 mix it with water again and then ran it through a pump.
9 Q. So what they did at the plant was they had
10 described the process of getting the sludge out of the
11 plant and into first the barge that went to the
12 impoundments?
13 A. They had a source of water, and they would jet
14 that water in, mix that with the solid material that
15 were in these basins -- think of sort of an excavation,
16 sort of slowly mixing -- they had a pond area, mixing
17 that together and then pumping that with a dredge pump
18 into a barge that was adjacent to the plant in the
19 Houston Ship Channel.
20 Q. Then when they got from the barge -- barged it
21 to the impoundments, how did they get it off of the
22 barge into the impoundment, itself?
23 A. So they had the same kind of a dredge pump.
24 It's a 10-mile boat ride. You would put the dredge pump
25 down into the barge and pump it into the impoundments

1 that way.
2 Q. One further point on Exhibit No. 861 before we
3 move on. And you've reviewed 861 in connection with
4 your work in this case?
5 A. Yes.
6 Q. Okay. Does 861 have -- does it discuss whether
7 McGinnis and/or Champion would need permission from any
8 government entity before pumping water out of the
9 impoundments?
10 A. Yes. It tells them not to pump water out of
11 the impoundments and discharge that into any water body.
12 Q. And on what page of Exhibit No. 861 is that
13 statement located?
14 A. I'll find it.
15 MR. WOTRING: Your Honor, can we approach?
16 THE COURT: Yes.
17 (After a bench discussion outside the
18 hearing of the reporter and jury, the following
19 proceedings were had:)
20 Q. (By Mr. Wotring) My apologies, Doctor.
21 Where on the State Department of Health
22 document do you see any information about whether the
23 McGinnis and Champion needed permission before
24 discharging into the river?
25 A. It's on the last page.

Q. Okay. Let's go to the last page.
A. The last text page. I'm sorry.
MR. WOTRING: It's 4024.
Q. The last two paragraphs?
A. Yes.
MR. WOTRING: If you could pull up the last two paragraphs.
Q. And where do you see statements regarding whether they needed permission before discharging into the river?
A. Well, they're talking about getting a permit application to do that because they were -- it was very uneconomical to take the water back to the plant.
Q. All right. Let's walk down and walk through this document?
MS. GRAY: Objection, Your Honor. May we approach?
THE COURT: Yes.
(After a bench discussion outside the hearing of the reporter and jury, the following proceedings were had:)
MR. WOTRING: Brian, would you go ahead and take it down?
THE COURT: Ladies and gentlemen, we're going to take a quick break. Y'all take this as a

1 restroom break because we're going to take a little
2 longer before lunch.
3 (Jury not present)
4 THE COURT: The reason I -- please be
5 seated.
6 The reason I decided to take a break is
7 when we're talking about prior agreements or not prior
8 agreements, I think it's better to do that without the
9 jury present, because you-all have different
10 recollections of what you agreed to on exhibits and we
11 need to be able to talk about that freely and not have
12 the jury here.
13 MR. WOTRING: By way of short-circuiting a
14 lot of argument, I know the Court is familiar with this
15 document and I'll just present it to the Court and the
16 Court can make a decision about whether it's the
17 southern impoundments or the ongoing operations.
18 THE COURT: Actually, first, I think is the
19 question about whether or not there was an agreement to
20 redact portions of it.
21 MR. WOTRING: There is clearly redaction
22 about the southern impoundments. We're now having a
23 dispute about whether this is the southern impoundment.
24 MS. HINTON: Your Honor, I can clear this
25 up, I think. I think I can straighten this out. And I

1 think that Harris County is attempting to cause great
2 confusion. They have redacted items in two exhibits
3 when it suits their purpose and they've left things in
4 when it doesn't. The ruling of the Court is clear that
5 the southern impoundment is not to be dealt with in this
6 case.
7 THE COURT: Actually, that was an agreement
8 of the parties.
9 MS. HINTON: An agreement or that we were
10 only dealing with the impoundment -- the site that's at
11 issue here.
12 THE COURT: Yes, ma'am.
13 MS. HINTON: With respect to 858, Your
14 Honor, I would point out that on the third page of that
15 instrument is also testing results relating to the
16 southern impoundment that shouldn't be dealt with, as
17 well as another page in here relating to the southern
18 impoundment. They did redact the picture that showed
19 the southern impoundment, but they did not remove the
20 testing results and comments.
21 I'm not going to -- next on Exhibit
22 No. 17, I have the version that was taken to the Meet
23 and Confer and the discussion here. This document, it's
24 undisputed, deals with the northern impoundment and the
25 southern impoundment and where McGinnis was attempting

1 to get a permit to pump water off the southern
2 impoundment on behalf of the landowner there.
3 THE COURT: Right. Now it seems to be
4 clear from the documents that were admitted, if that's
5 Plaintiff's 17, there is a note it is to be redacted as
6 to other sites.
7 MS. HINTON: And it is not redacted as to
8 other sites, Your Honor. On the second page of this
9 document it also has left in -- it's, once again,
10 partially redacted to suit their purposes. On the
11 second page of that instrument, the next-to-the-bottom
12 paragraph refers clearly to the southern impoundments,
13 about them being nearly full at this point in time.
14 Mr. Muir, you'll get a chance to speak.
15 The next page, Your Honor, also shows the
16 highlighting that relates -- that we discussed with them
17 about the people on the southern impoundment and
18 discharging water for the southern impoundment, which
19 this related to.
20 In addition, it refers specifically to the
21 old pond south of Highway 73 and samples from that.
22 And this last page here, Your Honor, that
23 they were just attempting to question the witness about,
24 discussing "did you need permission to remove water" is
25 all about the southern impoundment. It is not about the

1 site at issue in this lawsuit.
2 I would request that this document be
3 stricken from the record in light of counsel's misuse of
4 it with this witness. So that document is Plaintiff's
5 Trial Exhibit No. 861, as well as Defendants' Exhibit
6 No. 17 as used by the plaintiff, for their misuse -- I'm
7 sorry -- as well as Plaintiffs' Trial Exhibit No. 858,
8 in light of their misuse of those documents and in
9 accordance with the agreement and the rulings of this
10 Court.
11 THE COURT: 858 and 861 were admitted as
12 redacted. So the discussion is about whether or not
13 it's been redacted properly with regard to the southern
14 impoundment.
15 MR. WOTRING: Well, with regard to the
16 testing results, the only pages that were displayed were
17 of northern impoundments. That's the only thing the
18 jury has seen. So if there is a dispute about other
19 pages, that has not been published to the jury.
20 THE COURT: Okay.
21 MR. MUIR: The first page of the document,
22 which is completely gone, was the test results for the
23 southern impoundment.
24 THE COURT: Okay.
25 MS. HINTON: Here is a test result of the

1 southern impoundment.
2 MR. MUIR: This is --
3 MS. HINTON: The southern impoundment.
4 MR. MUIR: -- it is --
5 MS. HINTON: I'll explain it to you.
6 THE COURT: Just a moment.
7 MR. WOTRING: Can I put the witness on the
8 stand and lay a foundation?
9 THE COURT: Let me hear your argument first
10 as to what you think, of those documents that Ms. Hinton
11 just referenced, if you think it's not related to the
12 southern impoundment, tell me what part you think is not
13 related to the southern impoundment, of the portions
14 that she referenced.
15 MR. WOTRING: On the two pages we showed to
16 the jury, and the only two that I published to the jury,
17 those are the northern impoundments. The third page
18 she's talking about of discharges into the river --
19 THE COURT: Are you planning on showing the
20 third page to Dr. Pardue?
21 MR. WOTRING: No.
22 THE COURT: Then we'll address that
23 separately. All right. I think that's all on that
24 document. Let's move on to the other document.
25 MR. WOTRING: The other document, the last

1 page is talking about permission to discharge in -- from
2 the impoundments. And that was the predicate I laid
3 with the witness prior to asking the question and prior
4 to moving to that page, was from these -- I defined the
5 impoundments based upon Exhibit No. 31. I clarified
6 that. I can't say "as opposed to the southern
7 impoundment," so I have not done that.
8 THE COURT: I understand.
9 MR. WOTRING: So we defined the
10 impoundments, and I asked the question: "Is there
11 information in this about getting permission to
12 discharge from the impoundments?"
13 He said "Yes."
14 "Where would you find that?
15 "It would be on the third page."
16 I would like the record to reflect, because
17 it can, that I'm proceeding very slowly in my
18 questioning of the witnesses and trying to move
19 deliberately through these documents to avoid these
20 kinds of charges, which I think are unfounded.
21 And I think that the witness has already
22 answered the foundational question, which is that these
23 two paragraphs -- and for the record, we're talking
24 about Plaintiff's Trial Exhibit No. 861, and that is
25 MIMC HC4024, the two paragraphs that were displayed

1 briefly for the -- for the jury, refer to the
2 impoundments which are the northern, not to southern
3 impoundments.
4 THE COURT: Let me see the document.
5 MR. WOTRING: Absolutely. Wait just a
6 second. Let me let Mr. Muir respond.
7 MR. MUIR: In further support of that, Your
8 Honor, the discussion about excess water and its
9 disposal that is included, that they didn't claim was
10 part of the southern impoundment, talks about the fact
11 that it is very uneconomical for McGinnis to haul the
12 water back. So they would like to discharge it
13 directly. Actually, that's what was happening in
14 December of 1965, they were discharging directly the
15 water from those impoundments.
16 MS. HINTON: There is no evidence of that,
17 Your Honor.
18 THE COURT: Just a moment. Let Mr. Muir
19 finish.
20 MR. MUIR: The black liquor, that has been
21 excluded, but not from the Court. This discussion is
22 about why they want to be able to discharge it. If you
23 look at the last page, it talks about the test results
24 that are being done and that they aren't going to go for
25 an attempted permit until they get these test results

1 back, the majority of which are test results on Page 3.
2 The ones that are remaining are all test results for the
3 New Pond 2, new Pond 1, and the San Jacinto River, which
4 is -- which is Page 3 of Exhibit 858, which counsel has
5 mistakenly accused us of leaving in as part of the
6 southern impoundments.
7 The southern -- south of Highway 10
8 document, the page of 858 which had the results for the
9 pits south of Highway 10, was an entire page, that was
10 the first page of the document, and it has been removed
11 entirely. If you look at the page that they're claiming
12 to be southern impoundment, it says "characteristics of
13 San Jacinto River water."
14 MS. HINTON: I apologize, then. If it is
15 the San Jacinto River, then it is, Your Honor, but --
16 THE COURT: You can't talk at the same
17 time.
18 Mr. Muir, you were saying. Then I'll let
19 Ms. Hinton respond.
20 MR. MUIR: If you look at the exhibit which
21 is 861 --
22 THE COURT: And I am on Page 3.
23 MR. MUIR: -- on Page 3 there is a
24 discussion of the excess water.
25 THE COURT: Yes, sir.

1 MR. MUIR: You have results for new Pond 2,
2 new Pond 1, which are clearly and undisputed the
3 northern impoundments, and for number 3, which is
4 San Jacinto River near barging pit -- point --
5 THE COURT: Let me stop you there. I think
6 Ms. Hinton is saying she agrees with you on that.
7 MS. HINTON: I do agree. However, it also
8 has references on the old pond. And the issue --
9 THE COURT: Where do you think the
10 references to the old pond start? And then I'll let
11 Mr. Muir address that.
12 MS. HINTON: I think he's redacted a
13 portion of it, but I want to focus on the date of this
14 document, too, is May 1966, when moving materials to the
15 northern impoundment ceased. This permit application
16 relates to removing water and to issues relating to
17 Hall's Bayou. This permit application has nothing to do
18 with removing waters from the northern impoundment
19 that's at issue in this case.
20 Activities had ceased in May of 1966 at the
21 northern impoundment, and this was a permit process and
22 an application relating to removing waters off the
23 material.
24 MR. MUIR: This is April.
25 THE COURT: Finish your sentence, please.

1 MS. HINTON: It's stamped "May of 1966."
2 THE COURT: Yes, ma'am.
3 MS. HINTON: So there is discussion in here
4 in addition, Your Honor, of this no dispute of the
5 southern impoundment, wanting to remove waters off of
6 it, the seeking of a permit, characteristics, and the
7 southern impoundment issue should not be addressed.
8 There is no evidence in this case, and this document
9 does not reflect in any way that Mr. McGinnis was
10 seeking a permit to remove waters off the northern
11 impoundment.
12 At this point in time, also, as the Court
13 is aware, there were activities going on relating to the
14 Hall's Bayou site. This is a very misleading document.
15 It is prejudicial. It has not been properly redacted.
16 And we would request that counsel, if it intends to use
17 redacted documents, which we thought we had an
18 agreement, and our records reflect that that last page
19 was supposed to have been deleted, that they be given to
20 us before they are handed to the witness and we have
21 ample time to review the redactions.
22 THE COURT: Okay. So the question for you,
23 Mr. Wotring, is: What is the evidence in this case that
24 there was any permit sought for removal of water from
25 the northern impoundments in May of 1966?

MR. WOTRING: That's what this whole discussion --

THE COURT: Well, they're arguing that it's related to Hall's Bayou.

MR. WOTRING: Hall's Bayou is not addressed in this at all. This is the follow-up to the December -- we believe the follow-up to the December black liquor pumping episode. It's an investigation that was done on April 22nd, 1966, and Hall's Bayou was not done until July -- excuse me -- until August of 1966. I mean, you can read the two pages, Your Honor. And the witness has already testified that these are relating to the southern impoundments --

MR. MUIR: You mean the northern impoundments.

MR. WOTRING: -- I'm sorry, the northern impoundments --

MS. HINTON: My point exactly, Your Honor, another impoundment.

THE COURT: I understand from the witness. Right now I'm talking about the document. So separate and apart from Dr. Pardue, I need you to show me how you think Page 4, which is what I think it is, is referencing the northern impoundments, as opposed to the southern impoundment.

1 MR. WOTRING: Because it says this --
2 THE COURT: Tell me where you are.
3 MR. WOTRING: I'm on Paragraph No. 1.
4 THE COURT: Where it reads "this type of
5 waste"?
6 MR. WOTRING: It says, "It appears that
7 several things are to be considered in this matter."
8 Okay. First of all, let's go back. I'm looking at
9 paragraph -- or Page MIMC 4214 of Exhibit No. 861.
10 THE COURT: Yes, sir.
11 MR. WOTRING: It says "Officials of both
12 companies were most anxious to work something out
13 regarding this method of waste disposal." "This method
14 of waste disposal" is talking about the existing
15 northern impoundments. That's from the first page. We
16 know that because it says on the first page that --
17 THE COURT: "The present practice of
18 disposal of settled solids from the Champion Paper
19 processes."
20 MR. WOTRING: "This practice consists of
21 the removal," and it has that sentence.
22 THE COURT: Off the record. Let me read
23 this.
24 (Whereupon, after a bench discussion
25 outside the hearing of the reporter and jury, the

following proceedings were had:)

THE COURT: Ms. Hinton, obviously on Page 4213, you agree that the portion under "Excess Water & Its Disposal" above where it's redacted does relate to the northern impoundment?

MS. HINTON: I have to look at the redacted version, Your Honor.

THE COURT: So currently what I have asked Ms. Hinton is -- we're looking at Page 4213. We are under the paragraph that reads "Excess Water & Its Disposal," and we're above the portion that's redacted. My question to her was: Does -- doesn't this relate to the northern impoundment? It's talking about the current practice of taking the water back on the barges. And I think it does. I'm just confirming that with you.

MS. HINTON: I think it does, Your Honor. However, the date is odd. It's the -- the dates off. That's why I think they're talking more generally about could they do permitting for discharge of water, because at this point in time there is no dispute in May of 1966 operations had finished. And it -- the materials were there in May of 1966. They talk about the -- you are right, the redacted part talks about the older area.

THE COURT: Let me keep reading.

MR. MUIR: Your Honor, if we can address

1 one thing? This is an investigation report -- a report
2 about an investigation on April 22nd.
3 THE COURT: From a previous time.
4 MR. MUIR: This is an April 22nd
5 investigation. And they're talking about the pits being
6 almost full, which the -- if you look at --
7 THE COURT: I understand your point --
8 MR. MUIR: -- 858, it goes --
9 THE COURT: -- that this is an
10 investigation from April.
11 MR. BENEDICT: Your Honor --
12 THE COURT: Just a second. Mr. Benedict.
13 MR. BENEDICT: I was going to say,
14 regardless of which pit it's referring to, it does
15 establish knowledge. They admit they needed a permit to
16 discharge to the river.
17 THE COURT: Let me ask you a question that
18 occurred to me during this whole line of questioning.
19 Is that really an issue in this case?
20 MR. WOTRING: They have stood up again in
21 opening and said, "We never needed a permit to do
22 anything, to discharge. We did everything right. We
23 did everything" --
24 THE COURT: Oh, okay. I don't think that's
25 what they said. I think what they said is, "We didn't

1 need a permit to put this waste in this impoundment and
2 because people could do those things back then; and,
3 yet, we got permission, so to speak, by the way we went
4 about it." I don't think anybody has suggested that
5 these companies say they could have discharged the waste
6 directly into the river and that would have been fine.
7 Now, I do understand one of the things
8 you're going to refer to, and maybe that's something
9 that can be cleared up. You're going to refer to the
10 fact that Mr. Carter, in his opening, talked about it
11 being the "wild west" and that people were discharging
12 everywhere and that was all okay because there was no
13 permitting. I understood your point about that.
14 MR. WOTRING: Yes.
15 THE COURT: I think that can be clarified,
16 because the point I think they were trying to make in
17 the opening was that they didn't need a permit to
18 dispose of this waste in the impoundments. No one is
19 trying to suggest that it would have been okay and there
20 was no permit required for them to discharge directly
21 into the river.
22 MR. WOTRING: Unfortunately, that's what
23 was suggested in opening.
24 MR. CARTER: It was not.
25 THE COURT: But even if one could take that

1 as a potential reading of the opening, that's something
2 that can be clarified by an instruction, a stipulation.
3 I don't think that means that we need to have
4 questioning with an expert about an issue that's not in
5 dispute in this trial, that potentially is causing
6 you-all to spend a lot of time arguing about whether or
7 not we are talking about the southern or the northern
8 impoundment. And no one is suggesting that they should
9 have been able to discharge it directly into the river
10 in this trial.
11 The issue in this trial is it was okay to
12 put it in the impoundments. You-all have said that.
13 They have said that. What is not okay is for it to get
14 out of the impoundments near or in the river.
15 MR. WOTRING: What do I do to respond to
16 statements from counsel that it was the "wild west" and
17 people were doing anything they wanted at that time.
18 THE COURT: We either give an instruction
19 or we have a stipulation. That's how we address it.
20 MR. CARTER: We didn't have an objection at
21 the time, if there was some concern about what was being
22 said, so that I could clarify what I meant during the
23 point in time that it was happening. That's --
24 THE COURT: The sensitivity to that is
25 obviously people have a concern about objecting during

1 someone's opening statement. We've talked about
2 addressing things separately in terms of someone has
3 opened the door.
4 What I would suggest on this is I
5 understand why you felt like that was an issue left out
6 there. I think that would have been something good for
7 us to address for the witness, because I think the way
8 that one is cured, if it is a concern, is an instruction
9 or stipulation, because this is a nonissue in this
10 trial.
11 There is no suggestion by -- and shouldn't
12 be any suggestion by any party that it would have been
13 okay for the defendants to discharge their waste
14 directly into the river.
15 MR. WOTRING: I have the reference from
16 opening.
17 THE COURT: No, I remember the.
18 Discussion because I took copious notes.
19 MR. WOTRING: And if objecting is required
20 to preserve the issue, I've already asked the witness
21 did this document require them to get permission before
22 discharging into the river.
23 THE COURT: I understand. We talked about
24 how to handle objections in a sensitive way for all
25 parties' benefits. I don't think anybody has waived

1 anything.
2 MR. WOTRING: Okay.
3 THE COURT: I don't have a problem with the
4 fact that you didn't jump up and object in opening. I
5 also don't have a problem that they didn't jump up and
6 object during Dr. Pardue's testimony in the ways we all
7 talked about we didn't want to do, especially with
8 experts.
9 So my view is, I hear what Harris County is
10 saying on that point. I also understand the defendants'
11 point. My job as the Judge is to decide what is
12 relevant for purposes of this trial. Discharging
13 without a permit is not relevant for purposes of this
14 trial because that is not an issue in this trial, nor is
15 it something that would be okay to do.
16 So I don't care if we do it by a
17 stipulation or an instruction, but I think that's the
18 proper way to address it, rather than go down this
19 rabbit trail with an expert that, one, is a lot of time
20 when y'all are trying to make sure you get this witness
21 on and off and, two, is not an issue in dispute in this
22 case.
23 So how would you-all like to proceed? I
24 can draft an instruction, or you-all can draft with me a
25 stipulation. Which would you prefer?

1 MR. WOTRING: I think it would be easier if
2 the Court were to draft an instruction.
3 THE COURT: Give me 5 minutes and I'll
4 draft an instruction for your review.
5 MS. HINTON: May I also add for the record
6 that to the extent they're attempting to get Dr. Pardue
7 to offer evidence about permitting requirements in the
8 1960's in Texas, he's been -- not been offered as an
9 expert in that regard and he's not qualified to give
10 such testimony.
11 THE COURT: He's not been offered as an
12 expert in that regard. I don't think that's an issue,
13 which is why I think the proper way to address it is
14 with an instruction.
15 MS. HINTON: Thank you, Your Honor.
16 THE COURT: I will be right back.
17 (After a break, the following was had:)
18 THE COURT: I believe this is already
19 admitted in evidence, but just in case, Plaintiffs'
20 Exhibit 1005, which is the survey with the attached
21 aerial photographs, is admitted.
22 MR. WOTRING: Thank you, Your Honor.
23 THE COURT: With that, we can bring in the
24 jury and let Dr. Pardue get back on the stand.
25 (Jury Present)

1 THE COURT: Please be seated. Thank you,
2 ladies and gentlemen, for your patience while we dealt
3 with some exhibits. We're ready to move forward.
4 Mr. Wotring.
5 MR. WOTRING: If we could pull up the first
6 page of Plaintiffs' Exhibit No. 861. We were talking
7 about that document.
8 Q. (BY MR. WOTRING) Do you remember that document,
9 Dr. Pardue?
10 A. Yes, I do.
11 Q. This is the State Department of Health
12 investigation?
13 A. Yes, it is.
14 Q. And it had some information in that that played
15 a role in you formulating your opinions?
16 A. Yes, it did.
17 Q. And I think, if we just highlight the top for a
18 brief minute to orient everybody -- and that's the State
19 Department of Health investigation. There are two dates
20 on it. There is a May time stamp. Do you see that?
21 A. I do.
22 Q. You've got your laser pen. Point that out real
23 quickly.
24 A. (Witness complies).
25 Q. Okay. Then what was -- is that the date the

1 investigation was done?
2 A. May '66.
3 Q. That is when it was stamped. Look at the
4 bottom at the last sentence.
5 A. It was April 22, 1966.
6 Q. Okay. Now, I think that you confirmed the
7 information in this report that you used in formulating
8 your opinions. The stuff that we haven't talked about
9 is at the bottom of Page 2; is that right?
10 A. That's correct.
11 Q. Let's pull up those bottom two paragraphs
12 alone. And why don't you read to us the pertinent
13 information from the bottom two paragraphs.
14 A. "One of the ponds has been filled and the
15 second is nearly full. Levees on the first pond appear
16 to be in good shape, with possibly slight seepage, while
17 the second pond needs additional work on the levees.
18 According to Mr. McGinnis, wet weather has prohibited
19 the proper completion of the levees and additional work
20 is to be done as soon as possible."
21 Q. Okay. Now, what -- what's pertinent or
22 important about that information in the first paragraph
23 for you in forming your opinions in this case?
24 A. Two issues. One, that the ponds were filled
25 during this period; and since I independently calculated

1 that they would be filled by the amount of waste that
2 was moved, this was confirmation of my calculations.
3 Q. That's right. Because remind us again, what
4 did you do in this case? What was your work?
5 A. It really was develop a timeline and understand
6 how the waste was moved from the plant to the pits, and
7 then to opine on the mechanisms by which dioxin left the
8 pits and got into the river.
9 Q. Now, we've heard a little bit about the first
10 opinion. Do you have an opinion on the second issue?
11 A. Yes.
12 Q. What's that opinion?
13 A. It's my opinion that the dioxin did leave the
14 impoundments starting in 1973 and going to the end of
15 the penalty period on a daily basis.
16 Q. Okay. And briefly, because we'll get into it
17 in more detail, do you have an opinion on what
18 mechanisms were in place during the period of time we're
19 talking about for the dioxin to get out of the
20 impoundments and into the San Jacinto River?
21 A. Well, during this time tidal water was getting
22 into the impoundments, so there was a break in the levee
23 that allowed the water to get in. At some point in time
24 the whole impoundment was completely submerged. So
25 three mechanisms. Water would come along and just pull

1 the particles off and those particles would leave from
2 the waste pits because there wasn't any containment any
3 more because of the issues that I just mentioned.
4 And the second thing is just the fact that
5 there was dioxin-contaminated water, that included water
6 and colloids, small particles, and whenever that water
7 would come in on a daily basis, or when it was
8 completely submerged and the river was flowing over it,
9 that provided another way for dioxin to be released and
10 get into the river.
11 Q. What is a colloid?
12 A. It's a very small particle. If you have ever
13 looked at natural water and seen a yellow or brown color
14 and it's clear, that's what it is. It is a particle --
15 it's really too small to be seen by the eye; but it will
16 generally impart a color to the water. So dioxin wants
17 to get out of the water so badly it will tend to attach
18 onto those small particles. Many compounds do this, and
19 that allows them to be transported more easily.
20 Q. Okay. If I take water out of the San Jacinto
21 River or any other river and I hold it up and I see
22 little bits of stuff on it, is that colloids? Can I see
23 it?
24 A. No, you can't see.
25 Q. What am I looking at when I hold the water up

1 to the light?
2 A. Those are settleable particles that you see if
3 you -- if you can visibly see particles, they would
4 settle.
5 Q. So you are talking about two different things:
6 Settleable solids --
7 A. Right.
8 Q. -- and colloids, right?
9 A. Correct.
10 Q. Those are two different things?
11 A. Two different things.
12 Q. How do they compare in size?
13 A. One is hundreds of times the other. A colloid
14 is a couple of microns and smaller. It's impossible to
15 see.
16 Q. If I go get a vial out of the river, I hold it
17 up, I see stuff in there and it's floating around,
18 that's settleable solids, right?
19 A. Right.
20 Q. That's a hundred times bigger than the
21 colloids?
22 A. Well, it can be many thousands of times bigger,
23 depending on the size of the particle.
24 Q. So it can be a lot bigger, depending upon the
25 size of the particle and the size of the colloid?

1 A. Yes.
2 Q. But, in general, if you have a settleable
3 solid, it's big; if you have a colloid, it's really
4 small?
5 A. Yes.
6 Q. In comparison to the two?
7 A. Yes. And a colloid, you could leave it forever
8 and it would never settle.
9 Q. Let me show you something else. This is, I
10 think, Page 1 of a document that's in evidence,
11 Exhibit No. 1005. Are you familiar with this document?
12 A. Yes.
13 Q. This is not going to work. What is this
14 document?
15 A. It is a survey of the area around the
16 San Jacinto waste pits that I reviewed in making my
17 opinion.
18 MR. WOTRING: Your Honor, is it all right
19 if I come over here?
20 THE COURT: Yes, sir.
21 Q. (By Mr. Wotring) Okay. Tell us again what this
22 is?
23 MR. STANFIELD: Can we pull the easel out,
24 Your Honor?
25 THE COURT: Yes. Do you want to use that

easel that was used for the other big poster?

MR. WOTRING: Sure. I should have brought that out before, but yeah.

Q. (By Mr. Wotring) While we are doing that, what is this?

A. It is a survey, a plat, a survey plat.

Q. And do you use survey plats in your work as an environmental engineer?

A. Yes.

Q. And what kind of information do you get from a survey plat?

A. You get elevations and you get, you know, actual land areas. Property ownership is established by these types of documents.

MR. WOTRING: Your Honor, is it all right if I ask Dr. Pardue to stand down and point out some things on that?

THE COURT: Yes, absolutely. You may stand down, sir.

Q. (By Mr. Wotring) Tell us what you are looking at on that first page on Exhibit No. 1005. Where is the site?

A. The site is here (indicating).

Q. Okay. And where is I-10 on that first page of 1005?

1 A. It's this -- well, at present, it's this road
2 right here (indicating).
3 Q. And what role did this survey play in you
4 forming your opinions in this matter?
5 A. Well, a key time frame is when the pits
6 actually submerged beneath the river, because in that
7 case, certainly every day dioxin was leaving the waste
8 pits. This was a survey that was done for some other
9 purpose. I don't know the purpose for what it was done,
10 but it was done in 1989. And this is the pits in
11 question (indicating).
12 And, essentially, the two pits that we
13 numbered 2 and 3, which were the most eastern side, you
14 see the surveyor -- the lines that are given here is
15 anything that's above the mean sea level, anything
16 that's -- that doesn't show up here, which is most of
17 Pits 1 and 2, some of Pit 3, is all submerged. So
18 it's -- it's beneath mean sea level. And the surveyor
19 is the one who establishes that.
20 Q. Okay. Can I ask you to stand back for a
21 minute?
22 MR. WOTRING: Brian, could you blow up this
23 portion of that first page?
24 Q. And does that information we're blowing up on
25 the screen have information that you used in forming

1 your opinions in this case?
2 A. It gives the elevation of the mean sea level
3 that was established by this -- by this survey work as
4 being 1.24 feet above sea level. So anything you see
5 here that is in white, bound by these marks, are above
6 1.24 feet; and anything that's below that would be
7 submerged every day by the tides coming up and down are
8 permanently submerged.
9 Q. And what date does it say this survey was?
10 A. Well, this is April through June of 1989.
11 Q. So as of July 1st of 1989, do you have an
12 opinion about whether the portion of the impoundments
13 that we see on the first page of Exhibit No. 1005 were
14 submerged under the San Jacinto River?
15 A. Yes. My opinion is that most of the pit area,
16 certainly Pits 2 and 3, were completely submerged by
17 that time.
18 Q. Okay. I don't want to shoot this -- and did
19 they remain submerged through March 30th of 2008?
20 A. Yes. Every aerial photograph we see, they're
21 underwater.
22 MR. WOTRING: And if we could pull up Page
23 2 of Exhibit 1005, and if we could reorient that.
24 Q. All right. What are we looking at? Is this
25 part of the survey report that's 1005?

A. It is. Essentially, what the surveyor did is take this -- do you see this shape? It looks kind of like a dragon. She just overlaid that over aerial photographs of the pits from different periods of time.

Q. Do you want the pointer?

A. That would be great.

Q. Okay. So what are we looking at in 1964? Show us the property boundaries in 1964.

A. So the property -- well, the property boundaries are this area right here (indicating).

Q. Okay. And what do you see in 1964 -- what is that green outline that's overlaid on the property boundary?

A. That's the 1989, you know, amount that's above mean sea level.

Q. So if you wanted to compare -- qualitatively, not quantitatively -- the amount that was left above the water, depending upon the tides in 1989, how would you say -- what amount of the original land mass is still above the water in 1989, when they did the survey?

A. It looks like about a quarter of it is left, about a quarter of the property, somewhere between a quarter and a third. So four or five acres. This is, again, a 20-acre tract. So it looks like four or five of the acres are still above mean sea level.

Q. And if we could go to the next aerial photograph on Exhibit 1005, and what are we looking at there?

A. So this is 1973. Again, you can see the outline -- the '89 outline. And you can see, again, the water now on the left side, the water around the pits. You start to see the levees starting to kind of fall apart on this side. I'm interpreting this as certainly a lot of water in the pits, as well.

Q. By the way, do you look at aerial photographs as an environmental engineer from time to time?

A. Sure, yeah, or satellite images. Yeah, all of that we do.

Q. Do you have any trouble seeing water on that aerial photograph?

A. No.

Q. Do you have any trouble telling the difference between the water and the land on that aerial photograph?

A. No, I don't.

Q. And 1973 -- is 1973 a date that is important in your opinions in this matter?

A. It is.

Q. Why is that, sir?

A. Because this is the first aerial photograph

that we start to see a break in the levee, and that break is in this area here (indicating). You can blow that up and see that. But that area shows up in many of the later images as being an area here -- I'm washing it out when I flash my light on it.

Q. And that's not the photograph you-all looked at for determining whether there is a breach in 1973?

A. What?

Q. This is not the same aerial photograph you looked at for 1973, is it?

A. Right, right.

Q. And --

MR. WOTRING: So if we can scroll back and go to the next page.

Q. In this aerial photograph, again, it shows us the outline of the property and it shows us what -- the green is outlining what was left in 1989?

A. Right. So by '84 even, you know, a lot of the boundaries, a lot of the pit had eroded away. So even as late as '84, there was a lot of material -- the pit material was just no longer above the waterline.

Q. Okay. And did you get any information in your review of the historical documents about what the paper mill sludge was like in April and May of 1966, what its physical characteristics were like?

1 A. It was a fibrous material. It would stick
2 together. It was wet, so we know it was mostly water.
3 Maybe -- they described it as the consistency of wet
4 cardboard or kind of a cheap eggshell carton, like
5 you've seen recycled cardboard, that kind of material.
6 Q. If we could pull up --
7 MR. WOTRING: Brian, would you go to the
8 first page of our Exhibit No. 861? That's the
9 Department of Health. I'm then going to go to the first
10 paragraph -- not yet. I'm then going to go to the first
11 paragraph of the second page. Let everybody get there
12 or have a chance to get there before you blow anything
13 up.
14 Okay. If you would, blow up the first
15 paragraph, Plaintiffs' Exhibit No. 861.
16 Q. So why don't you read for us what that says,
17 Dr. Pardue?
18 A. This is a section called "Quality of Material
19 Removed." It says, "An analysis of the material was not
20 available, but officials of Champion indicated that the
21 material was neutral in pH, non-toxic, and primarily
22 fibrous. The dried material resembled a cheaper grade
23 of cardboard, such as used in egg cartons, et cetera."
24 Q. Read the last sentence, please.
25 A. "Mr. McGinnis reported that he had used it

1 successfully for matting for his equipment in the
2 disposal site."
3 Q. Okay. It's described there as a cheaper grade
4 of cardboard such as used in egg cartons. Let's talk
5 about egg cartons. We're not talking about today's egg
6 carton made out of that -- what are they made out of?
7 A. Styrofoam.
8 Q. We're not talking about that. We're talking
9 about the old egg cartons, the old cardboard egg
10 cartons, right?
11 A. Right.
12 Q. The old cardboard egg cartons?
13 A. Right.
14 Q. And it's called a cheaper grade of cardboard,
15 right?
16 A. Yes.
17 MR. WOTRING: Brian, can we go back to
18 Exhibit 1005? Can we go back to, I don't know, the last
19 photo we were on? Let's go to 1973 first.
20 Q. Now, would that cheap -- would the paper sludge
21 put in the impoundments, which was described as a
22 cheaper grade of cardboard, do you think that would
23 solidify and become harder or softer over time, if it
24 was in this environment that we're looking at on the
25 screen?

A. Well, my experience with wet cardboard suggests that, you know, once it gets wet, it becomes more vulnerable to breaking apart or to -- certainly to not keeping the integrity of a layer.

Q. And by the way, we now know that the sludge put into these Impoundments 1, 2 and 3 had dioxin, right?

A. Yeah, we know that, right.

Q. And dioxin, as we've heard, is a hazardous substance?

A. It is.

Q. Even if you didn't hear that, you know that from your work in the environmental engineering field?

A. Yes.

Q. So as we see in the documents, the Health Department document then describes it as non-toxic, that's because at that point in time they didn't know about dioxin?

A. That's correct.

Q. All right. Now, if we can keep briefly scrolling through these aerial photographs, I think we did '84 --

MR. WOTRING: And we can move along, please.

Q. That's 1985. Does this also show portions of what we call -- confirm with me -- Pit 2 and 3

underwater?

A. Yes.

Q. And from your work in this case, do you see -- do you have an opinion about whether in this photograph we're looking at, do you see a breach in the berm?

A. Yes, I see it here (indicating).

Q. And where do you see that?

A. Right here (indicating).

Q. Okay. And what -- what -- why is that -- is that important?

A. Well, again, the vector that's moving the water out every day is water. You know, it's either the particles that are being moved by the water or it's the colloids or the dioxin that's dissolving in the water, itself. So the real key is that water was able -- these berms were not maintained, or at least weren't maintained at this time, to keep this breach from happening and, therefore, water was able to get into those every day and bring material out.

Q. You raise an interesting issue. You reviewed the historical documents about the site, these impoundments, right?

A. Yes.

Q. And do you have an opinion about whether there was any ongoing maintenance of the site during -- well,

let's just say after August of 1968?

A. I didn't see any maintenance records. And certainly what I see here aerially is inconsistent with any sort of building up of the levees or strengthening them or compacting them to prevent this from happening.

MR. WOTRING: Can we go to the next photo, Brian?

Q. In 1992, does that again show the portions of the impoundments underwater?

A. It does.

MR. WOTRING: Can we look at 1994?

A. What is significant about this picture is you kind of see -- you can see that during this period you start to see the erosion of material from the first impoundment, what we're calling Pit 1, from the northern side of the pit.

MR. WOTRING: Finally, if we move on to 1997 and 1998, and if we could look at 2002, the aerial photograph from No. 1005.

Q. Again, does that show the portions of Pits 2 -- no. What does it show?

A. Well, this screen outline again is the '89 footprint. It's not what is above water during this period. So you see, you know, again, from '89 and this time period you've got all of this material disappeared,

1 all of this material has disappeared. So you start to
2 see, essentially, by this time the first -- the Pits 2
3 and 3 are completely gone. And you are starting to see
4 the erosion of this third -- this most western pit that
5 we're calling Pit 1.
6 Q. Okay. And just taking this picture as an
7 example, how would dioxin get out of the impoundments
8 into the river?
9 A. Well, as water is passing over the surface
10 of -- of this area, if there was any of the waste left
11 by this period of time, it would -- of course, as the
12 current goes over it, it would stir up some of the
13 particles. Wind would also do the same thing. And it
14 would slowly erode it from the surface and this dioxin
15 is really down to particles. So that's an important
16 feature. Also the dioxin that is down in the waste in
17 the water, either as a colloid or as a dissolved form,
18 would exchange with the water as the water passed above
19 it.
20 Q. Okay. This is going to sound like a silly
21 question, but it's not. If the impoundments are under
22 the water, would you also say that they are adjacent to
23 the waters of the San Jacinto River?
24 A. They're in the water of the San Jacinto River,
25 but -- yeah, in or adjacent.

MR. SCHRADER: That calls for a legal opinion.

THE COURT: That will not be taken as a legal opinion. Maybe you can rephrase it.

Q. (By Mr. Wotring) Let's do it this way: Is Pit No. 1 on that area -- is that -- is that located adjacent to the San Jacinto River?

A. Yes.

Q. Okay. And the other two pits are under the water?

A. Yeah, they're in the San Jacinto River.

Q. They're in the San Jacinto River. So the floor, the bottom that we can't see under the water is under the water of the San Jacinto River, right?

A. Right.

MR. WOTRING: Let me ask if we can pull up, Brian, from Exhibit 386.

Q. And, Doctor, I think you can sit down. I think I can take down the survey.

MR. WOTRING: Can we pull up Figure 8-A from Exhibit No. 386, the first --

Q. And you're familiar with this picture?

A. Yes.

Q. And you're familiar with the date that it was taken on?

1 A. Yes. I think it was February or early 1973.
2 Q. And does this figure play a role in your
3 opinions in this matter?
4 A. It does.
5 Q. This is the one that you were looking at in
6 your appendix?
7 A. Yes.
8 MR. WOTRING: And could we also take --
9 Q. Look at Figure 8-D. And what do you see in --
10 do you see anything significant in Figure 8-D?
11 A. Yes. So this is the first image where you
12 really start to see that breach, sort of at about 2:00
13 o'clock here (indicating). And if you pay attention to
14 that location as we scroll through photos of a later
15 date, you would see -- you would see that that breach
16 kind of opens a little bit, but it certainly stays
17 consistent as I've placed the same color as the water.
18 Q. By the way, you looked at the opinions of
19 another expert in this case, did you not?
20 A. Yes.
21 Q. And who is that?
22 A. Dr. Bedient.
23 Q. Well, tell us who Dr. Bedient is.
24 A. He is a professor at Rice University.
25 Q. And what is he a professor of?

1 A. He's a surface water hydrologist, but he's also
2 a civil and environmental engineer, like myself.
3 Q. Okay. Well, why don't you explain to us
4 what -- what kind of issues you're addressing in this
5 case for Harris County and what kind of issues he's
6 addressing.
7 A. I'm addressing really the chemical issues of
8 how dioxin got out. And Dr. Bedient will be talking
9 about water movement. He's an expert on water movement.
10 Q. If I may, Dr. Bedient is in the courtroom,
11 isn't he?
12 A. He is.
13 Q. He put his hand up. That's Dr. Bedient
14 (indicating). We'll hear from him later.
15 I interrupted you, and I think I distracted
16 everybody. What is the difference between what you're
17 doing and what Dr. Bedient is going to do?
18 A. I'm going to talk about the chemicals. He's
19 going to talk about the water.
20 Q. Now, during this period of time -- and, again,
21 I need to ask this question: The pits that you see in
22 1973, when this photo was taken, are those pits adjacent
23 to the waters in the San Jacinto River?
24 A. Yes.
25 Q. Okay. Is there some water from the San Jacinto

1 River in the pits, do you think?
2 A. It looks like there is, yes.
3 Q. And why do you say that?
4 A. I see the same color here as I do inside
5 (indicating). And obviously I see a way for that water
6 to get inside.
7 Q. Okay. And is -- again, do you see the outline
8 of the three different pits we talked about? And one
9 more time, tell us which one is 1, 2, and 3.
10 A. This is 1, 2, and 3 (indicating).
11 Q. And from this period of time, whenever this
12 picture was taken, on through March 30th of 2008, do you
13 have an opinion about whether dioxin was being released
14 from Pits 2 and 3 every day?
15 A. Yes, I do believe it was -- I believe that it
16 was being released every day.
17 Q. Okay. And for Pit No. 1, do you have an
18 opinion about whether it was adjacent to the San Jacinto
19 River every day from the date of this picture in '73 on
20 through March 30th of 2008?
21 MR. SCHRADER: I renew my earlier
22 objection, that's calling for a legal conclusion.
23 THE COURT: It's not to be taken as a legal
24 conclusion.
25 MR. WOTRING: No.

1 THE COURT: You may answer, sir.
2 A. It is adjacent to the river, yes.
3 Q. (By Mr. Wotring) Now, there has been some --
4 not yet, but there might be some.
5 Discussion about the quality of the berms
6 around the levees. Do you understand -- and you have
7 information about the quality of the berms and the
8 levees?
9 A. Yes.
10 Q. And, again, the levees are the earthen
11 impoundments surrounding -- just highlight them for us.
12 A. (Witness complies). The middle and then the
13 outside.
14 Q. Where is No. 2?
15 A. This right here (indicating).
16 Q. Okay. So we don't have to do this again,
17 that's 1, 2 and 3 (indicating). And what information do
18 you have about what those were made out of?
19 A. Well, we don't know a lot of construction
20 details; but given some of the later borings that
21 happened through the levees during the investigations in
22 recent times, we believe -- I believe that the berms
23 were just made out of the soils that were present on the
24 site. And those were -- consisted of sand, silt and
25 clay that was there. So the berms were put together

1 with materials that were on the site.
2 Q. Okay. Are there historical documents that talk
3 about what the berms were made of?
4 A. No.
5 Q. There is no construction drawings?
6 A. No construction drawings, right.
7 Q. Okay. Does the information in the historical
8 documents give you some idea about what the berms -- how
9 the berms would weather over time?
10 A. Yes.
11 Q. And let's look at -- let's look at the private
12 Champion memorandum. While we're getting organized, let
13 me go on to another matter.
14 MR. WOTRING: If we could pull up Exhibit
15 No. 1436.
16 Q. Are you familiar with this document?
17 A. I am.
18 Q. And tell us what it is.
19 A. This is the contract between Champion and Ole
20 Peterson Construction Company, which was the first
21 contractor who took on handling this sludge and moving
22 it from Champion to another location.
23 Q. And does this agreement have any information
24 that you used in formulating your opinions in this case?
25 A. It does because it establishes the amount of

1 material that was there.
2 Q. And what paragraph do we go to to look for the
3 amount of the material that was there?
4 A. It would be done on the front page, I believe.
5 MR. WOTRING: So if we could blow up that
6 third paragraph --
7 A. Yes.
8 Q. And what in this -- in this paragraph gives you
9 information for your opinions in this case?
10 A. Well, we knew this 135,000 cubic yard figure
11 was important because we knew that's what the total
12 capacity of the basins that were on the Champion
13 property, that's all they could hold. Again, that's --
14 that's 38 or so Olympic-sized swimming pools, for
15 reference. So this contract was let -- allowing Ole
16 Peterson to remove that 135,000 cubic yards of material;
17 but then it also set up a regular process by which they
18 would come back and continue this process in the future.
19 And the 75,000 cubic yards is important because that's
20 about what they produced a year. So this was every
21 5 years they were going to come back and do the same
22 process. So this -- this confirmed a lot of the volume
23 that was helpful in my work.
24 Q. Okay. And --
25 MR. WOTRING: And if we could pull up the

first page of Exhibit No. 851.

Q. And you're familiar with this document? I've got a copy if you need it.

A. Yes.

MR. WOTRING: May I approach, Your Honor?

THE COURT: Yes.

(Document tendered)

Q. (By Mr. Wotring) All right. Well, tell us what this document is.

A. This is a monthly activity report from the pollution department of Champion, the Air and Stream Control department of Champion, talking about their activities for the month; and this says March of 1965.

Q. Okay. And if we could go to -- which paragraph in this document do you think is important for your opinions?

A. I think the second and the material under "Off-site Disposal of Sewer Sludge."

Q. All right. Well, what is important about this, in your opinion?

A. This, again, sets up the history of what happened. Ole Peterson partnered with an engineering company called Burma Engineering to develop this scheme to be able to take the sludge out of the secondary basins and move it to a location. The first thing they

1 had to figure out was how to -- how much water do we
2 need to add to get it out and to get it into a pumpable
3 form. So a trial was conducted, apparently, in March of
4 '65 to establish that.
5 And the other thing that was important, I
6 think, for me was this last sentence. It says, "We
7 intend to continue to work closely with all developments
8 in on-site disposal of sewer sludge as an aid to
9 contractors and to be certain that our interests are
10 protected."
11 As I'm establishing the timeline, that
12 really establishes kind of a partnership between
13 Champion and the contractor.
14 MR. SCHRADER: Objection, Your Honor. This
15 is beyond the scope of his expertise. We move to strike
16 that last part.
17 THE COURT: Sustained as to the last part
18 in that answer.
19 Q. (By Mr. Wotring) Let's look at the second
20 sentence. It says that "Sludge was loaded at an average
21 consistency of 11.4 percent and unloaded at
22 10.6 percent."
23 A. Uh-huh.
24 Q. Do you know what it's talking about?
25 A. That is the solids percentage. So you remember

when it gets into the basin initially from the primary basin, it's at 7 percent water. And then when it stays there it goes to -- it's 7 percent solids. And when it stays there it goes to a little more than 40 percent solids.

What they found was they had to add enough water to get it to about 10 percent to make it go through the pipe.

Q. I see. Okay. There's been some discussion -- or might be some discussion in this case that because the sludge material at the plant had to be jetted out with water, that that means it was -- the physical characteristics, that it wouldn't -- it wouldn't get out of the impoundments unless there was a similar jetting of water later on?

A. No. That's just what it took to get it into a form that would pump. It's a totally different concept.

Q. Well, why don't you explain why that's a totally different concept?

A. So they have to use a pump to move the sludge and water mixture. And the more solids that are there, it has to actually physically go through the pump, so the more solids that was there, the pump would break. So it had to be a really -- a slurry, a mixture of water and soil that was very water heavy. It looked like a

lot of water and not very much of the solid material. That is a totally different situation than, you know, wet cardboard underwater and what might happen with respect to the way that breaks down and the way particles may move off of that. Those are two totally different concepts.

Remember, the material that's there, you had to jet it out with water. It was still more than 50 percent water, even when it was in the secondary basins. It was a material that was just saturated with water.

Q. And if it was saturated with water when it was put into the -- well, let me do it this way: You'll remember from the 1955 memo there was a figure about what happened to the solid content of the sludge when it was left on the ground for a couple of years?

A. Yes.

Q. And remind us what that solid content was.

A. It reached a moisture content of 47 percent, which means the solids would be 100 minus that or 53 percent.

Q. Okay. Now, do you have an opinion about what the levees were constructed out of for the impoundments?

A. I believe they were constructed with an alluvial material that was on-site.

1 Q. And what does an "alluvial material" mean?
2 A. The river mud, the river sediment that had
3 been -- that was at the bank.
4 Q. And why do you have that opinion?
5 A. Well, that was what was present at the site.
6 The site -- the pits were constructed very quickly. The
7 land closed in August of 1965, and by September they
8 were already bringing sludge to the material -- to the
9 pits to be placed there. So a very quick construction
10 period.
11 The second thing is that in multiple
12 documents that you'll see, the levees are a problem.
13 People who come and visit the site, they immediately say
14 the levees are not strong enough, they're falling apart
15 and they're consequently having to be repaired during
16 this period of time when the sludge is there.
17 And that really is only consistent with
18 weak soil material that the levees had been made out of,
19 not a clay that would stick together very well, but a
20 material that also included sands and silts, that
21 whenever the river water would hit it or, you know, they
22 come in contact with rainwater, for example, you would
23 get this erosion process.
24 Q. Okay. And do you have any more contemporary
25 data about what the berms were made of?

A. We do. There was one boring that was done during the investigation by some of the consultants that went through one of the -- that central berm in the diagram.

MR. WOTRING: Can we pull up Exhibit No. 31?

Q. And what are you talking about, the central berm?

A. So this -- this one right here (indicating). In fact, the boring was made at about right at that location. But it's kind of the levee or the berm that separated the first pit and the second and third pit. So this right in this length here (indicating).

Q. We may have skipped a step here. In Texas we may all know what borings are, but maybe we don't. What is a soil boring?

A. It is when you take a core, like a circular piece of metal, and you push that through. We have machines called Geoprobes that you push through, and you can take a very deep sample all the way down, very deep in the ground. And we use those to understand, you know, what kind of materials are present, whether it's chemicals there, but also just, you know, what does the material look like, is it sand? Is it silt? Is it clay? Is it some mixture of that?

Q. What did that boring log show?
A. That boring log showed that, at least what this central berm was made out of, was a mixture of sand and silt and clay, so different layers of different kinds of materials, most like you would find adjacent to a river.
Q. And if -- well, you're familiar with the two letters that Dr. Quebedeaux wrote. We're looking at the May 25th and the June 11th letters.
A. Yes.
Q. You've seen these before?
A. I have.
Q. You'll save us some questioning if you can tell me what is in a Reese's Peanut Butter Cup?
A. Peanut butter and chocolate.
Q. Now, Dr. Quebedeaux does have some information in these letters about what the sides of the impoundments are made of.
A. Yes.
Q. And what does he say they're made of?
A. He says clay.
Q. And is -- is that consistent with the soil boring and other historical documents?
A. No, it is not.
Q. Is it -- is it usual or unusual when you're doing an investigation of historic impoundments to have

1 some data that's consistent or inconsistent?
2 MR. SCHRADER: Calls for speculation.
3 THE COURT: Sustained as phrased.
4 Q. (By Mr. Wotring) Have you ever -- you've
5 looked at other historic sites involving impoundments in
6 wetland environments?
7 A. Yes.
8 Q. And in those other sites, have you had an
9 opportunity to review the historic data?
10 A. Yeah. Sometimes, yeah.
11 Q. And are there occasions when the historic data
12 is not always consistent?
13 MR. SCHRADER: Objection, irrelevant and
14 incomplete after that.
15 THE COURT: Sustained.
16 MR. WOTRING: I'll move on.
17 Q. (By Mr. Wotring) Given the information you
18 have about the impoundments and what they were
19 constructed of, do you have an opinion about whether
20 they would have withstood being submerged under the
21 San Jacinto River, as we see from 1989 on?
22 A. No. I think they would have performed exactly
23 like we saw from the aerial photographs, that unless
24 they were maintained, unless they were repaired on a
25 regular basis, material would have eroded away and,

1 therefore, we saw what we saw. The water was able to
2 get into the impoundments when they weren't taken care
3 of.
4 Q. If the impoundments had been made out of clay
5 exclusively, do you think that you would see the kind of
6 outline of the berms that we see in the aerial
7 photographs that we've looked at?
8 A. They might last a little longer; but I think
9 just the fact that the river ended up overtaking the
10 site, I don't think that even clay berms that were never
11 maintained could have withstood that amount of water.
12 Q. Well, maybe we can do a little preview. You're
13 not going to be talking about how tides or water affects
14 the berms. That's primarily what Dr. Bedient is going
15 to talk about?
16 A. Correct.
17 Q. And whether the berms were constructed out of
18 clay or out of the material that you've talked about,
19 the alluvial material -- why do you call it alluvial
20 material?
21 A. That's the term they used in their borings.
22 The consultants for the parties used that term in their
23 borings when they were describing the material.
24 Q. What does "alluvial material" mean?
25 A. That means the typical material that's found in

1 river sediment, which is a mixture of sand, silt and
2 clay.
3 Q. And would that be what you would expect to be
4 in the San Jacinto River?
5 A. Yes.
6 Q. That kind of material?
7 A. Yes.
8 Q. Okay.
9 MR. WOTRING: If we could pull up what we
10 have talked about as Exhibit No. 135.
11 Your Honor, may I look over Brian's
12 shoulder for a second?
13 THE COURT: Yes, uh-huh.
14 Q. (By Mr. Wotring) You're familiar with this
15 document?
16 A. Yes.
17 MR. WOTRING: And if we could go to the
18 final paragraph and the final sentence.
19 Q. Now, if I might -- Dr. Pardue, we're not going
20 to be talking about the stuff that we're not going to be
21 reading.
22 A. Okay.
23 Q. And it says, "At the time given above, the
24 superintendent, Mr. Ned Chesser, was notified, since I
25 could not contact anyone at your office. Mr. Chesser

1 was asked to communicate to you the information that
2 within the next 24 hours... the dikes which are being
3 used to contain the waste should be repaired."
4 Do you see what I have read?
5 A. Yes.
6 Q. Now, if the dikes at the site where the
7 impoundments are located were made out of clay, do you
8 have an opinion about whether they would need to be
9 repaired by December of 1965?
10 A. No. Clay levees wouldn't have began to
11 disintegrate three months after they were constructed.
12 Q. You may have to say that again slower, for the
13 record.
14 A. Clay levees would not have begun to
15 disintegrate and require repair three months after they
16 were constructed.
17 MR. WOTRING: Your Honor, I think it might
18 be efficient if we took a break and discussed some other
19 documentary matters.
20 THE COURT: All right. Ladies and
21 gentlemen, we'll take a break.
22 I'll have you step down, too.
23 (Whereupon, after a bench discussion
24 outside the hearing of the reporter and jury, the
25 following proceedings were had:)

1 THE COURT: You may take the stand again,
2 Doctor. Please be seated.
3 You may continue, Mr. Wotring.
4 MR. WOTRING: Thank you, Your Honor.
5 Can you pull up Exhibit No. 16?
6 Q. (By Mr. Wotring) Doctor, you have looked at
7 this. You've reviewed this exhibit in forming your
8 opinions in this case? This is the December 30, 1965
9 private Champion memorandum?
10 A. Yes, I have.
11 Q. I want to talk about the stuff we're going to
12 read. It says in the first paragraph, "Attached are a
13 copy of a letter from" -- "dated December 28th, 1965,
14 relating to the disposal of Champion's waste sludge
15 material." Do you see where I have read from?
16 A. Yes, I do.
17 Q. And the -- does this exhibit -- does it play
18 any role in you forming your opinions in this case?
19 A. This is more information on the levee problems
20 related to the pits. This is in December of '65,
21 after -- again, referring to the September '65
22 construction date.
23 Q. Okay. And what information does this exhibit
24 provide to you about the construction of the levees?
25 A. Additional information about the levees being

in need of reinforcing some three months after they were constructed, and also referring to rain eroding away the slope of the levee, so that about half its original width had disappeared at two points.

Q. All right. Where should we be looking in this document to talk about, number one, the erosion of the levee?

A. It would be the second paragraph of the section termed No. 1.

Q. All right.

MR. WOTRING: Brian, would you mind blowing that up?

Q. And is this the paragraph?

A. Yes.

Q. And what is important -- or is there anything significant in this paragraph about your opinions in this case?

A. It just refers to rain washing away a significant portion of the levees, so the outside slope of the levee, such that it was reduced to about half its original width at a couple of points.

Q. Now, you might be going a little bit quicker, later in the afternoon. And if the rains -- if the berms were made out of clay, do you have an opinion about whether the rains would have been able to wash

1 them away?
2 A. No. That wouldn't have been possible.
3 Q. And, again, refresh everybody's memory between
4 when the start of the -- the impoundments were
5 constructed and the date of this document.
6 A. The impoundments were constructed sometime in
7 August and September of 1965; and this additional report
8 of levee damage is in December of '65.
9 MR. WOTRING: And if we could look at the
10 final paragraph on Exhibit Number 16.
11 Q. And that says -- well, you read it for us,
12 Doctor.
13 A. "The contractor has finished emptying the 'B'
14 Basin and is in the process of getting set up in the 'A'
15 Basin. He will be ready to start operating again during
16 the week of January 3rd. Further discussions will be
17 held with the contractor before the operation is
18 resumed."
19 Q. Does that give you information about the
20 loading of the impoundments?
21 A. Yes. So the B and A basin, in this paragraph,
22 refers to the numbering system in place at the plant for
23 the secondary basins.
24 Q. And then finally, go ahead and read the
25 concluding paragraph before we move along.

A. "I'm sure we all realize the sensitive nature of this entire operation and the need for special precaution in connection with the disposal of this waste material."

MR. WOTRING: And if we could look at Exhibit No. 44.

Q. And have you looked at this document before in reaching your opinions in this matter?

A. Yes.

Q. Okay. And, again, only talking about the portion we're going to read from, let me read it. It says, "Because of the pollution problem, it is impractical to consider further dumping at the present location on the San Jacinto River." Do you see where I'm reading?

A. Yes.

Q. And if the berms were made out of clay, do you think there would have been -- well, do you have an opinion about whether you would have seen a pollution problem there?

MR. SCHRADER: Objection, Your Honor. That's speculation as to the meaning of the document.

THE COURT: Mr. Wotring?

MR. WOTRING: I'll try it again.

Q. (By Mr. Wotring) Based upon your review of the

1 information in this case, Dr. Pardue, have you
2 formulated an opinion about what the pollution problem
3 is in this document?
4 A. Well, the document continues --
5 MS. SCHRADER: Objection, Your Honor, calls
6 for speculation.
7 THE COURT: I think there is a difference
8 between referencing what they meant in this document
9 versus what you think is what he thinks from other
10 documents is the problem.
11 MR. WOTRING: Thank you, Your Honor.
12 Q. (By Mr. Wotring) Based upon your review of
13 other documents in this case, do you have an opinion
14 about what the pollution problem is referenced in the
15 portion of Exhibit No. 44 I just read?
16 A. I do.
17 Q. And would you tell us what that opinion is?
18 MR. SCHRADER: Same objection, Your Honor.
19 It calls for speculation. It's not expert opinion
20 testimony.
21 THE COURT: Counsel, approach for just a
22 second.
23 (After a bench discussion outside the
24 hearing of the reporter and jury, the following
25 proceedings were had:)

1 THE COURT: Sustained.
2 MR. WOTRING: Now, if we could pull up
3 Exhibit No. 143, which are the board minutes from
4 August 19th, 1968.
5 Q. (By Mr. Wotring) And have you looked at these
6 before, Doctor?
7 A. Yes, I have.
8 Q. And did these board minutes --
9 MR. WOTRING: Your Honor, may I approach?
10 THE COURT: Yes.
11 MR. WOTRING: I'm assuming everybody -- do
12 you need another copy?
13 Q. (By Mr. Wotring) And what information is
14 contained in Exhibit No. 143 that is material to your
15 opinions in this case?
16 A. There is some discussion by the members of the
17 corporation about what to do and what they did,
18 ultimately, with the waste pit land.
19 Q. And what paragraph are you looking at for that
20 information?
21 A. I'm looking at the next-to-the-last-page, the
22 bottom two paragraphs.
23 Q. 301?
24 A. Yes.
25 MR. WOTRING: Can you pull up -- let's

1 start at the paragraph before. Can you pull up the
2 paragraph before?
3 Q. Does this paragraph have any information that
4 helped you formulate your opinion in this case?
5 A. Yes.
6 Q. Why don't you describe what information is in
7 there and how it relates to your opinion.
8 A. Well, this is, again, acknowledgment that the
9 pits are full, completely filled with waste materials
10 and can no longer serve as a dump site.
11 Q. Where does it say that in the portion of
12 Exhibit No. 143 that we're looking at?
13 A. It's the third paragraph in that -- in that --
14 I mean the third sentence in that paragraph. Excuse me.
15 Q. And why don't you indicate that with the laser
16 pointer that you've got.
17 A. Starting here (indicating).
18 Q. And the sentence states, "It was pointed out
19 that the property was completely filled with waste
20 material and could no longer serve as a dump site."
21 A. Correct.
22 Q. Then is there any other information contained
23 in the August 1968 board of directors minutes that is
24 material to your opinion?
25 A. Yes. The two paragraphs at the bottom of the

1 page, in terms of the resolution that was adopted by the
2 corporation at that time.
3 Q. Why don't you read the resolution?
4 A. Okay. "Resolved, that the real estate owned by
5 this corporation on the San Jacinto River, previously
6 used as a dump site in connection with corporate hauling
7 activities, be abandoned as a dump site; and that said
8 land be eliminated as an asset from the corporation's
9 books and records by reducing its stated book value from
10 the cost of $50,000 to the nominal sum of $1."
11 Q. And why is that information material to your
12 opinions in this case?
13 A. It indicated to me that the property was
14 abandoned by the corporation and no further maintenance
15 activities would be conducted.
16 Q. And from your review of the documents in this
17 case and the aerial photographs, do you have an opinion
18 about whether the property was maintained after the date
19 of these board of directors minutes?
20 A. Yes, I do.
21 Q. And what is that opinion, Dr. Pardue?
22 A. That it was not, that the levees were left to
23 erode into the river, allowing a release of dioxin into
24 the river.
25 Q. I have a couple more documents I want to talk

with you about, and I think we're going to need to use the Elmo for them.

MR. WOTRING: Your Honor, may I approach?

THE COURT: Yes.

MR. WOTRING: For the record, what I'm looking at is Figure 5-41 from Exhibit No. 298.

Q. (By Mr. Wotring) Have you looked at these before?

A. Yes.

Q. All right. The jury is not looking at it yet. So let's talk about Exhibit No. 298. There.

MR. WOTRING: Thank you, Brian.

Q. What is this document, Dr. Pardue? Let's start there.

A. This is what is called a Remedial Investigation Feasibility Study, which is part of the Superfund process.

Q. And this is one particular page from that study, correct?

A. It is.

Q. And what are we looking at on this one page?

A. We're looking at a map of the San Jacinto River in the area of the waste pits, starting at the Lake Houston Dam.

Q. Okay.

A. And the key thing here is kind of hard to see, but if you can focus on these yellow lines that correspond to mile markers -- okay, good.

Q. First of all, let's get oriented to where we're looking, where the pits are.

A. You need to go up a little bit in the graph, please. Okay, there.

Q. Now, with the laser pointer, tell us where the pits are.

A. This is I-10 and this red outline is where the original property boundary was located.

Q. First tell everybody, why are we looking at this document?

A. This document has information about the chemical fate of dioxin and provides evidence of the ongoing releases of dioxin from the waste pits.

Q. And so we've got the sites. Now tell us what those yellow lines are. First, show us the yellow lines.

A. This is one here (indicating).

Q. What is that showing us?

A. That's a mile-marker, and that's the miles from a certain datum which is below, further down in the graph.

Q. We've got some more information on this I want

1 to ask you about. What is that black line around?
2 A. This black line, I think, is the site -- the
3 total site boundary that the EPA established for the
4 Superfund site, if I'm not mistaken.
5 Q. The yellow lines are what?
6 A. Mile-markers.
7 Q. What is important, if anything, about the
8 information contained on this -- this, again, is Figure
9 5-41 in Exhibit 298?
10 A. It connects with a graph that I'd like to show
11 or would like to have shown, and would point you to the
12 site being located between mile marker 2 and 3 on
13 this -- on this aerial.
14 Q. Okay.
15 MR. WOTRING: And let's scroll out a little
16 bit, just a little bit. Thank you.
17 Q. And does this show the area surrounding the
18 impoundments and the area surrounding the site?
19 A. It does.
20 Q. Now, what is the table that we need to look at
21 to understand why this is important for your opinions?
22 A. Well, the graph is 5-43(a).
23 Q. All right.
24 MR. WOTRING: We need to scroll back out.
25 Sorry, Brian.

Q. Okay. What are we looking at first, generally?
A. So this is a graph of two different things. One is the dioxin that's dissolved in the water, okay, and one is the dioxin that is on the particles that are present in the river.
Q. So it's showing us two things, dioxin that is dissolved in the water?
A. Right.
Q. But I think some people may say dioxin is hydrophobic?
A. Yes.
Q. What is hydrophobic?
A. Hydrophobic means water heating or a chemical that wants to get out of water.
Q. I think I have heard some people say it's very hydrophobic?
A. Yes.
Q. So if it's very hydrophobic, then why would we see any readings on that portion of Figure 5-43(a)?
A. Well, it's tendency is to get out of the water; but certainly you can measure dioxin in water.
Q. And what is this showing?
A. So this is showing on the X axis or the bottom scale is this river mile and so --
Q. Wait a minute. Wait a minute. Show us the X

axis on that top chart.
A. Right here (indicating).
Q. That's the one going horizontal?
A. Horizontal, correct.
Q. That's the X axis?
A. Right.
Q. What is it showing?
A. That's the river mile that references the previous map that we showed you.
Q. Let's go back to the previous map.
A. Go down to the bottom left corner, please. So the data starts here. This is mile-marker zero where the San Jacinto goes into the Houston Ship Channel (indicating).
Q. And then you have -- what is the next mile-marker?
A. Mile-marker 1.
Q. What is the next mile-marker after that?
A. Mile-marker 2, which is just south of the I-10 bridge.
Q. What is the next mile-marker after that?
A. Mile-marker 3 is just past the waste pits.
Q. If you turn the page and go back to that table, what are we looking at now?
A. Now, with that little reference point, you

can -- you can start to see --

Q. Hang on. Hang on.

A. Okay.

MR. WOTRING: And I apologize to Brian for not having this lined up for him.

Q. Okay. Where is the 0 mile-marker on that table at the top?

A. It's right here (indicating).

Q. Okay. And if we follow that line up -- we talked about the X axis. Can you show us the X axis again?

A. Here (indicating).

Q. That's telling us space, right?

A. Right.

Q. Where is the 5 mile-marker on the X axis?

A. Right there (indicating).

Q. Where is the 10 mile-marker?

A. Right there (indicating).

Q. I think they get the rest. Now, what is the -- what is the other axis called?

A. So this is the Y axis, and it's the -- again --

Q. Wait a minute. Where is the Y axis?

A. Right here, the vertical axis (indicating).

Q. And what is that showing?

A. That is showing us the dioxin concentration in

the water in this top graph. It's in the water column. What is important in this is this is a long scale. So if something is different between here and here, it's a factor of 10, like 1 to 10, 10 to a hundred. So differences are larger than they appear on the graph.

Q. So things are -- things are bigger than what is in your mirror?

A. Right, exactly.

Q. Okay. And let's talk about the -- what it's measuring on the Y axis. The TCDD dissolved and the other figure, PG, per liter, what is that?

A. So picogram per liter is a very small measure, but that's what we measure for dioxin.

Q. I have to unpack some things for folks.

A. Sure.

Q. We start with -- start with a gram, and then what is -- what is a nanogram?

A. That's one billionth of a gram.

Q. And is a picogram bigger or smaller than a nanogram?

A. It's smaller.

Q. So it's smaller than one billionth of a gram?

A. Right.

Q. So we're measuring very tiny amounts of dioxin?

A. Very tiny amounts.

1 Q. And that, I think -- we may go to it again, but
2 that's what this chart is showing us, is dissolved
3 dioxin in picograms per liter?
4 A. Yes.
5 MR. SCHRADER: I object. We need to
6 approach.
7 THE COURT: All right.
8 (After a bench discussion outside the
9 hearing of the reporter and jury, the following
10 proceedings were had:)
11 THE COURT: Ladies and gentlemen, we need
12 to ask you to step out for a minute. We'll bring you
13 right back in.
14 (Jury not present).
15 THE COURT: Please be seated.
16 I know you are pulling that information.
17 MR. WOTRING: It's what we had at the bench
18 that I read that said that the 45-43(a) is one of his
19 tables in the Adriens-Johns supplement which was
20 provided before his deposition was taken.
21 THE COURT: And the supplement to his
22 opinions?
23 MR. WOTRING: Yes.
24 MR. GIUGLIANO: Your Honor, this was
25 referenced in the supplemental opinion with respect to

1 the EPA findings do not support the concept of a stable
2 waste layer in the impoundment, itself. It's in the
3 last paragraph of that saying, "In fact, the water
4 recovered had measurable dioxins." They're talking
5 about the water in the waste layer. So this wasn't
6 discussed or presented in the context of water
7 measurements here, here and here along a river
8 (indicating). That wasn't the whole point of this.
9 MR. WOTRING: It is in No. 18, Footnote 18.
10 THE COURT: Okay.
11 "In addition, water column TCDD and TCDF
12 were in order of magnitude higher in surface water and
13 suspended sediments above the northern impoundments when
14 compared with water upstream or downstream."
15 And that's what references Footnote 18,
16 which is Figure 5-43(a) and 5-43(b).
17 MR. GIUGLIANO: This is in rebuttal to the
18 comments about the stability of the waste layer. This
19 wasn't presented to -- as a basis for walking through
20 all the readings and talking about the dioxin levels
21 throughout. He has multiple times under oath said he
22 hasn't measured, has no comments or opinions on the
23 concentrations at any point in the river.
24 THE COURT: So, in other words, their
25 argument is that he's relying on that figure to show

1 that there wasn't stability in the impoundment, not to
2 show what the measurements are along the river.
3 MR. MUIR: Yes. But in order to do that,
4 that's -- the difference, the order of magnitude
5 difference he has there, that's what shows that
6 instability.
7 THE COURT: Okay.
8 MR. SCHRADER: I think I can --
9 MR. WOTRING: It is a little bit
10 prejudicial. I did provide this before, and now I have
11 had to call the jury out twice.
12 MR. SCHRADER: No. I did that one. That
13 was me.
14 THE COURT: You did. Isn't the way to
15 resolve this to make it clear we're talking about this
16 opinion?
17 MR. SCHRADER: That's the problem. The way
18 it's being presented now, it's making it look like there
19 is dioxin escaping from the site and traveling 10 miles.
20 THE COURT: Can't you -- I'll give you some
21 leeway if you want to jump to it, okay. I think that
22 may take care of the problem.
23 MR. SCHRADER: Yeah.
24 THE COURT: If you want to jump to the
25 opinion and show that that supports it, I'll give you

1 leeway to do that in a leading way. Because their
2 concern is that by you walking through it the way you
3 are, it's -- it appears to be being used for a different
4 purpose; and that's not what I hear you saying. So just
5 jump to the opinion and say, "This is the basis of your
6 opinion, right?" I'll let you lead him on that.
7 MR. WOTRING: I appreciate the Court's
8 guidance. I would also like to be able to explain that
9 he had some basis for this opinion. Again, this is --
10 THE COURT: That's okay, as long as you're
11 tying it to that opinion. I think what they're saying
12 is we're going through it to get up to the opinion and
13 it could appear it's for other purposes. So maybe you
14 could jump to the opinion and then show how it supports
15 the opinion.
16 It allows you to do the same thing. You
17 are just tying it to that opinion. In other words, I'm
18 going to let you explain it, have him show the basis,
19 all that. It just shows it's particularly tied to that
20 opinion.
21 MR. SCHRADER: I just want it to be clear,
22 there is not going to be any suggestion that what that
23 -- that what that graph is showing or is purported to
24 show is dioxin that has left this site and moved to
25 those locations.

1 THE COURT: No. That is not the purpose
2 for which he is offering it. That's why I am asking him
3 to jump to the opinion and clarify that. And then you
4 can describe that graph, that figure as much as you'd
5 like to.
6 MR. WOTRING: Is it okay if I hand him what
7 I'm talking about to do that?
8 THE COURT: Yes.
9 MR. WOTRING: So that we don't wander off?
10 THE COURT: Yes. That way you'll get the
11 ability to talk about that figure the way you want to;
12 but it's clear it's tied to that opinion.
13 MR. WOTRING: Is there an objection to me
14 conferring with Dr. Pardue to --
15 THE COURT: No, not for that purpose. I
16 think it will keep it all smoother.
17 (Jury Present)
18 THE COURT: Please be seated.
19 You may continue, Mr. Wotring.
20 MR. WOTRING: Thank you, Your Honor.
21 Q. (By Mr. Wotring) Okay. Let's try and
22 summarize your opinion. Do you have an opinion that
23 dioxin escaped from the impoundments?
24 A. Yes.
25 Q. And describe for us the mechanisms by which

that happened.

A. Well, I believe that dioxin escaped in particles. So as the water moved it in, either from the tidal action or after it goes beneath the surface of the river, then the water can mobilize or move particles which dioxin is attached to.

The other form is dissolved. So dioxin, as we've seen, very low concentrations in water, but that dissolved dioxin, if you put it in contact with the river, will exchange with that water and then go down the river, as well, in a dissolved form.

The third form of these really tiny particles we talked about before, the colloidal particles that give water that brown or yellow color, and dioxin can also attach to those and move out of the waste material, as well.

Q. Do you believe those mechanisms were at large every day from the period of that photograph in 1973 through March 30th of 2008?

A. As long as there was water in contact with the surface of the waste, those mechanisms are happening.

Q. Thank you. Now, we just spent some time going going through Exhibit No. 5-41, that map and then this table at 5-43(a). Here is the question I want to ask: Does that map and this table support your opinions about

1 how dioxin was released from the impoundments?
2 A. Yes, it does.
3 Q. How does -- how does it support your opinion on
4 that?
5 A. Well, what it shows is if you go up river --
6 so, again, this is downstream. I'm moving from Lake
7 Houston Dam down to the Ship Channel, confluence with
8 the Ship Channel. Note the concentrations here: Low,
9 .001. Here, it starts going up a little here. And
10 right when it gets over the impoundments -- this line
11 represents the impoundments -- at this point these
12 samples were taken in 2002, 2004, when the waste pits
13 had already gone beneath the water. So you take a boat,
14 you get on top of one of those and take a sample, what
15 you immediately see is the dissolved dioxin, okay, in
16 this top chart is two orders of magnitude higher at this
17 spot than it is further upstream.
18 Q. Okay. Let's stop right there. When you say
19 "two orders of magnitude higher," what does that mean?
20 A. Well, that means like 1 to 10 is one order of
21 magnitude and then 1 to 100 is two orders of magnitude.
22 So the concentrations immediately above the impoundments
23 is a hundred times higher than they were elsewhere in
24 the river.
25 Q. And, again, in that top portion of this graph,

1 what -- what type of dioxin are we looking at?
2 A. This is dissolved and probably also measures
3 the colloidal. We don't have a really great way of
4 separating those really tiny particles. So usually when
5 we measure dissolved, we kind of lump those two things
6 together; but in this case it's dissolved and the
7 measurement would have measured both dissolved and the
8 colloidal fraction.
9 Q. Okay. In the dissolved state?
10 A. Yes.
11 Q. So even though dioxin is very hydrophobic, you
12 can still measure it dissolved in water?
13 A. Yes.
14 Q. And that's what this graph shows?
15 A. It does.
16 Q. Now let's talk about the bottom table. Let's
17 go to the -- the horizontal axis. What is that?
18 A. So in the same way it's river mile, the same
19 orientation. Here is the -- the impoundments is here
20 (indicating). Here is zero, where the river runs into
21 the Ship Channel.
22 Q. Let's back you up a little more. How do we
23 know that's where the impoundments are? Do we go back
24 to the map?
25 A. Well, it's marked; but you can go back to the

map and see the impoundments are between mile-marker 2 and 3.

MR. WOTRING: I'm sorry, Brian, the earlier page.

A. So, again, you'll see here, here is the I-10 bridge again, and here is the 2 mile-marker and the 3 mile-marker. So the impoundments are kind of right between the 2 and the 3 mile-markers on the way, as they set up this map.

MR. WOTRING: Okay. Scroll back out, please.

A. So, if you count across here, this is zero, 1, 2, 3, 4, 5. So between the 2 and the 3 is where the impoundments are.

Q. And what is it showing on the bottom -- let's scroll over to the vertical axis. What is that showing?

A. That's the dioxin that's associated with particles. So the way that you would measure this is you would take a water sample and filter it. You would take it and pass it through a filter paper and collect those particles on the surface of that filter paper. Then you would measure what the concentration of dioxin was on the particles that were actually in the water.

Q. And what did they -- did they do that?

A. They did.

1 Q. And what does it show?
2 A. So in the same way, if you're going upstream,
3 you'll see lower concentrations. And then when you get
4 right above the pits, themselves, it's two orders of
5 magnitude, again, approximately here to here to here
6 (indicating), so 1 to a hundred higher right above the
7 impoundments. Again, this is 2002, 2004. 45 years
8 after the waste was deposited here, you still see these
9 mechanisms operating.
10 Q. And I don't know that we did this. When was
11 the data collected for these two tables that we've been
12 talking about?
13 A. 2002 and 2004 is the solid -- the solid line,
14 and I think the open circles are more recently. That
15 may be in the legend. I'm not sure of the date on the
16 open circles.
17 Q. Okay. Let's look at Figure 212. Do you have a
18 copy of that?
19 MR. WOTRING: Your Honor, may I approach?
20 THE COURT: Yes.
21 Q. (By Mr. Wotring) Okay. Did you look at
22 Figure 212 in formulating your opinions in this case?
23 A. Yes, I did.
24 Q. All right. And, briefly, how does Figure 212
25 relate to your opinions in this matter?

A. It is a measurement of the dioxin that was present in the water associated with the waste and the waste pits, well after the period of time when the waste was disposed in this location.

Q. And what are we looking at?

A. Again, you're looking at the outline of the site and then you're looking at the -- what is left of the waste pit impoundments, which is marked here (indicating); and then they're colored kind of a mustard color.

Q. What kind of data is contained on Figure 212?

A. What it shows are -- what these color-coded things are, they represent places where they went to measure groundwater in the impoundments. So some of these were very deep samples where they measured the water and some of them were very shallow.

Q. Let's stop right there. We're introducing a new term, so we need to talk about it. What is groundwater?

A. So it's water held beneath the surface. Think about a bathtub full of sand and inside that sand, if we put water in it, that's what we call groundwater. That is what we drink a lot in a lot of states, and it may be well below, hundreds of feet below the ground, 40 feet below the ground. But it's really any water that's

1 beneath the surface and it's associated with a porous
2 material, like sand or silt or in this case the waste
3 material.
4 Q. And what -- what is surface water?
5 A. Surface water is water that, of course, is
6 above that, you know, in a river or a lake or a pond
7 that is not associated with the porous materials that
8 are beneath the land surface.
9 Q. Maybe I made this too complicated. What would
10 you call the San Jacinto River water?
11 A. Surface water.
12 Q. And the stuff when we drill for the drinking
13 water, what is that?
14 A. Groundwater.
15 Q. So a drinking water well is groundwater; river
16 is surface water?
17 A. Yes.
18 Q. What are they doing here in this graph?
19 A. What they're trying to show in this graph is
20 trying to establish whether the groundwater around the
21 site is contaminated. So whether people who, for
22 example, would drill a drinking water well around the
23 site would have a danger from being in contact with the
24 chemicals.
25 Q. And what do the results show from the

1 investigation here on Figure 212?
2 A. Well, for the purpose of what I was asked to
3 do, there is a key piece of information. Again, what I
4 was asked to do was really to determine whether there
5 was indication that dioxin was leaving the site. So I
6 really focused in on this -- this measurement right here
7 (indicating), which was a really shallow groundwater
8 sample. It was taken about 2 feet below the surface of
9 the waste.
10 Q. Well, this is my fault.
11 MR. WOTRING: Brian, can you zoom in?
12 Q. And can you tell me where to zoom in with your
13 laser pointer?
14 A. It is like right here (indicating).
15 MR. WOTRING: Zoom in on that, Brian.
16 Q. We've got a bunch of letters and numbers and
17 circles. Let's start with which is the groundwater well
18 that you thought was important?
19 A. This here (indicating). This is San Jacinto
20 Monitoring Well, SJMW. "S" stands for surface, so near
21 the surface, and then the No. 4, so this location right
22 here (indicating), which is in the middle of Pit No. 1
23 from our original -- original characterization.
24 Q. So when you drill different wells, you have to
25 give them different names to keep track of the results?

A. Exactly.
Q. So these are just the way they picked to drill and name the wells?
A. Yes.
Q. And we're looking at different types of wells going to different levels in the western impoundment?
A. That's correct.
Q. And where is the one -- can we just call it 4?
A. Let's call it 4.
Q. Let's call it 4. Where is Well No. 4? Where is the target depth?
A. So it was about two feet below the ground. So the waste layer is sitting on top of the surface and they just wanted to see whether there was water inside the layer of waste and what the concentrations of dioxin were at that location.
Q. And when they -- how did they do that?
A. Well, in this case they didn't drill. They just took a pipe that had -- that was perforated, that had a sharp tip on it, and they just shoved that into the ground. And then the water that would have been there would have rushed inside the pipe, and then they sampled that by sucking the water through a tube that was placed inside the pipe.
Q. What do they call that pipe?

A. In this case they call this piezometers.
Q. Let's spell that.
A. P-i-e-z-o-m-e-t-e-r-s.
Q. And when they did that on Well 4, what did they find?
A. Well, they found very elevated concentrations of dioxin still in contact with the water that was within the waste.
Q. And is that a fact that you used in formulating your opinions?
A. It is, because it explains why in the previous graphs that we saw, we see that elevated dioxin level. If there is very high dioxin in the water that's in between the waste layer and that's releasing to the water over the top, then you are going to measure a lot of dioxin, if you drove your boat on top of this thing and took a sample.
Q. And is there any other page of exhibit -- or Figure 212 that we need to look at to understand your opinions on this?
A. If you want to see the concentrations, they're on the third page.
Q. Before we put that up, what is the figure title on the third page?
A. It says Table 5-6. It's the results of

1 groundwater sampling north of I-10. It's actually the
2 last page. I'm sorry. I misspoke.
3 Q. Can I look at that for a second before we put
4 that up?
5 A. Yes.
6 MR. WOTRING: Put that up, Brian.
7 Q. In which column do we need to look at for the
8 readings from Well No. 4?
9 A. All the way to the right.
10 Q. That has the same figure as on the earlier
11 page, SJMWS04?
12 A. Yes.
13 Q. And let's just orient everybody. All those
14 readings are from that same well?
15 A. Yes.
16 Q. And then if we go back all the way to the left,
17 what kind of -- what are we looking at? The different
18 metals they were testing?
19 A. Right, the different metals they were testing
20 for. Go further up, please.
21 We want to get on the next page, the fourth
22 page. I'm sorry. There we go.
23 These are all different kinds of organic
24 chemicals that would be hazardous in the environment.
25 And the dioxins, of which there are many different kinds

1 of dioxin, they are listed here on this table.
2 Q. And which is the one that you used in
3 formulating your opinions?
4 A. This one here (indicating) is the dioxin
5 2,3,7,8-TCDD, is the dioxin that is associated with
6 paper mill waste.
7 Q. When we have been talking about dioxin previous
8 to today, have we been talking about a particular type
9 of dioxin named 2,3,7,8-TCDD?
10 A. Yes. We've been generalizing to that
11 particular form.
12 Q. Can you tell us one time and one time only what
13 TCDD stands for?
14 A. Tetrachloro -- so that means there's four
15 chlorines on the molecule -- Dibenzodioxin, which is a
16 long way to say "dioxin."
17 Q. If we go all the way back out to the right on
18 that figure, what do those numbers show us?
19 A. So what you see in that water sample taken from
20 within the waste, you just -- it's in the same units as
21 before on the previous graph, picograms per liter -- you
22 see it's all the way up there at 2700 in concentration.
23 If you remember back from the previous graphs, those
24 numbers were quite a bit lower than that; but this is a
25 very elevated concentration of dioxin in that water

1 sample.
2 Q. Okay. And is that reading consistent with your
3 opinions in this case?
4 A. It is important to establish my opinions as
5 well.
6 Q. Why is that?
7 A. Because if there was no water in that waste
8 material layer, or if the concentrations of dioxin were
9 low in the water in that waste material layer, then the
10 whole idea of dissolved dioxin being an important part
11 of the transport mechanism just wouldn't fly. That
12 wouldn't be one of the things that we could point to as
13 a mechanism of release. But, again, this sample was
14 taken 50 years after the event. The waste was put there
15 and still you can measure these very elevated
16 concentrations in the water.
17 Q. Now, does both the information contained in
18 Figure 212 that we're looking at, which is out of
19 Exhibit No. 298, and the information in Figure 5-4 as
20 attached to Table 5-43(a), do you have an opinion about
21 whether that information supports your opinions,
22 Dr. Pardue?
23 A. It does. Both are important with respect to
24 the dissolved and particulate mechanisms.
25 MR. WOTRING: Dr. Pardue, that is all the

1 questions I have.
2 THE WITNESS: Thank you.
3 THE COURT: All right. Counsel approach.
4 (Whereupon, after a bench discussion
5 outside the hearing of the reporter and jury, the
6 following proceedings were had:)
7 CROSS-EXAMINATION
8 QUESTIONS BY MR. SCHRADER:
9 Q. Dr. Pardue, good afternoon. I'm David
10 Schrader. I represent International Paper.
11 A. Nice to meet you.
12 Q. You understand International Paper's
13 involvement in this case is through Champion Paper,
14 right?
15 A. I understand.
16 Q. So I'll be asking you some questions about
17 Champion.
18 A. Yes.
19 Q. The good news is I think we're not going to
20 keep you and the jury much longer this afternoon, but
21 we're going to go a little bit. Okay?
22 A. Okay. No problem.
23 Q. Let me start with Exhibit 861, please. This is
24 the -- do you remember you talked about this exhibit?
25 It's the --

1 MR. SCHRADER: If we could just highlight
2 the upper portion of the first page to reorient the
3 jury.
4 Q. This is the State Department of Health document
5 from May of 1966, correct?
6 A. Yes.
7 Q. All right.
8 MR. SCHRADER: And if we could go to the
9 second page, please.
10 Q. Now, remember you read to the jury a part that
11 you thought was important to your opinions; and that was
12 the first paragraph of this page. Do you remember that?
13 A. Yes.
14 Q. All right. You did not read for the jury the
15 second paragraph of this page, did you?
16 A. I don't recall.
17 Q. Okay. Well, let's look at the second
18 paragraph. And this is talking about the material that
19 was removed from the Champion site, right?
20 A. Yes.
21 Q. All right. Let's highlight the second
22 paragraph and go through this part, this part that you
23 didn't -- you didn't read on direct exam and go through
24 this here.
25 A. Okay. Do you want me to read it?

1 Q. Would you mind? Can you read the first
2 sentence there? We'll take them one at a time.
3 A. Sure. "The material appears to solidify
4 rapidly and Mr. Henderson reported that a vertical wall
5 can be cut in the ponds for removing it and that the
6 wall will stand."
7 Q. Okay. So the material solidifies rapidly, such
8 that when you cut it, it still -- it stands like a
9 vertical wall, correct?
10 A. Yes.
11 Q. It's not like mud, right, Dr. Pardue?
12 A. No, no. It's still 60 percent water; but it's
13 not like mud, right.
14 Q. All right. Now let's look at the next sentence
15 here where this contemporaneous document is describing
16 the material. Could you read that for us, please?
17 A. "It was also reported that after the material
18 had set a short time, that water will not penetrate it."
19 Q. That water will not penetrate it, right?
20 A. Yes.
21 Q. That's what this document from 1966 says, the
22 part that you did not read earlier, right?
23 A. Yes.
24 Q. All right. Let me ask you about another area
25 of your testimony. Do you remember testifying on direct

1 examination that there were, quote, "No historical
2 documents about what the berms were made of"?
3 A. Yes.
4 MR. SCHRADER: Could we go to Exhibit 4,
5 please? I'm sorry, Exhibit 30, Tab 4.
6 Q. This is a letter -- the jury has seen this
7 before and probably will see it again a few times --
8 from 1965 by Dr. Quebedeaux, who we're going to talk
9 about. And could you read --
10 MR. SCHRADER: Actually, I'd like the
11 second sentence, please, of the first paragraph.
12 Q. Could you read that second sentence, please, of
13 the first paragraph?
14 A. "This is particularly so, since the bottom and
15 sides, or dikes, are composed of clay, which should
16 render it practically impossible for seepage to escape
17 and enter in the San Jacinto River."
18 Q. And he's talking about the impoundments that
19 we've been talking about in this case, right?
20 A. It is.
21 Q. All right. Now, you have some criticisms of
22 the impoundments that you've offered to this jury,
23 correct?
24 A. I do. I have, yes.
25 Q. And those impoundments are located on an area

1 of property that we've been talking about near the
2 San Jacinto River, right?
3 A. Yes, they are.
4 Q. Do you recall that one of your assignments in
5 this case was not only to serve as an expert witness,
6 but also as a corporate representative for Harris County
7 in this case?
8 A. I recall that, yes.
9 Q. And you understood that the answers you gave as
10 part of that corporate representative deposition were
11 binding on the County in this case, right?
12 MR. WOTRING: Your Honor, I object to the
13 extent it's calling for a legal conclusion.
14 THE COURT: It's not to be taken as a legal
15 conclusion.
16 A. I don't recall that, but I don't understand the
17 question, actually.
18 Q. All right. You understood that you were
19 appearing as the representative for Harris County to
20 give testimony about the positions and claims that
21 Harris County was making in this case, correct?
22 A. Yes.
23 Q. All right. Is it true, as a representative of
24 Harris County, you know that Champion did not own the
25 property on which those pits that we've been talking

about were located?

A. That's correct.

Q. You're aware that International Paper did not own that property, right?

A. I'm aware.

Q. And you're aware that Champion did not transport the waste from the Pasadena mill to the impoundments that we've been talking about, right?

A. That's correct.

MR. SCHRADER: Could we pull up Exhibit 1436, please?

Q. This 1436, you talked a little bit about this on your direct examination as the contract between Champion Paper and Ole Peterson Construction Company, right?

A. Yes.

Q. One of the documents that you relied on in forming your opinion in this case, right?

A. It was.

Q. All right. And I think -- I think we have a stipulation. You can't see this, but the date of this document is April 29, 1965.

A. Okay.

Q. Does that sound about right to you?

A. That sounds about right.

1 Q. Let me ask you to look, please, at Paragraph 6
2 of this agreement. You've read this before, right?
3 A. Yes, I have.
4 Q. Could you read Paragraph 6, please?
5 A. 6. "Independent contractor. In performing
6 work hereunder, contractor will act in all respects as
7 an independent contractor and will have full right and
8 authority to determine the means and methods of carrying
9 out the work."
10 Q. And when we're talking about the contractor
11 here in this agreement, that's Ole Peterson, right?
12 A. It is.
13 Q. And this agreement provides that that work by
14 Ole Peterson would be done with Ole Peterson as an
15 independent contractor, right?
16 A. Yes. It says that in the contract, it does.
17 MR. SCHRADER: Let's just move ahead to the
18 last page, Subparagraph (f).
19 Q. It provides here that "The contractor shall
20 secure and keep in effect all permits and licenses
21 required in connection with the performance of the work
22 covered hereby, and shall comply with all governmental
23 laws, rules and regulations, whether Federal, State or
24 local, pertaining thereto." Is that right?
25 A. Yes.

1 Q. And as a representative of Harris County,
2 Dr. Pardue, you agree that Champion was not responsible
3 for maintaining the impoundments that you're talking
4 about in this case?
5 MR. WOTRING: Your Honor, I'm going to
6 object. He's not been designated as Harris County's
7 corporate representative on that topic here today, nor
8 do I think he was designated as that -- to cover that
9 topic when he was designated as a corporate
10 representative earlier.
11 THE COURT: All right. Counsel approach.
12 (Whereupon, after a bench discussion
13 outside the hearing of the reporter and jury, the
14 following proceedings were had:)
15 THE COURT: You may proceed,
16 Mr. Schrader.
17 MR. SCHRADER: Thank you.
18 Q. Dr. Pardue, do you recall when you appeared as
19 the corporate representative for Harris County in this
20 case, and you were asked who was responsible for
21 maintaining the pits, you did not identify Champion and
22 you did not identify International Paper?
23 A. I recall that, yes.
24 Q. Now, there was another party that was involved
25 with the design of the impoundments; and that was Harris

1 County itself, right?
2 A. I wouldn't say they were involved in the
3 design. They were perhaps involved in the approval, but
4 not the design.
5 Q. We've heard about Dr. Quebedeaux, the jury has,
6 right?
7 A. Yes.
8 Q. And you know about his background and
9 experience?
10 A. I do.
11 Q. You consider him to be a pollution expert?
12 A. At the time, yes.
13 Q. He was at the time in 1965, and that's the time
14 frame we're talking about here when these impoundments
15 were constructed, right?
16 A. Yes.
17 Q. And you know that he was physically at the
18 property where the impoundments were constructed, right?
19 A. He was.
20 Q. And when he was there, he was the director of
21 Air and Water Pollution Control for Harris County,
22 correct?
23 A. He was.
24 Q. And you agree that his observations, given his
25 experience, about what was going on should be credited,

1 right?
2 A. Some of them, yes.
3 Q. Only some of them?
4 A. Yes.
5 Q. And he was involved with the site from the very
6 beginning, right?
7 A. Yes.
8 Q. And you're aware that Dr. Quebedeaux has
9 testified that he was directly involved in helping
10 design the impoundments?
11 A. I'm not aware of that.
12 Q. Let me ask you -- let's just talk briefly about
13 depositions, because I don't think we've done this with
14 the jury yet.
15 A. Okay.
16 Q. Before a case like this goes to trial, the
17 parties have an opportunity to conduct discovery and
18 learn about each other's positions, right?
19 A. Yes.
20 Q. And one of the ways they do that is through a
21 deposition, right?
22 A. Yes.
23 Q. And that's an opportunity, like in your case,
24 we could sit down across the table from you and ask you
25 questions, right?

1 A. Yes.
2 Q. And in that process, although it's not always
3 in a courtroom, sometimes it's in a conference room, you
4 swear to tell the truth, just like you do when you are
5 testifying in court, right?
6 A. I do, yes.
7 Q. And in this case you gave two depositions,
8 right? One is as the representative of Harris County?
9 A. Yes.
10 Q. And another as an expert witness, right?
11 A. Correct.
12 Q. Okay. So let me ask you -- and I have some
13 extra copies here of your deposition. I want to see if
14 I can refresh your recollection of the question I just
15 asked you.
16 A. Okay.
17 Q. So this will be from your expert witness
18 deposition at Page 383, Lines 10 through 15; and I'll
19 get a copy for you right now.
20 MR. SCHRADER: May I hand Dr. Pardue a copy
21 of his transcript?
22 THE COURT: Yes.
23 Q. Here you go (document tendered).
24 A. Thanks.
25 Q. So this is your expert witness deposition, as I

said. And do you recall being asked this question and giving this answer:

"QUESTION: So Dr. Quebedeaux of Harris County says that he was directly involved in helping to design the waste pits in question, correct, sir?

"ANSWER: He makes that statement. He uses that word."

Correct?

A. Yes.

Q. And you agree that in certainly March of 1965, Dr. Quebedeaux was aware of the process that was going to be used to dispose of waste in these impoundments, right?

A. He had a general idea, I think.

Q. And he approved the process, right?

A. He did.

Q. And he knew exactly where the impoundments would be located?

A. He did, yes.

Q. Now --

MR. SCHRADER: Can y'all see that, if I put that here?

THE JURY: Yes.

Q. (By Mr. Schrader) So we talked about the contract that Champion eventually entered into with Ole

1 Peterson; and that was April 29, 1965, right?
2 A. Yes.
3 Q. I'm going to put that date down here.
4 Before -- before Champion ever entered into
5 that contract with Ole Peterson, that independent
6 contractor, Champion spoke to Harris County to make sure
7 that the proposal, what the contractor was going to do,
8 was okay with Harris County, right?
9 A. I don't believe I have that on my timeline.
10 Q. Let me see if I can help you out.
11 A. Sure.
12 Q. This is Exhibit 12.
13 MR. SCHRADER: Pull that up, please.
14 Q. This is a preadmitted document. Now, this is
15 March 5th of 1965, so a little bit more than a month
16 before the contract was entered into, right?
17 A. Right.
18 Q. March 5th, '65. And you can see that these are
19 notes of a conversation that Champion had with
20 Dr. Quebedeaux, right?
21 A. Yes.
22 Q. Let's just walk through what they discussed.
23 No. 1, "Dr. Quebedeaux indicated an awareness of our
24 potential contracting to dispose of sludge from the
25 settling basins." Right?

A. Yes.

Q. 2, "Was asked and did view Burns' method of handling and disposing of sludge." Right?

A. Yes.

Q. Now, Burns is related to Ole Peterson? They're connected, as you understand it?

A. Yes.

Q. So that's who he is referring to there.

3, "He approved Burns' method of developing a pond and storing these waste materials at the mouth of the San Jacinto River. Dr. Quebedeaux went further to say that he had inspected the Burns' equipment and ventured an opinion that this equipment was the best he had seen." Right?

A. Yes.

Q. Finally 4, "He did not, by direct statement, indicate disapproval of any other method of disposal but he did say that the Burns' method was at this moment the most satisfactory of any that he knew of." Right?

A. I see that, yes.

Q. So before Champion ever even enters into this contract with Ole Peterson to handle this waste, there is a conversation with Dr. Quebedeaux of Harris County, who tells him that this is the best way to go, right?

A. Yes.

1 Q. Okay. So Champion gets that approval, proceeds
2 ahead, enters into a contract with Ole Peterson. And
3 that's not the end of Dr. Quebedeaux's involvement,
4 right?
5 A. Right.
6 Q. All right. In fact, let's look at -- let's
7 look at Exhibit 4, which is one we've looked at already.
8 I'm sorry. I keep doing that. It's Exhibit 30, Tab 4.
9 Exhibit 30. This is Defendants' Exhibit 30.
10 Now, this -- this is a letter of May of
11 1965 from Dr. Quebedeaux, correct?
12 A. Yes.
13 Q. And you have that in your timeline, right?
14 A. I do.
15 Q. So this is after -- after Champion gets
16 approval from Harris County in a telephone conversation
17 for proceeding as it proposed, after the contract is
18 entered into; and now Dr. Quebedeaux begins having
19 communications directly with the contractor, right?
20 A. Yes.
21 Q. And this letter here is addressed to Burma
22 Engineering, the contractor, right?
23 A. Yes.
24 Q. May 25th of 1965. All right. And here again
25 Dr. Quebedeaux tells the contractor the location seems

to be ideal. He says that "we viewed yesterday." So he went out to the site again, right?

A. Yes.

Q. And we talked about the next part where he says, "This is particularly so since the bottom of the dikes are composed of clay." Right?

A. Yes.

Q. And then he says, "I would like to remind you again that your -- that your waste handling operation should be done in a manner that would not allow liquid waste to leave the property." Right?

A. Yes.

Q. That's what he tells the contractor, right?

A. Yes.

Q. But he tells him again the location is ideal and the impoundments are, right?

A. Yes.

Q. All right. Let me move this back. I may come back to this. I'll fill in the date of that letter. That was May 25th. Okay. Thank you.

So we talked about your -- your work in this case and the fact that you were actually designated as a representative to testify on Harris County's behalf, right?

A. Yes.

1 Q. Have you ever been employed by Harris County?
2 A. I have not.
3 Q. Are you now?
4 A. No.
5 Q. No. And, in fact, you've not been hired by
6 Harris County in this case. You've been hired by the
7 outside lawyers, right?
8 A. I have.
9 Q. And they're paying you for your work in this
10 case, right?
11 A. They are, yes.
12 Q. And the positions that Harris County is taking
13 in this case you learned from the lawyers, the outside
14 lawyers, right, in conversations with them?
15 A. Yeah, those and with some involvement from the
16 Harris County attorneys as well, yes.
17 Q. Which Harris County attorneys?
18 A. Well, we had meetings with Mr. Owens and
19 Mr. Wotring, yes.
20 Q. Both of whom are here?
21 A. Both of whom are here, yes.
22 Q. You did not learn any of the positions that
23 Harris County is taking in this case from anyone else,
24 like somebody from the Pollution Control Unit or
25 anything like that, did you?

1 A. Not at all.
2 Q. You've never even spoken to those people at
3 all, have you?
4 A. Not until later on, correct.
5 MR. SCHRADER: Your Honor, I promised you
6 I would finish by 4:30. Now seems to be sort of a
7 natural breaking point.
8 THE COURT: Ladies and gentlemen, we're
9 going to let you go home on a Friday afternoon. We may
10 do some more work. And we'll see you ready to start up
11 on Tuesday morning at 9:30. We'll see you on the 21st
12 ready to start up at 9:30. Have a great weekend.
13 (Evening recess)
14
15
16
17
18
19
20
21
22
23
24
25

1 THE STATE OF TEXAS
COUNTY OF HARRIS
2
3 I, Kimberly Kidd, Official Court Reporter
4 in and for the 295th District Court of Harris County,
5 State of Texas, do hereby certify that the above and
6 foregoing contains a true and correct daily copy
7 transcription of all portions of evidence and other
8 proceedings requested in writing by counsel for the
9 parties to be included in this volume of the Reporter's
10 Record, in the above-styled and numbered cause, all of
11 which occurred in open court or in chambers and were
12 reported by me.
13 I further certify that this Reporter's
14 Record of the proceedings truly and correctly reflects
15 the exhibits, if any, admitted, tendered in an offer of
16 proof or offered into evidence.
17 WITNESS my hand this the 17th day of
18 October, 2014.
19
20
21 /s/ Kimberly Kidd
Kimberly Kidd, Texas CSR No. 2437
22 Expiration Date: 12/31/15
Official Court Reporter
23 295th District Court
Harris County, Texas
24 201 Caroline, 14th Floor
Houston, Texas 77002
25 (713) 368-6453

$

$1 [1] - 140:10
$250 [1] - 41:24
$50,000 [1] - 140:10
$54,000 [1] - 42:6

'

'40s [2] - 57:23, 59:3
'65 [8] - 22:4, 25:10, 58:24, 123:4, 133:20, 133:21, 135:8, 178:18
'66 [2] - 22:7, 98:2
'73 [4] - 10:9, 11:7, 11:11, 118:19
'80s [1] - 29:25
'84 [3] - 108:18, 108:20, 111:21
'89 [3] - 107:5, 113:22, 113:24
'A' [1] - 135:14
'B' [1] - 135:13
'why [1] - 14:10

/

/s [1] - 184:21

0

0 [1] - 146:6
001 [1] - 154:9
0311299 [1] - 5:17

1

1 [37] - 1:1, 43:18, 43:22, 43:23, 43:24, 45:6, 45:9, 45:14, 46:10, 70:13, 73:1, 74:18, 85:3, 86:2, 89:3, 102:10, 104:17, 111:6, 113:15, 114:5, 115:6, 118:9, 118:10, 118:17, 119:17, 134:9, 145:17, 147:4, 154:20, 154:21, 156:12, 157:6, 160:22, 178:23
1.24 [2] - 105:4, 105:6
10 [15] - 18:20, 23:5, 55:10, 62:6, 69:2, 85:7, 85:9, 124:7, 146:17, 147:4, 150:19, 154:20, 176:18
10-mile [1] - 75:24
10.6 [1] - 123:22
10/15 [1] - 18:25
100 [3] - 54:18, 125:20, 154:21
1000 [1] - 3:15
1005 [10] - 96:20, 102:11, 103:21, 103:25, 105:13, 105:23, 105:25, 107:2, 110:18, 113:19
1019 [1] - 2:12
1050 [1] - 3:21
11.4 [1] - 123:21
110 [3] - 13:14, 54:23, 55:25
1100 [1] - 3:6
1111 [1] - 4:6
116 [1] - 25:5
11th [1] - 128:8
12 [2] - 26:19, 178:12
12/31/15 [1] - 184:22
125,000 [2] - 46:7, 46:19
12548 [1] - 2:19
130,000 [1] - 46:8
135 [3] - 7:19, 8:14, 131:10
135,000 [5] - 49:25, 74:4, 74:8, 121:10, 121:16
13th [3] - 23:4, 25:10, 73:4
143 [3] - 138:3, 138:14, 139:12
1436 [3] - 120:15, 171:11, 171:12
14th [1] - 184:24
15 [2] - 41:9, 176:18
15TH [1] - 2:12
16 [2] - 133:5, 135:10
17 [4] - 1:15, 79:22, 80:5, 81:6
17th [3] - 1:18, 5:1, 184:17
18 [4] - 59:13, 149:9, 149:15
187 [1] - 19:2
1947 [4] - 58:17, 63:4, 64:12, 64:21
1955 [11] - 18:11, 51:8, 55:5, 56:2, 57:22, 62:16, 64:2, 65:6, 65:10, 67:20, 125:14
1957 [1] - 64:6
1960's [1] - 96:8
1964 [3] - 106:7, 106:8, 106:11
1964/1965 [1] - 62:2
1965 [26] - 17:18, 17:24, 18:16, 23:5, 26:18, 26:22, 58:17, 62:16, 63:3, 73:2, 73:4, 84:14, 122:13, 126:7, 132:9, 133:8, 133:13, 135:7, 169:8, 171:22, 174:13, 177:10, 178:1, 178:15, 180:11, 180:24
1966 [16] - 12:25, 23:5, 26:23, 43:6, 86:14, 86:20, 87:1, 87:25, 88:9, 88:11, 90:20, 90:22, 98:5, 108:24, 167:5, 168:21
1968 [3] - 113:1, 138:4, 139:23
1973 [12] - 10:14, 12:25, 99:14, 107:4, 107:21, 108:7, 108:10, 110:19, 116:1, 117:22, 153:18
1985 [1] - 111:24
1989 [8] - 104:10, 105:10, 105:11, 106:14, 106:18, 106:20, 108:17, 129:21
1992 [4] - 9:4, 30:5, 30:6, 113:8
1994 [1] - 113:11
1997 [1] - 113:18
1998 [1] - 113:18
19th [1] - 138:4
1st [1] - 105:11

2

2 [39] - 24:12, 43:22, 44:17, 44:19, 45:4, 45:9, 45:14, 61:23, 62:4, 69:1, 70:18, 70:21, 70:23, 74:18, 85:3, 86:1, 98:9, 104:13, 104:17, 105:16, 105:23, 111:6, 111:25, 113:20, 114:2, 118:9, 118:10, 118:14, 119:14, 119:17, 143:12, 145:19, 156:1, 156:6, 156:8, 156:13, 160:8, 179:2
2,3,7,8-TCDD [2] - 164:5, 164:9
20 [3] - 35:4, 46:17, 59:13
20-acre [1] - 106:24
200 [1] - 42:3
2002 [4] - 113:18, 154:12, 157:7, 157:13
20036-5306 [1] - 3:22
2004 [3] - 154:12, 157:7, 157:13
2005 [2] - 6:3, 6:18
2006 [1] - 6:7
2008 [4] - 105:19, 118:12, 118:20, 153:19
201 [1] - 184:24
2011-76724 [1] - 1:2
2014 [4] - 1:15, 1:18, 5:1, 184:18
202.955.8500 [1] - 3:22
211 [1] - 19:2
211A [1] - 19:3
212 [7] - 157:17, 157:22, 157:24, 158:11, 160:1, 162:19, 165:18
215 [1] - 17:13
216 [8] - 17:11, 17:12, 17:14, 17:15, 18:12, 18:14, 18:15, 19:3
217 [1] - 19:3
21st [4] - 51:8, 55:5, 65:6, 183:11
22 [1] - 98:5
221 [1] - 19:3
222 [1] - 19:3
22nd [3] - 88:9, 91:2, 91:4
2353 [1] - 68:6
2354 [1] - 70:18
24 [2] - 49:7, 132:2
2437 [1] - 184:21
25TH [1] - 4:6
25th [3] - 128:8, 180:24, 181:20
26 [1] - 49:1
2700 [1] - 164:22
289 [1] - 19:3
28th [1] - 133:13
29 [2] - 171:22, 178:1
291 [1] - 29:2
295th [2] - 184:4, 184:23
295TH [1] - 1:11
298 [4] - 141:6, 141:11, 143:9, 165:19
2:00 [1] - 116:12

3

3 [35] - 43:22, 44:20, 44:22, 45:1, 45:9, 45:15, 46:12, 70:21, 70:23, 74:18, 85:1, 85:4, 85:22, 85:23, 86:3, 104:13, 104:17, 105:16, 111:6, 111:25, 114:3, 118:9, 118:10, 118:14, 119:17, 143:12, 145:22, 156:2, 156:7, 156:8, 156:13, 179:9
3-foot [1] - 46:11
30 [5] - 133:8, 169:5, 180:8, 180:9
300 [1] - 69:1
301 [1] - 138:23
30th [4] - 105:19, 118:12, 118:20, 153:19
31 [5] - 43:4, 43:5, 70:14, 83:5, 127:6
34 [1] - 49:3
368-6453 [1] - 184:25
38 [5] - 46:19, 46:22, 47:4, 50:1, 121:14
383 [1] - 176:18
386 [2] - 115:17, 115:21
3rd [1] - 135:16

4

4 [17] - 24:9, 24:12, 25:6, 88:23, 156:13, 160:21, 161:8, 161:9, 161:10, 162:4, 163:8, 169:4, 169:5, 179:16, 180:7, 180:8
40 [2] - 124:4, 158:24
400 [2] - 54:24, 55:25
4000 [1] - 3:15
4024 [1] - 77:3
403 [1] - 11:16
4213 [2] - 90:3, 90:9
4214 [1] - 89:9
43 [14] - 18:11, 24:7, 50:23, 51:5, 51:7, 53:1, 55:14, 56:25, 57:7, 61:18, 61:23, 62:5, 63:25, 65:5
44 [2] - 136:6, 137:15
45 [1] - 157:7
45-43(a [1] - 148:18
47 [3] - 66:21, 66:25,

125:19
4:30 [1] - 183:6

5

5 [4] - 96:3, 121:21, 146:15, 156:13
5-4 [1] - 165:19
5-41 [3] - 141:6, 143:9, 153:23
5-43(a [3] - 144:19, 149:16, 165:20
5-43(a) [2] - 143:22, 153:24
5-43(b) [1] - 149:16
5-6 [1] - 162:25
50 [4] - 46:17, 54:18, 125:9, 165:14
512-463.2012 [1] - 2:20
53 [1] - 125:21
5300 [1] - 3:6
56 [2] - 52:18, 66:12
5th [5] - 17:18, 17:24, 18:16, 178:15, 178:18

6

6 [4] - 46:18, 172:1, 172:4, 172:5
60 [3] - 38:18, 67:3, 168:12
60-plus [1] - 38:18
600 [1] - 2:5
63 [2] - 65:13, 67:7
65 [1] - 67:3

7

7 [8] - 26:17, 49:7, 52:7, 65:7, 65:12, 65:25, 124:2, 124:3
700 [1] - 2:5
713 [1] - 184:25
713.650.8805 [1] - 3:7
713.651.2663 [1] - 4:7
713.755.7880 [1] - 2:13
713.890.5000 [1] - 3:16
713.980.1713 [1] - 2:6
73 [1] - 80:21
75,000 [1] - 121:19
77002 [5] - 2:6, 2:12, 3:6, 3:16, 184:24
77002-5242 [1] - 4:6
78711-2548 [1] - 2:19

8

8 [1] - 5:7
8-A [1] - 115:20
8-D [2] - 116:9, 116:10
851 [1] - 122:1
858 [9] - 68:6, 69:19, 70:18, 79:13, 81:7, 81:11, 85:4, 85:8, 91:8
861 [22] - 71:16, 71:19, 71:22, 71:25, 72:6, 72:10, 73:15, 73:22, 74:1, 76:2, 76:3, 76:6, 76:12, 81:5, 81:11, 83:24, 85:21, 89:9, 97:6, 109:8, 109:15, 166:23
88 [1] - 18:25

9

93 [5] - 52:6, 65:7, 66:1, 66:11, 67:7
9:30 [2] - 183:11, 183:12

A

A&M [1] - 64:21
abandoned [2] - 140:7, 140:14
Aberdeen [1] - 35:11
ability [1] - 152:11
able [16] - 10:25, 12:16, 17:3, 27:10, 42:11, 45:17, 50:11, 78:11, 84:22, 93:9, 112:15, 112:18, 122:24, 130:1, 134:25, 151:8
above-entitled [1] - 1:18
above-styled [1] - 184:10
absolute [1] - 8:7
absolutely [6] - 8:8, 17:16, 21:14, 22:13, 84:5, 103:18
academic [2] - 32:14, 32:19
accept [1] - 39:5
accordance [1] - 81:9
according [2] - 66:19, 98:18
accurate [1] - 59:1
accused [1] - 85:5
acknowledgment [1] - 139:8
acres [4] - 26:19, 49:23, 106:23, 106:25
act [1] - 172:6
acting [1] - 1:5
action [1] - 153:4
activities [11] - 29:20, 31:5, 31:6, 33:15, 33:17, 35:14, 86:20, 87:13, 122:13, 140:7, 140:15
activity [2] - 33:5, 122:10
actual [4] - 57:25, 59:8, 59:14, 103:13
add [8] - 6:14, 47:2, 47:6, 47:22, 52:16, 96:5, 123:2, 124:6
adding [2] - 37:20
addition [5] - 34:24, 47:3, 80:20, 87:4, 149:11
additional [4] - 98:17, 98:19, 133:25, 135:7
address [15] - 12:4, 14:24, 16:21, 23:20, 50:22, 57:16, 59:3, 60:18, 82:22, 86:11, 90:25, 93:19, 94:7, 95:18, 96:13
addressed [3] - 87:7, 88:6, 180:21
addressing [4] - 94:2, 117:4, 117:6, 117:7
adjacent [10] - 21:3, 26:20, 75:18, 114:22, 114:25, 115:7, 117:22, 118:18, 119:2, 128:5
admissible [1] - 10:24
admit [2] - 58:8, 91:15
admitted [7] - 19:2, 26:5, 80:4, 81:11, 96:19, 96:21, 184:15
adopted [1] - 140:1
Adriens [1] - 148:19
Adriens-Johns [1] - 148:19
advanced [1] - 5:21
advisable [1] - 16:7
aerial [18] - 41:4, 43:6, 96:21, 105:20, 106:3, 107:1, 107:10, 107:15, 107:18, 107:25, 108:9, 108:15, 111:20, 113:18, 129:23, 130:6, 140:17, 143:13
aerially [1] - 113:3
affects [1] - 130:13
afternoon [4] - 134:23, 166:9, 166:20, 183:9
ago [2] - 15:7, 73:1
agree [9] - 12:2, 13:1, 18:17, 18:18, 86:7, 90:3, 173:2, 174:24, 177:10
agreed [2] - 24:1, 78:10
agreement [11] - 19:6, 19:13, 78:19, 79:7, 79:9, 81:9, 87:18, 120:23, 172:2, 172:11, 172:13
agreements [2] - 78:7, 78:8
agrees [1] - 86:6
ahead [5] - 47:10, 77:22, 135:24, 172:17, 180:2
aid [1] - 123:8
air [2] - 122:11, 174:21
allegations [1] - 24:4
allege [1] - 18:2
alleged [1] - 21:2
allow [1] - 181:10
allowed [3] - 66:23, 73:11, 99:23
allowing [2] - 121:15, 140:23
allows [2] - 100:19, 151:16
alluvial [5] - 125:25, 126:1, 130:19, 130:24
almost [1] - 91:6
alone [1] - 98:12
AMANDES [1] - 3:18
amount [19] - 5:12, 8:5, 12:15, 12:20, 13:10, 18:1, 19:18, 20:1, 20:2, 24:4, 37:25, 49:24, 99:1, 106:14, 106:17, 106:19, 120:25, 121:3, 130:11
amounts [8] - 45:21, 48:25, 56:8, 65:17, 73:7, 73:24, 147:24, 147:25
ample [1] - 87:21
analogy [1] - 49:3
analyses [1] - 56:22
analysis [6] - 36:19, 56:15, 56:19, 68:18, 74:11, 109:19
AND [4] - 1:10, 2:10, 3:4, 3:20
ANSWER [1] - 177:6
answer [5] - 21:24, 55:18, 119:1, 123:18, 177:2
answered [1] - 83:22
answers [1] - 170:9
ANTHONY [2] - 2:21, 3:9
anxious [1] - 89:12
apart [4] - 88:22, 107:8, 111:3, 126:14
apologies [1] - 76:20
apologize [2] - 85:14, 146:4
appear [3] - 98:15, 147:5, 151:13
appeared [1] - 173:18
appearing [1] - 170:19
appendix [1] - 116:6
application [4] - 77:12, 86:15, 86:17, 86:22
applied [1] - 65:16
applies [1] - 64:13
apply [2] - 59:12, 65:14
appreciate [2] - 61:3, 151:7
approach [13] - 50:24, 57:10, 68:7, 76:15, 77:17, 122:5, 137:21, 138:9, 141:3, 148:6, 157:19, 166:3, 173:11
approached [2] - 14:9, 14:19
approval [3] - 174:3, 180:1, 180:16
approved [4] - 54:24, 56:1, 177:15, 179:9
approximate [1] - 54:5
April [10] - 86:24, 88:9, 91:2, 91:4, 91:10, 98:5, 105:10, 108:24, 171:22, 178:1
aquatic [1] - 69:7
area [18] - 31:16, 43:7, 54:9, 75:16, 90:23, 102:15, 105:15, 106:10, 108:2, 108:3, 108:4, 114:10, 115:6, 141:23, 143:17, 143:18, 168:24, 169:25
areas [2] - 39:21, 103:13
argue [1] - 10:25
argued [1] - 8:13

arguing [3] - 8:14, 88:3, 93:6
argument [8] - 7:25, 9:12, 11:14, 13:10, 13:11, 78:14, 82:9, 149:25
arguments [3] - 5:24, 7:10, 11:18
Arkansas [1] - 34:1
Army [1] - 35:12
article [1] - 39:17
articles [3] - 38:16, 38:19, 39:13
aspect [1] - 53:13
asset [1] - 140:8
assigned [2] - 21:6, 21:11
assignments [1] - 170:4
ASSISTANT [2] - 2:14, 2:21
assisted [1] - 1:21
associated [6] - 73:8, 156:17, 158:2, 159:1, 159:7, 164:5
assuming [1] - 138:11
attach [2] - 100:17, 153:15
attached [4] - 96:20, 133:12, 153:6, 165:20
attachments [1] - 71:24
attempted [1] - 84:25
attempting [5] - 17:25, 79:1, 79:25, 80:23, 96:6
attention [2] - 7:5, 116:13
ATTORNEY [4] - 2:11, 2:14, 2:18, 2:21
attorneys [2] - 182:16, 182:17
attract [1] - 33:25
August [9] - 17:18, 17:24, 18:16, 88:10, 113:1, 126:7, 135:7, 138:4, 139:23
AUSTIN [1] - 2:19
authenticated [1] - 6:11
authority [1] - 172:8
availability [1] - 55:1
available [2] - 45:24, 109:20
AVENUE [1] - 3:21
average [3] - 66:20, 66:24, 123:20
avoid [1] - 83:19
aware [8] - 26:1, 87:13, 171:3, 171:5, 171:6, 175:8, 175:11, 177:11
awareness [1] - 178:23
axis [13] - 144:23, 145:1, 145:5, 146:10, 146:15, 146:20, 146:21, 146:22, 146:23, 147:10, 155:17, 156:16

B

background [2] - 29:3, 174:8
bacteria [1] - 69:5
badly [1] - 100:17
Baker [1] - 1:19
BAKER [6] - 2:4, 2:8, 6:8, 7:12, 8:14, 9:16
BALLESTEROS [1] - 3:10
bank [1] - 126:3
barge [10] - 26:21, 54:10, 65:15, 67:9, 75:7, 75:11, 75:18, 75:20, 75:22, 75:25
barged [1] - 75:20
barges [1] - 90:14
barging [3] - 54:12, 54:20, 86:4
bark [2] - 47:21, 49:19
BARRETT [1] - 3:8
base [2] - 35:12, 47:24
based [17] - 6:11, 10:18, 11:5, 11:10, 16:24, 50:10, 50:15, 50:20, 53:10, 53:17, 55:14, 57:4, 63:8, 65:5, 83:5, 136:25, 137:12
basin [9] - 17:21, 49:16, 49:20, 73:9, 124:1, 124:2, 135:14, 135:15, 135:21
basing [1] - 60:18
basins [15] - 20:6, 49:23, 50:3, 52:3, 52:8, 53:18, 53:21, 54:2, 67:8, 75:15, 121:12, 122:25, 125:10, 135:23, 178:25
basis [8] - 56:9, 99:15, 100:7, 129:25, 149:19, 151:5, 151:9, 151:18
bathtub [1] - 158:21
Baton [2] - 29:8, 35:3
Bayou [5] - 86:17, 87:14, 88:4, 88:5, 88:9
become [1] - 110:23
becomes [1] - 111:2
Bedient [10] - 8:3, 8:6, 23:2, 116:22, 116:23, 117:8, 117:10, 117:13, 117:17, 130:14
began [3] - 25:10, 25:12, 132:10
beginning [2] - 73:4, 175:6
begins [1] - 180:18
begun [2] - 73:1, 132:14
behalf [4] - 32:23, 33:1, 80:2, 181:24
behaves [2] - 36:24, 37:10
believes [1] - 23:16
belong [1] - 25:11
below [10] - 54:4, 55:22, 64:24, 105:6, 142:23, 158:24, 158:25, 160:8, 161:12
bench [10] - 57:12, 76:17, 77:19, 89:24, 132:23, 137:23, 148:8, 148:17, 166:4, 173:12
beneath [7] - 104:6, 104:18, 153:4, 154:13, 158:20, 159:1, 159:8
Benedict [2] - 15:5, 91:12
BENEDICT [12] - 2:21, 5:15, 6:1, 15:6, 15:11, 15:22, 16:10, 16:17, 17:1, 17:5, 91:11, 91:13
benefits [1] - 94:25
BENNETT [2] - 6:14, 6:22
berm [9] - 43:25, 44:2, 44:3, 44:7, 112:5, 127:3, 127:8, 127:11, 128:3
berms [17] - 44:11, 112:16, 119:5, 119:7, 119:22, 119:25, 120:3, 120:8, 120:9, 126:25, 130:6, 130:10, 130:14, 130:17, 134:24, 136:17, 169:2
best [2] - 179:13, 179:24
better [5] - 5:16, 31:15, 31:18, 40:2, 78:8
between [23] - 10:14, 12:25, 26:22, 29:20, 36:18, 43:25, 44:7, 46:7, 51:12, 106:22, 107:18, 117:16, 120:19, 123:12, 135:3, 137:8, 143:12, 147:3, 156:1, 156:8, 156:13, 162:14, 171:13
beyond [2] - 50:21, 123:15
big [8] - 39:15, 40:5, 49:8, 49:10, 49:16, 65:15, 102:3, 103:1
bigger [5] - 101:20, 101:22, 101:24, 147:6, 147:19
billionth [2] - 147:18, 147:22
binding [2] - 23:5, 170:11
biochemical [1] - 68:21
biodegradation [1] - 39:18
biology [1] - 30:2
bit [17] - 35:19, 48:7, 56:21, 63:25, 67:16, 67:18, 99:9, 116:16, 134:22, 142:6, 143:16, 150:9, 164:24, 166:21, 171:12, 178:15
bits [1] - 100:22
black [8] - 7:14, 24:13, 60:24, 70:5, 84:20, 88:8, 143:1, 143:2
bleached [2] - 48:6, 48:11
blow [6] - 55:22, 104:22, 108:2, 109:12, 109:14, 121:5
blowing [2] - 104:24, 134:11
board [5] - 68:10, 138:3, 138:8, 139:23, 140:19
boat [3] - 75:24, 154:13, 162:16
BOCKIUS [1] - 3:15
BOD [1] - 68:21
bodies [1] - 44:5
body [3] - 69:3, 69:4, 76:11
book [1] - 140:9
books [1] - 140:9
boring [6] - 127:1, 127:10, 127:16, 128:1, 128:2, 128:22
borings [4] - 119:20, 127:15, 130:21, 130:23
bottom [18] - 24:14, 37:21, 38:1, 49:20, 80:11, 98:4, 98:9, 98:11, 98:13, 115:13, 138:22, 139:25, 144:23, 145:11, 155:16, 156:15, 169:14, 181:5
bounce [1] - 34:25
bound [2] - 74:4, 105:5
boundaries [3] - 106:8, 106:10, 108:19
boundary [3] - 106:13, 142:11, 143:3
BOX [1] - 2:19
box [2] - 46:10, 46:11
brainstorming [2] - 51:14, 51:15
breach [5] - 108:7, 112:5, 112:17, 116:12, 116:15
break [21] - 13:4, 25:17, 27:6, 27:8, 27:14, 27:15, 27:16, 27:18, 57:16, 68:23, 69:5, 77:25, 78:1, 78:6, 96:17, 99:22, 108:1, 108:2, 124:23, 132:18, 132:21
breaking [2] - 111:3, 183:7
breaks [2] - 48:2, 125:4
BRIAN [1] - 3:11
Brian [14] - 77:22, 104:22, 109:7, 110:17, 113:7, 115:17, 134:11, 141:12, 143:25, 146:4, 156:3, 160:11, 160:15, 163:6
Brian's [1] - 131:11
bridge [3] - 43:9,

145:20, 156:6
brief [1] - 97:18
briefly [7] - 15:6, 57:10, 84:1, 99:16, 111:19, 157:24, 175:12
bring [9] - 27:16, 32:20, 47:20, 57:17, 60:19, 62:24, 96:23, 112:19, 148:12
bringing [2] - 10:6, 126:8
broke [1] - 36:1
brought [2] - 59:17, 103:2
brown [3] - 70:5, 100:13, 153:14
BRUNS [1] - 3:5
building [1] - 113:4
built [1] - 35:6
bunch [1] - 160:16
burden [1] - 59:14
Burma [2] - 122:23, 180:21
burns [1] - 179:5
Burns' [3] - 179:2, 179:9, 179:12
burns' [1] - 179:18
butter [2] - 128:13, 128:14
buzz [1] - 13:4
BY [9] - 2:7, 2:14, 2:21, 3:8, 3:17, 3:23, 4:8, 97:8, 166:8

C

C-e-d-i-l-o-t-e [1] - 5:8
C-shape [1] - 44:22
calcium [1] - 56:23
calculate [3] - 19:17, 45:17, 46:3
calculated [2] - 46:13, 98:25
calculating [2] - 45:21, 67:22
calculations [4] - 65:14, 65:16, 67:9, 99:2
California [1] - 34:2
capacity [1] - 121:12
CAPITOL [1] - 2:19
carbonate [1] - 56:24
carbons [1] - 36:9
cardboard [13] - 48:17, 48:18, 67:18, 109:4, 109:5, 109:23, 110:4, 110:9, 110:12, 110:14, 110:22, 111:1, 125:3
care [5] - 10:17, 10:21, 95:16, 130:2, 150:22
career [1] - 29:5
careful [1] - 14:18
Caroline [2] - 1:19, 184:24
carried [2] - 72:19, 72:25
carries [1] - 62:11
carrying [1] - 172:8
Carter [1] - 92:10
CARTER [9] - 3:17, 21:24, 22:2, 22:6, 22:13, 25:7, 25:19, 92:24, 93:20
carton [2] - 109:4, 110:6
cartons [6] - 109:23, 110:4, 110:5, 110:9, 110:10, 110:12
case [79] - 11:1, 11:3, 11:5, 13:8, 15:8, 15:14, 16:4, 21:2, 21:4, 21:12, 24:2, 26:11, 32:15, 35:25, 40:6, 40:7, 41:1, 42:2, 42:4, 42:11, 50:11, 53:11, 57:5, 68:18, 69:20, 72:11, 73:17, 74:12, 74:25, 76:4, 79:6, 86:19, 87:8, 87:23, 91:19, 95:22, 96:19, 98:23, 99:4, 104:7, 105:1, 112:3, 116:19, 117:5, 120:24, 121:9, 124:10, 133:8, 133:18, 134:17, 137:1, 137:13, 138:15, 139:4, 140:12, 140:17, 155:6, 157:22, 159:2, 161:18, 162:1, 165:3, 166:13, 169:19, 170:5, 170:7, 170:11, 170:21, 171:18, 173:4, 173:20, 175:16, 175:23, 176:7, 181:22, 182:6, 182:10, 182:13, 182:23
cases [1] - 69:2
CAUSE [1] - 1:2
causing [1] - 93:5
caustic [1] - 47:24
ceased [2] - 86:15, 86:20
Cedilote [2] - 5:8, 6:16
center [3] - 31:9, 31:10, 31:13
central [4] - 33:25, 127:3, 127:7, 128:3
certain [7] - 11:23, 12:3, 32:11, 32:18, 63:6, 123:9, 142:23
certainly [8] - 104:7, 105:16, 107:8, 111:3, 113:3, 116:16, 144:21, 177:10
certify [2] - 184:5, 184:13
cetera [4] - 17:20, 36:2, 37:1, 109:23
chain [1] - 5:7
chair [1] - 32:1
chambers [1] - 184:11
Champion [39] - 42:20, 42:23, 42:25, 47:14, 47:15, 50:13, 53:12, 55:13, 55:23, 56:2, 72:14, 72:18, 76:7, 76:23, 89:18, 109:20, 120:12, 120:19, 120:22, 121:12, 122:11, 122:12, 123:13, 133:9, 166:13, 166:17, 167:19, 170:24, 171:6, 171:14, 173:2, 173:21, 177:25, 178:4, 178:6, 178:19, 179:21, 180:1, 180:15
Champion's [1] - 133:14
chance [2] - 80:14, 109:12
changed [3] - 58:16, 59:20, 60:1
Channel [5] - 75:19, 145:13, 154:7, 154:8, 155:21
characteristics [6] - 50:12, 68:15, 85:12, 87:6, 108:25, 124:13
characterization [1] - 160:23
characterized [1] - 51:16
charge [1] - 11:6
charges [1] - 83:20
chart [3] - 145:1, 148:2, 154:16
CHASE [1] - 2:5
chase [1] - 53:14
cheap [2] - 109:4, 110:20
cheaper [6] - 31:18, 54:19, 109:22, 110:3, 110:14, 110:22
chemical [9] - 35:7, 35:13, 35:24, 36:4, 37:14, 68:14, 117:7, 142:15, 144:13
chemicals [7] - 35:15, 47:25, 49:20, 117:18, 127:23, 159:24, 163:24
Chemosphere [1] - 39:17
Chesser [2] - 131:24, 131:25
chips [1] - 47:22
chlorinated [2] - 36:5, 36:6
chlorines [4] - 36:5, 36:10, 37:10, 164:15
chocolate [1] - 128:14
CHRIS [1] - 3:18
circles [3] - 157:14, 157:16, 160:17
circuiting [1] - 78:13
circular [1] - 127:17
citation [1] - 5:17
City [1] - 34:10
civil [4] - 28:19, 30:4, 31:22, 117:2
claim [1] - 84:9
claiming [1] - 85:11
claims [1] - 170:20
clarification [1] - 10:23
clarified [3] - 83:5, 92:15, 93:2
clarify [3] - 64:6, 93:22, 152:3
clay [16] - 119:25, 126:19, 127:25, 128:4, 128:20, 130:4, 130:10, 130:18, 131:2, 132:7, 132:10, 132:14, 134:24, 136:17, 169:15, 181:6
clean [3] - 31:15, 35:15, 40:3
cleaned [1] - 52:3
cleaning [6] - 13:19, 14:2, 31:19, 34:19, 35:9, 74:7
cleanup [2] - 34:15, 35:18
clear [16] - 11:12, 12:7, 13:5, 14:8, 16:7, 20:12, 24:18, 26:10, 59:10, 78:24, 79:4, 80:4, 100:14, 150:15, 151:21, 152:12
cleared [1] - 92:9
clearly [5] - 6:22, 22:10, 78:21, 80:12, 86:2
clears [1] - 16:3
closed [2] - 12:7, 126:7
closely [1] - 123:7
closer [2] - 54:23, 55:25
closing [1] - 15:17
co [2] - 31:11, 31:12
co-direct [1] - 31:11
co-director [1] - 31:12
Coast [2] - 33:25, 39:22
coast [1] - 40:4
coded [1] - 158:12
COLIN [1] - 3:10
collect [2] - 38:1, 156:20
collected [3] - 41:9, 54:2, 157:11
collects [1] - 37:20
college [2] - 30:2, 33:6
colloid [6] - 100:11, 101:13, 101:25, 102:3, 102:7, 114:17
colloidal [3] - 153:13, 155:3, 155:8
colloids [5] - 100:6, 100:22, 101:8, 101:21, 112:14
color [11] - 47:25, 70:2, 70:5, 71:7, 100:13, 100:16, 116:17, 118:4, 153:14, 158:10, 158:12
color-coded [1] - 158:12
colored [3] - 70:3, 70:6, 158:9
column [3] - 147:1, 149:11, 163:7
combination [1] - 20:9
coming [3] - 12:4, 60:22, 105:7
comment [2] - 9:16, 13:15
comments [6] - 6:17, 39:4, 39:6, 79:20, 149:18, 149:22
COMMISSION [1] -

1:5
communicate [1] - 132:1
communications [1] - 180:19
compacting [1] - 113:5
companies [2] - 89:12, 92:5
COMPANY [2] - 1:9, 3:14
company [4] - 73:3, 120:20, 122:23, 171:14
compare [7] - 5:11, 38:6, 62:16, 71:1, 71:3, 101:12, 106:16
compared [2] - 58:9, 149:14
compares [1] - 67:6
comparing [1] - 63:9
comparison [2] - 11:15, 102:6
compelled [1] - 13:22
complete [1] - 74:7
completely [8] - 14:20, 81:22, 99:24, 100:8, 105:16, 114:3, 139:9, 139:19
completion [1] - 98:19
complicated [1] - 159:9
complies) [2] - 97:24, 119:12
comply [1] - 172:22
composed [2] - 169:15, 181:6
composition [4] - 57:23, 58:5, 59:8, 60:11
compound [2] - 36:8, 37:18
compounds [1] - 100:18
compressed [1] - 48:10
compresses [1] - 52:9
computer [1] - 1:21
computer-assisted [1] - 1:21
computerized [1] - 1:21
concentration [4] - 146:25, 156:22, 164:22, 164:25
concentrations [10] - 149:23, 153:8, 154:8, 154:22, 157:3, 161:15, 162:6, 162:21, 165:8, 165:16
concept [3] - 124:17, 124:19, 149:1
concepts [1] - 125:6
concern [6] - 23:24, 26:4, 93:21, 93:25, 94:8, 151:2
concerned [2] - 15:8, 26:2
concerns [1] - 14:25
concluded [1] - 56:19
concluding [1] - 135:25
conclusion [4] - 118:22, 118:24, 170:13, 170:15
conclusions [1] - 55:2
conduct [2] - 5:12, 175:17
conducted [6] - 6:4, 26:22, 39:20, 64:14, 123:3, 140:15
confer [1] - 79:23
conference [1] - 176:3
conferring [1] - 152:14
confirm [3] - 63:12, 73:9, 111:25
confirmation [1] - 99:2
confirmed [2] - 98:6, 121:22
confirming [1] - 90:15
confirms [1] - 73:20
conflict [5] - 58:1, 59:2, 59:8, 59:15, 59:17
confluence [1] - 154:7
confuse [2] - 26:25, 27:10
confusion [1] - 79:2
CONGRESS [1] - 2:12
connect [1] - 23:23
connected [1] - 179:6
CONNECTICUT [1] - 3:21
connection [4] - 76:3, 136:3, 140:6, 172:21
connects [1] - 143:10
CONNELLY [1] - 2:4
consequently [1] - 126:15
consider [3] - 23:12, 136:13, 174:11
considered [2] - 36:12, 89:7
consisted [1] - 119:24
consistency [3] - 51:18, 109:3, 123:21
consistent [12] - 8:12, 13:8, 14:24, 16:1, 69:22, 74:11, 116:17, 126:17, 128:21, 129:1, 129:12, 165:2
consists [1] - 89:20
constructed [14] - 26:18, 70:24, 125:23, 125:24, 126:6, 129:19, 130:17, 132:11, 132:16, 134:2, 135:5, 135:6, 174:15, 174:18
construction [9] - 73:3, 119:19, 120:5, 120:6, 120:20, 126:9, 133:22, 133:24, 171:14
consultants [3] - 41:11, 127:2, 130:22
contact [6] - 126:22, 131:25, 153:9, 153:20, 159:23, 162:7
contain [1] - 132:3
contained [7] - 5:13, 68:21, 138:14, 139:22, 143:8, 158:11, 165:17
container [1] - 38:2
containment [1] - 100:2
contains [1] - 184:6
contaminate [1] - 35:2
contaminated [3] - 34:21, 100:5, 159:21
contemporaneous [1] - 168:15
contemporary [1] - 126:24
content [15] - 62:10, 62:17, 63:7, 63:11, 63:16, 64:3, 64:17, 65:4, 65:10, 66:20, 66:24, 67:13, 125:15, 125:18, 125:19
contention [1] - 25:9
context [2] - 57:6, 149:6
continue [5] - 63:21, 121:18, 123:7, 133:3, 152:19
continues [1] - 137:4
continuous [1] - 49:6
contract [12] - 21:6, 21:11, 120:19, 121:15, 171:13, 172:16, 177:25, 178:5, 178:16, 179:22, 180:2, 180:17
contracting [1] - 178:24
contractor [18] - 21:7, 45:20, 120:21, 123:13, 135:13, 135:17, 172:5, 172:6, 172:7, 172:10, 172:15, 172:19, 178:6, 178:7, 180:19, 180:22, 180:25, 181:13
contractors [1] - 123:9
Control [2] - 174:21, 182:24
control [2] - 24:11, 122:12
controls [1] - 36:13
controversial [1] - 32:15
conversation [4] - 53:2, 178:19, 179:23, 180:16
conversations [1] - 182:14
cooker [1] - 47:22
coordinate [3] - 31:3, 33:23, 34:3
coordinating [2] - 34:14, 34:17
copies [2] - 13:15, 176:13
copious [1] - 94:18
copy [11] - 21:22, 28:21, 71:17, 71:19, 122:3, 133:13, 138:12, 157:18, 176:19, 176:20, 184:6
COPY [1] - 1:14
core [1] - 127:17
corner [1] - 145:11
CORP [1] - 4:4
Corp [1] - 73:3
corporate [10] - 23:3, 23:6, 25:2, 25:7, 140:6, 170:6, 170:10, 173:7, 173:9, 173:19
corporation [4] - 138:17, 140:2, 140:5, 140:14
CORPORATION [1] - 1:10
Corporation [1] - 72:20
corporation's [1] - 140:8
correct [43] - 8:10, 33:3, 42:8, 42:9, 45:10, 45:16, 46:23, 54:10, 54:11, 54:14, 55:12, 58:7, 61:23, 63:14, 64:12, 65:22, 67:1, 67:24, 70:9, 71:14, 71:15, 72:5, 98:10, 101:9, 111:18, 130:16, 139:21, 141:19, 145:4, 161:7, 167:5, 168:9, 169:23, 170:21, 171:2, 171:9, 174:22, 176:11, 177:5, 177:8, 180:11, 183:4, 184:6
correctly [1] - 184:14
correspond [1] - 142:3
correspondence [1] - 40:13
cost [3] - 34:17, 55:1, 140:10
costs [2] - 54:5, 54:24
COUNSEL [5] - 2:3, 2:17, 3:4, 3:14, 4:3
counsel [12] - 5:10, 7:14, 8:2, 8:25, 13:13, 85:4, 87:16, 93:16, 137:21, 166:3, 173:11, 184:8
counsel's [2] - 9:11, 81:3
count [1] - 156:12
country [2] - 31:17, 34:17
county [1] - 170:11
COUNTY [6] - 1:4, 1:8, 2:3, 2:11, 2:14, 184:1
County [41] - 1:20, 5:6, 7:15, 8:15, 8:20, 9:9, 9:10, 10:9, 12:15, 14:25, 15:13, 16:9, 16:18, 23:6, 24:22, 28:2, 79:1, 95:9, 117:5, 170:6, 170:19, 170:21, 170:24, 173:1, 173:19, 174:1, 174:21, 176:8, 177:4, 178:6, 178:8, 179:23, 180:16, 182:1, 182:6, 182:12, 182:16, 182:17, 182:23,

184:4, 184:23
County's [3] - 27:1, 173:6, 181:23
couple [9] - 7:9, 15:7, 39:19, 50:2, 52:11, 101:14, 125:16, 134:21, 140:25
course [5] - 7:16, 9:7, 33:6, 114:11, 159:5
Court [4] - 184:3, 184:4, 184:22, 184:23
COURT [178] - 1:2, 1:4, 5:3, 5:25, 6:20, 6:24, 7:7, 8:6, 8:12, 9:5, 9:8, 9:24, 11:4, 11:10, 11:19, 12:18, 12:21, 13:3, 13:6, 14:4, 14:12, 14:15, 15:5, 15:10, 15:19, 15:24, 16:15, 16:23, 17:2, 18:15, 18:21, 19:8, 19:11, 19:23, 20:12, 20:20, 20:23, 21:16, 22:17, 22:22, 23:13, 23:22, 24:16, 24:18, 24:24, 25:1, 25:16, 26:1, 26:12, 27:3, 27:12, 27:20, 28:4, 28:12, 50:9, 50:19, 50:25, 55:20, 57:11, 57:15, 57:20, 58:4, 58:8, 58:18, 58:25, 59:16, 59:24, 60:7, 60:9, 60:17, 61:2, 61:6, 61:12, 62:20, 62:23, 63:8, 63:14, 63:17, 63:20, 64:8, 68:8, 76:16, 77:18, 77:24, 78:4, 78:18, 79:7, 79:12, 80:3, 81:11, 81:20, 81:24, 82:6, 82:9, 82:19, 82:22, 83:8, 84:4, 84:18, 85:16, 85:22, 85:25, 86:5, 86:9, 86:25, 87:2, 87:22, 88:3, 88:20, 89:2, 89:4, 89:10, 89:17, 89:22, 90:2, 90:8, 90:24, 91:3, 91:7, 91:9, 91:12, 91:17, 91:24, 92:15, 92:25, 93:18, 93:24, 94:17, 94:23, 95:3, 96:3, 96:11, 96:16, 96:18, 96:23, 97:1, 102:20, 102:25, 103:18, 115:3, 118:23, 119:1, 122:6, 123:17, 129:3, 129:15, 131:13, 132:20, 133:1, 136:23, 137:7, 137:21, 138:1, 138:10, 141:4, 148:7, 148:11, 148:15, 148:21, 149:10, 149:24, 150:7, 150:14, 150:20, 150:24, 151:10, 152:1, 152:8, 152:10, 152:15, 152:18, 157:20, 166:3, 170:14, 173:11, 173:15, 176:22, 183:8
court [16] - 7:18, 10:10, 11:21, 12:1, 27:8, 33:16, 78:14, 78:15, 78:16, 79:4, 81:10, 84:21, 87:12, 96:2, 176:5, 184:11
Court's [2] - 7:5, 18:24
court's [4] - 7:10, 11:5, 11:11, 151:7
courtroom [3] - 57:19, 117:10, 176:3
cover [1] - 173:8
covered [2] - 72:17, 172:22
CRAIG [1] - 3:18
create [1] - 14:21
created [1] - 19:21
creates [1] - 13:20
credited [1] - 174:25
criticisms [1] - 169:21
criticize [1] - 39:4
CROSS [1] - 166:7
CROSS-EXAMINATION [1] - 166:7
CRUTCHER [1] - 3:21
CSR [1] - 184:21
cubic [10] - 46:7, 46:8, 46:9, 46:19, 49:25, 74:4, 74:8, 121:10, 121:16, 121:19
cup [1] - 128:13
cured [1] - 94:8
current [2] - 90:14, 114:12
cut [2] - 168:5, 168:8
cutting [1] - 23:10
CV [4] - 28:22, 28:23, 30:11, 31:8

D

D.C [1] - 3:22
DAILY [1] - 1:14
daily [5] - 8:11, 56:9, 99:15, 100:7, 184:6
Dam [2] - 141:24, 154:7
damage [1] - 135:8
danger [1] - 159:23
DANIEL [1] - 3:23
data [11] - 41:8, 62:14, 64:13, 126:25, 129:1, 129:9, 129:11, 145:12, 157:11, 158:11
Date [1] - 184:22
date [17] - 64:6, 64:8, 86:13, 90:17, 97:25, 105:9, 107:21, 115:24, 116:15, 118:19, 133:22, 135:5, 140:18, 157:15, 171:21, 178:3, 181:19
dated [3] - 17:18, 55:5, 133:13
dates [7] - 59:3, 72:24, 73:7, 73:8, 73:9, 90:17, 97:19
datum [1] - 142:23
David [1] - 166:9
DAVID [2] - 2:8, 3:19
day's [2] - 52:16, 52:17
day-to-day [1] - 37:17
days [1] - 49:7
deal [4] - 49:8, 49:9, 49:10, 58:25
dealing [1] - 79:10
deals [1] - 79:24
dealt [4] - 27:23, 79:5, 79:16, 97:2
DEBRA [1] - 2:8
decade [1] - 55:8
December [8] - 84:14, 88:7, 132:9, 133:8, 133:13, 133:20, 135:8
decide [2] - 27:5, 95:11
decided [1] - 78:6
decision [3] - 32:16, 40:17, 78:16
decisions [1] - 33:10
deep [4] - 46:18, 127:20, 158:15
deepwater [1] - 40:1
defendant [1] - 5:10
DEFENDANT [3] - 3:4, 3:14, 4:3
Defendants [1] - 1:11
defendants [4] - 6:10, 14:16, 57:24, 94:13
defendants' [1] - 95:10
Defendants' [4] - 5:7, 17:11, 81:5, 180:9
defined [2] - 83:4, 83:9
definition [1] - 38:5
degraded [1] - 36:1
degree [1] - 30:2
deleted [1] - 87:19
deliberately [1] - 83:19
demand [2] - 68:22, 71:7
department [3] - 97:19, 122:11, 122:12
Department [7] - 71:13, 73:15, 76:21, 97:11, 109:9, 111:15, 167:4
deposited [1] - 157:8
deposition [7] - 25:5, 148:20, 170:10, 175:21, 176:13, 176:18, 176:25
depositions [2] - 175:13, 176:7
depth [3] - 54:24, 56:1, 161:11
describe [6] - 29:18, 34:23, 36:3, 139:6, 152:4, 152:25
described [4] - 75:10, 109:3, 110:3, 110:21
describes [3] - 72:13, 73:18, 111:15
describing [2] - 130:23, 168:15
design [5] - 173:25, 174:3, 174:4, 175:10, 177:5
designated [4] - 173:6, 173:8, 173:9, 181:22
detail [1] - 99:17
details [2] - 55:1, 119:20
determine [3] - 42:11, 160:4, 172:8
determining [2] - 5:12, 108:7
develop [7] - 31:18, 34:15, 34:18, 40:15, 40:17, 99:5, 122:23
developed [4] - 25:12, 25:13, 35:13, 35:18
developing [1] - 179:9
developments [1] - 123:7
diagram [2] - 70:13, 127:4
diagrams [1] - 41:4
dibenzodioxin [1] - 164:15
difference [8] - 28:24, 44:7, 58:10, 107:17, 117:16, 137:7, 150:4, 150:5
differences [1] - 147:5
different [34] - 12:18, 12:21, 20:24, 23:13, 38:16, 38:24, 40:21, 45:24, 54:7, 66:7, 66:8, 78:9, 101:5, 101:10, 101:11, 106:4, 118:8, 124:17, 124:19, 125:2, 125:6, 128:4, 144:2, 147:3, 151:3, 160:24, 160:25, 161:5, 161:6, 163:17, 163:19, 163:23, 163:25
differently [1] - 67:16
dikes [4] - 132:2, 132:6, 169:15, 181:6
dioxin [78] - 8:8, 8:16, 12:15, 12:20, 13:15, 34:5, 34:13, 35:24, 36:3, 36:19, 36:22, 36:24, 37:3, 37:6, 37:7, 37:11, 38:7, 38:11, 40:20, 99:7, 99:13, 99:19, 100:5, 100:9, 100:16, 104:7, 111:6, 111:8, 111:17, 112:14, 114:7, 114:14, 114:16, 117:8, 118:13, 140:23, 142:15, 142:16, 144:3, 144:4, 144:6, 144:9, 144:21, 146:25, 147:13, 147:24, 148:3, 149:20, 150:19, 151:24, 152:23, 153:2, 153:6, 153:7, 153:9, 153:15, 154:1, 154:15, 155:1, 155:11, 156:17, 156:22, 158:1, 160:5, 161:15, 162:7, 162:12, 162:13,

162:16, 164:1, 164:4, 164:5, 164:7, 164:9, 164:16, 164:25, 165:8, 165:10
dioxin-contaminated [1] - 100:5
dioxins [2] - 149:4, 163:25
DIRECT [1] - 28:15
direct [5] - 31:11, 167:23, 168:25, 171:13, 179:16
directly [10] - 17:3, 84:13, 84:14, 92:6, 92:20, 93:9, 94:14, 175:9, 177:4, 180:19
director [5] - 30:12, 30:16, 31:2, 31:12, 174:20
directors [2] - 139:23, 140:19
disappear [1] - 69:6
disappeared [3] - 113:25, 114:1, 134:4
disapproval [1] - 179:17
discharge [12] - 69:25, 76:11, 83:1, 83:12, 84:12, 84:22, 90:19, 91:16, 91:22, 92:20, 93:9, 94:13
discharged [2] - 52:13, 92:5
discharges [1] - 82:18
discharging [7] - 76:24, 77:9, 80:18, 84:14, 92:11, 94:22, 95:12
discovery [1] - 175:17
discuss [1] - 76:6
discussed [7] - 15:7, 16:24, 61:21, 80:16, 132:18, 149:6, 178:22
discusses [1] - 56:11
discussing [3] - 53:16, 53:19, 80:24
discussion [22] - 18:24, 57:12, 76:17, 77:19, 79:23, 81:12, 84:8, 84:21, 85:24, 87:3, 88:2, 89:24, 94:18, 119:5, 124:9, 124:10, 132:23, 137:23, 138:16, 148:8, 166:4, 173:12
discussions [1] - 135:16
disintegrate [2] - 132:11, 132:15
displayed [2] - 81:16, 83:25
disposal [23] - 22:3, 22:7, 51:14, 54:6, 54:8, 54:10, 54:18, 54:20, 54:25, 68:11, 72:18, 84:9, 89:13, 89:14, 89:18, 90:4, 90:11, 110:2, 122:18, 123:8, 133:14, 136:3, 179:17
dispose [4] - 55:15, 92:18, 177:12, 178:24
disposed [3] - 54:3, 73:13, 158:4
disposing [1] - 179:3
dispute [8] - 22:8, 22:11, 78:23, 81:18, 87:4, 90:20, 93:5, 95:21
dissolve [1] - 37:21
dissolved [19] - 38:4, 71:8, 114:17, 144:3, 144:7, 147:10, 148:2, 153:7, 153:9, 153:11, 154:15, 155:2, 155:5, 155:6, 155:7, 155:9, 155:12, 165:10, 165:24
dissolving [2] - 38:2, 112:14
distance [1] - 54:20
distant [1] - 54:18
distracted [1] - 117:15
District [2] - 184:4, 184:23
DISTRICT [2] - 1:4, 1:11
DIVISION [1] - 2:18
doctor [8] - 61:12, 62:23, 76:20, 115:18, 133:2, 133:6, 135:12, 138:6
document [83] - 5:13, 5:18, 5:25, 6:13, 6:15, 9:6, 18:5, 18:10, 18:16, 19:19, 20:15, 21:13, 21:18, 21:23, 22:21, 25:18, 26:5, 27:15, 50:20, 51:8, 51:10, 55:5, 55:10, 55:24, 56:2, 56:4, 56:11, 57:22, 59:2, 60:16, 64:9, 65:21, 65:23, 66:19, 74:15, 76:22, 77:15, 78:15, 79:23, 80:9, 81:2, 81:4, 81:21, 82:24, 82:25, 84:4, 85:8, 85:10, 86:14, 87:8, 87:14, 88:21, 94:21, 97:7, 97:8, 102:10, 102:11, 102:14, 111:15, 120:16, 122:2, 122:7, 122:9, 122:15, 131:15, 134:6, 135:5, 136:7, 136:22, 137:3, 137:4, 137:8, 141:13, 142:13, 142:14, 167:4, 168:15, 168:21, 171:22, 176:23, 178:14
documentary [1] - 132:19
documents [55] - 7:14, 9:2, 9:4, 9:11, 9:13, 9:15, 9:19, 9:20, 10:3, 17:8, 20:5, 20:9, 20:13, 20:21, 20:22, 23:19, 26:15, 40:12, 40:24, 41:2, 50:6, 51:1, 53:7, 53:11, 57:4, 58:9, 59:5, 59:9, 60:10, 60:23, 65:19, 70:23, 73:19, 74:16, 74:25, 80:4, 81:8, 82:10, 83:19, 87:17, 103:14, 108:23, 111:14, 112:21, 120:2, 120:8, 126:12, 128:22, 137:10, 137:13, 140:16, 140:25, 169:2, 171:17
domestic [1] - 69:10
donated [1] - 32:2
done [29] - 6:12, 13:17, 13:18, 29:4, 34:20, 41:10, 41:17, 56:16, 57:25, 59:12, 71:2, 71:13, 71:21, 73:2, 83:7, 84:24, 88:9, 88:10, 98:1, 98:20, 104:8, 104:9, 104:10, 121:4, 127:1, 172:14, 175:13, 181:10
door [8] - 7:13, 9:15, 11:2, 13:23, 13:25, 14:6, 14:13, 94:3
down [36] - 17:21, 18:18, 19:2, 36:1, 48:2, 49:8, 49:17, 51:24, 52:11, 52:15, 53:22, 63:25, 68:23, 69:5, 72:15, 74:2, 75:25, 77:14, 77:23, 95:18, 103:16, 103:19, 105:7, 114:15, 114:16, 115:18, 115:19, 125:4, 127:20, 132:22, 142:23, 145:11, 153:10, 154:7, 175:24, 178:3
downstream [2] - 149:14, 154:6
dozen [1] - 42:6
Dr [55] - 8:6, 8:7, 12:25, 22:24, 23:2, 26:17, 28:4, 28:18, 60:19, 61:9, 61:17, 63:9, 74:20, 82:20, 88:22, 95:6, 96:6, 96:24, 97:9, 103:16, 109:17, 116:22, 116:23, 117:8, 117:10, 117:13, 117:17, 128:7, 128:15, 130:14, 131:19, 137:1, 140:21, 141:13, 152:14, 165:22, 165:25, 166:9, 168:11, 169:8, 173:2, 173:18, 174:5, 175:8, 176:20, 177:3, 177:11, 178:20, 178:23, 179:11, 179:23, 180:3, 180:11, 180:18, 180:25
draft [4] - 95:24, 96:2, 96:4
dragon [1] - 106:3
drained [2] - 54:12, 54:17
drawings [2] - 120:5, 120:6
drawn [1] - 55:3
dredge [3] - 75:17, 75:23, 75:24
dredging [1] - 13:11
dried [1] - 109:22
drill [5] - 159:12, 159:22, 160:24, 161:2, 161:18
drink [1] - 158:23
drinking [3] - 159:12, 159:15, 159:22
drop [1] - 67:7
drove [1] - 162:16
dry [1] - 64:14
duly [1] - 28:14
dump [5] - 35:7, 139:10, 139:20, 140:6, 140:7
dumping [3] - 54:22, 55:24, 136:13
DUNN [1] - 3:21
during [17] - 62:13, 68:11, 91:18, 93:22, 93:25, 95:6, 98:25, 99:18, 99:21, 112:25, 113:13, 113:23, 117:20, 119:21, 126:15, 127:2, 135:15

E

e-mail [1] - 5:7
early [1] - 116:1
earnest [2] - 5:15, 23:9
EARNEST [1] - 2:7
earthen [2] - 44:3, 119:10
easel [2] - 102:23, 103:1
easier [2] - 37:3, 96:1
easily [1] - 100:19
eastern [1] - 104:13
educational [1] - 29:3
effect [3] - 15:13, 69:21, 172:20
effects [1] - 29:21
efficient [1] - 132:18
efforts [1] - 40:5
egg [7] - 109:23, 110:4, 110:5, 110:9, 110:12
eggshell [1] - 109:4
either [9] - 38:21, 39:5, 54:19, 70:21, 93:18, 112:12, 114:17, 153:3
elevated [5] - 71:6, 162:6, 162:12, 164:25, 165:15
elevation [1] - 105:2
elevations [1] - 103:12
eliminated [1] - 140:8
Elizabeth [1] - 31:22
Elmo [1] - 141:2
elsewhere [1] - 154:23
employed [1] - 182:1
employment [1] - 29:4
emptying [1] - 135:13
end [7] - 32:10, 48:16, 49:5, 49:11, 99:14,

180:3
ended [2] - 22:7, 130:9
endowed [1] - 32:1
engineer [4] - 29:24, 103:8, 107:11, 117:2
engineering [14] - 28:20, 29:15, 29:17, 29:19, 30:4, 31:22, 33:6, 33:24, 34:2, 38:14, 39:21, 111:12, 122:22, 122:23
Engineering [1] - 180:22
engineers [1] - 33:7
enter [1] - 169:17
entered [4] - 177:25, 178:4, 178:16, 180:18
enters [2] - 179:21, 180:2
entire [2] - 85:9, 136:2
entirely [1] - 85:11
entities [1] - 30:18
entitled [6] - 1:18, 15:14, 15:18, 16:12, 16:16, 16:21
entity [1] - 76:8
environment [8] - 29:21, 29:22, 36:2, 36:25, 37:11, 49:14, 110:24, 163:24
environmental [14] - 28:19, 29:17, 29:19, 29:24, 31:22, 33:24, 34:2, 38:14, 39:16, 39:20, 103:8, 107:11, 111:12, 117:2
ENVIRONMENTAL [2] - 1:6, 2:18
environments [1] - 129:6
EPA [6] - 6:4, 6:7, 14:10, 14:19, 143:3, 149:1
episode [1] - 88:8
equipment [3] - 110:1, 179:12, 179:13
erode [2] - 114:14, 140:23
eroded [2] - 108:19, 129:25
eroding [1] - 134:2
erosion [4] - 113:14, 114:4, 126:23, 134:6
escape [1] - 169:16
escaped [2] - 152:23, 153:2
escaping [1] - 150:19
especially [1] - 95:7
essentially [7] - 32:14, 49:24, 51:13, 56:23, 104:12, 106:1, 114:2
establish [5] - 25:23, 91:15, 123:4, 159:20, 165:4
established [6] - 22:3, 59:23, 74:6, 103:13, 105:3, 143:3
establishes [3] - 104:19, 120:25, 123:12
establishing [1] - 123:11
estate [1] - 140:4
et [4] - 17:20, 36:2, 37:1, 109:23
evaluate [1] - 32:10
Evening [1] - 183:13
event [1] - 165:14
eventually [2] - 37:20, 177:25
everywhere [1] - 92:12
evidence [30] - 7:15, 7:20, 7:23, 8:15, 8:20, 8:24, 9:10, 9:18, 10:14, 10:24, 10:25, 11:2, 12:14, 12:17, 12:24, 13:9, 15:2, 22:14, 22:15, 22:17, 58:5, 84:16, 87:8, 87:23, 96:7, 96:19, 102:10, 142:15, 184:7, 184:16
evidentiary [2] - 10:19, 27:23
exactly [7] - 5:9, 47:9, 88:18, 129:22, 147:8, 161:1, 177:17
exam [1] - 167:23
examination [3] - 71:11, 169:1, 171:13
EXAMINATION [2] - 28:15, 166:7
example [8] - 12:14, 30:24, 30:25, 41:13, 44:6, 114:7, 126:22, 159:22
examples [1] - 35:21
excavation [1] - 75:15
excess [4] - 84:8, 85:24, 90:3, 90:10
exchange [2] - 114:18, 153:10
exclude [1] - 9:18
excluded [3] - 7:17, 11:3, 84:21
excluding [1] - 7:21
exclusively [1] - 130:5
excursion [1] - 26:25
excuse [3] - 22:6, 88:10, 139:14
Exhibit [73] - 5:7, 7:19, 18:11, 24:7, 29:1, 43:3, 43:5, 50:23, 51:5, 51:7, 53:1, 55:14, 57:6, 61:18, 61:23, 62:4, 63:25, 65:5, 68:6, 70:18, 71:16, 71:19, 71:22, 71:25, 72:9, 73:22, 73:25, 76:2, 76:12, 79:21, 81:5, 81:7, 83:5, 83:24, 85:4, 89:9, 96:20, 97:6, 102:11, 103:21, 105:13, 105:23, 107:2, 109:8, 109:15, 115:17, 115:21, 120:14, 122:1, 127:5, 131:10, 133:5, 135:10, 136:6, 137:15, 138:3, 138:14, 139:12, 141:6, 141:11, 143:9, 153:23, 165:19, 166:23, 169:4, 169:5, 171:11, 178:12, 180:7, 180:8, 180:9
exhibit [13] - 5:22, 17:21, 25:25, 60:12, 69:19, 70:14, 85:20, 110:18, 133:7, 133:17, 133:23, 162:18, 166:24
exhibits [7] - 18:24, 19:1, 19:6, 78:10, 79:2, 97:3, 184:15
existence [1] - 22:12
existing [1] - 89:14
expect [1] - 131:3
experience [3] - 111:1, 174:9, 174:25
experiments [2] - 38:20, 38:21
expert [19] - 12:9, 21:1, 25:9, 33:8, 58:16, 58:19, 60:14, 93:4, 95:19, 96:9, 96:12, 116:19, 117:9, 137:19, 170:5, 174:11, 176:10, 176:17, 176:25
expertise [2] - 50:18, 123:15
experts [2] - 39:3, 95:8
Expiration [1] - 184:22
explain [6] - 46:14, 82:5, 117:3, 124:18, 151:8, 151:18
explains [2] - 68:19, 162:11
extensive [1] - 5:23
extent [2] - 96:6, 170:13
extra [1] - 176:13
extrapolate [1] - 20:17
extrapolating [1] - 59:7
eye [2] - 9:22, 100:15

F

f) [1] - 172:18
facility [3] - 17:17, 17:19, 18:19
fact [15] - 10:13, 10:15, 12:7, 14:16, 84:10, 92:10, 95:4, 100:4, 127:10, 130:9, 149:3, 162:9, 180:6, 181:22, 182:5
factor [1] - 147:4
faculty [1] - 30:23
fairness [2] - 10:9, 25:24
fall [1] - 107:7
falling [1] - 126:14
false [2] - 13:20, 14:22
familiar [8] - 78:14, 102:11, 115:22, 115:24, 120:16, 122:2, 128:6, 131:14
far [2] - 17:21, 42:3
farmer [1] - 56:18
faster [1] - 31:19
fate [1] - 142:15
fathom [2] - 54:24, 55:25
fault [1] - 160:10
favor [1] - 39:11
Feasibility [1] - 141:16
feature [1] - 114:16
February [1] - 116:1
federal [6] - 13:19, 14:2, 14:8, 14:9, 30:22, 172:23
feet [9] - 46:12, 105:4, 105:6, 158:24, 160:8, 161:12
felt [1] - 94:5
fertilizer [4] - 56:17, 56:19, 56:20, 62:12
few [3] - 30:11, 61:14, 169:7
fiber [1] - 57:2
fibers [5] - 48:5, 48:8, 48:15, 49:18, 69:17
fibrous [4] - 52:20, 67:15, 109:1, 109:22
field [5] - 34:14, 38:13, 38:22, 39:15, 111:12
figure [29] - 46:14, 65:21, 67:8, 115:20, 116:2, 116:9, 116:10, 121:10, 123:1, 125:14, 141:6, 143:8, 144:19, 147:11, 149:16, 149:25, 152:4, 152:11, 157:17, 157:22, 157:24, 158:11, 160:1, 162:19, 162:23, 163:10, 164:18, 165:18, 165:19
figures [2] - 67:20, 67:21
figuring [1] - 45:22
fill [3] - 33:17, 53:18, 181:19
filled [10] - 26:21, 46:21, 46:22, 53:21, 74:21, 98:14, 98:24, 99:1, 139:9, 139:19
filling [2] - 55:6, 55:10
filter [3] - 156:19, 156:20, 156:21
filtration [2] - 66:10, 66:13
final [5] - 9:16, 13:13, 131:18, 135:10
finally [4] - 73:12, 113:17, 135:24, 179:16
findings [1] - 149:1
fine [6] - 15:3, 30:11, 50:20, 61:6, 61:7, 92:6
finish [3] - 84:19, 86:25, 183:6
finished [4] - 23:9, 30:5, 90:21, 135:13
firm [1] - 21:8
FIRST [1] - 2:14
first [68] - 5:5, 6:15, 7:12, 18:10, 22:3, 24:20, 25:10, 25:12, 27:11, 27:14, 27:25,

30:12, 32:7, 38:24, 40:18, 44:14, 52:1, 52:4, 52:25, 53:24, 56:15, 56:23, 59:23, 62:9, 68:5, 71:3, 72:12, 73:1, 75:11, 78:18, 81:21, 82:9, 85:10, 89:8, 89:15, 89:16, 97:5, 98:15, 98:22, 99:9, 103:21, 103:24, 104:23, 105:13, 107:25, 109:8, 109:9, 109:10, 109:14, 110:19, 113:14, 114:2, 115:21, 116:11, 120:20, 122:1, 122:25, 127:12, 133:12, 142:4, 142:12, 142:18, 144:1, 167:2, 167:12, 168:1, 169:11, 169:13
fish [2] - 69:6, 71:9
five [4] - 5:18, 7:1, 106:23, 106:24
five-volume [1] - 5:18
flash [1] - 108:5
floating [2] - 68:16, 101:17
Floor [1] - 184:24
floor [1] - 115:13
FLOOR [2] - 2:12, 4:6
flowing [1] - 100:8
fly [1] - 165:11
focus [4] - 11:8, 12:11, 86:13, 142:2
focused [1] - 160:6
focuses [1] - 10:20
folks [1] - 147:14
follow [3] - 88:6, 88:7, 146:9
follow-up [2] - 88:6, 88:7
following [16] - 1:19, 12:1, 19:1, 27:19, 57:14, 61:10, 64:15, 76:18, 77:20, 90:1, 96:17, 132:25, 137:24, 148:9, 166:6, 173:14
follows [1] - 28:14
footnote [2] - 149:9, 149:15
footprint [1] - 113:23
FOR [5] - 2:3, 2:17, 3:4, 3:14, 4:3
foregoing [1] - 184:6
forever [1] - 102:7
form [8] - 33:17, 114:17, 123:3, 124:17, 153:7, 153:11, 153:12, 164:11
formed [3] - 18:4, 21:11, 21:15
forming [6] - 98:23, 104:4, 104:25, 133:7, 133:18, 171:18
forms [1] - 45:25
formulate [4] - 50:11, 50:12, 74:16, 139:4
formulated [1] - 137:2
formulating [13] - 56:5, 69:19, 72:10, 72:23, 73:6, 73:17, 73:23, 97:15, 98:7, 120:24, 157:22, 162:9, 164:3
forth [2] - 40:14, 52:17
forward [2] - 9:22, 97:3
foundation [22] - 22:20, 22:23, 23:19, 23:21, 23:23, 24:6, 25:14, 25:17, 25:21, 25:22, 27:7, 27:15, 50:18, 58:15, 59:11, 59:23, 60:2, 60:4, 60:5, 60:18, 63:6, 82:8
foundational [1] - 83:22
four [4] - 40:5, 106:23, 106:24, 164:14
fourth [2] - 60:24, 163:21
fraction [2] - 37:24, 155:8
frame [4] - 10:8, 10:9, 104:5, 174:14
freedom [2] - 32:15, 32:19
freely [1] - 78:11
Friday [1] - 183:9
front [2] - 61:18, 121:4
full [6] - 80:13, 91:6, 98:15, 139:9, 158:21, 172:7
fully [1] - 55:2
furthermore [1] - 54:22
future [1] - 121:18

G

gallons [1] - 49:1
gelatin [1] - 66:5
GENERAL [2] - 2:18, 2:21
general [9] - 11:5, 16:20, 41:16, 47:19, 68:14, 72:12, 72:16, 102:2, 177:14
generalizing [1] - 164:10
generally [10] - 40:7, 42:10, 50:6, 53:17, 71:2, 71:4, 71:20, 90:18, 100:16, 144:1
generated [1] - 20:3
gentlemen [7] - 27:23, 57:15, 77:24, 97:2, 132:21, 148:11, 183:8
geoprobes [1] - 127:19
GEORGE [1] - 2:8
GIBBS [2] - 3:5, 3:8
GIBSON [1] - 3:21
gist [1] - 56:22
GIUGLIANO [3] - 3:9, 148:24, 149:17
given [10] - 8:5, 8:9, 23:6, 87:19, 104:14, 119:20, 129:17, 131:23, 174:24
government [5] - 13:19, 14:2, 15:12, 30:23, 76:8
governmental [1] - 172:22
grade [4] - 109:22, 110:3, 110:14, 110:22
gram [3] - 147:16, 147:18, 147:22
graph [14] - 142:6, 142:24, 143:10, 143:22, 144:2, 147:1, 147:5, 151:23, 152:4, 154:25, 155:14, 159:18, 159:19, 164:21
graphs [2] - 162:12, 164:23
GRAY [9] - 4:8, 26:16, 50:17, 58:14, 60:22, 61:3, 62:25, 63:12, 77:16
Gray [1] - 27:4
great [5] - 51:24, 79:1, 106:6, 155:3, 183:12
green [2] - 106:12, 108:17
ground [9] - 35:11, 66:18, 66:23, 125:16, 127:21, 158:24, 158:25, 161:12, 161:21
groundwater [9] - 158:14, 158:19, 158:22, 159:14, 159:15, 159:20, 160:7, 160:17, 163:1
group [1] - 73:10
Guam [1] - 30:19
guess [3] - 8:19, 10:23, 42:4
guidance [2] - 33:14, 151:8
guidelines [1] - 70:1
Gulf [2] - 33:25, 39:22

H

half [3] - 75:3, 134:3, 134:20
Hall's [5] - 86:17, 87:14, 88:4, 88:5, 88:9
hamstring [1] - 8:22
hamstrung [1] - 12:2
hand [6] - 28:5, 71:19, 117:13, 152:6, 176:20, 184:17
handed [1] - 87:20
handle [5] - 15:25, 60:16, 61:5, 94:24, 179:22
handling [4] - 54:25, 120:21, 179:3, 181:9
hang [2] - 146:2
hard [2] - 21:22, 142:1
harder [1] - 110:23
harmful [5] - 7:15, 7:21, 7:23, 8:17, 8:21
HARRIS [4] - 1:4, 1:8, 2:3, 184:1
Harris [37] - 1:20, 5:5, 14:25, 15:13, 16:9, 16:18, 23:6, 24:22, 27:1, 28:2, 79:1, 95:9, 117:5, 170:6, 170:19, 170:21, 170:24, 173:1, 173:6, 173:19, 173:25, 174:21, 176:8, 177:3, 178:6, 178:8, 179:23, 180:16, 181:23, 182:1, 182:6, 182:12, 182:16, 182:17, 182:23, 184:4, 184:23
haul [1] - 84:11
hauled [1] - 57:25
hauling [2] - 54:17, 140:6
hazardous [8] - 7:20, 31:9, 31:17, 33:9, 36:12, 37:4, 111:8, 163:24
HC4024 [1] - 83:25
health [2] - 68:11, 97:19
Health [7] - 71:13, 73:16, 76:21, 97:11, 109:9, 111:14, 167:4
hear [7] - 12:3, 16:6, 82:9, 95:9, 111:11, 117:14, 151:4
heard [6] - 1:18, 15:11, 99:9, 111:8, 144:15, 174:5
hearing [9] - 57:13, 76:18, 77:20, 89:25, 132:24, 137:24, 148:9, 166:5, 173:13
hearsay [1] - 23:1
heating [1] - 144:13
heavy [1] - 124:25
held [4] - 1:19, 20:6, 135:17, 158:20
help [4] - 14:10, 33:9, 40:20, 178:10
helped [2] - 35:15, 139:4
helpful [3] - 10:7, 12:9, 121:23
helping [2] - 175:9, 177:4
Henderson [2] - 74:7, 168:4
hereby [2] - 172:22, 184:5
hereunder [1] - 172:6
hexachlorobenzene [4] - 36:15, 36:19, 38:7, 38:10
high [7] - 37:18, 68:24, 70:5, 71:6, 71:7, 162:13
higher [5] - 149:12, 154:16, 154:19, 154:23, 157:6
highlight [4] - 97:17, 119:11, 167:1, 167:21
highlighting [1] - 80:16
Highway [3] - 80:21, 85:7, 85:9
himself [1] - 58:19
HINTON [37] - 4:8, 13:24, 14:11, 14:14,

15:3, 17:7, 17:11, 17:15, 18:6, 18:12, 18:17, 19:7, 19:20, 21:10, 21:21, 22:1, 22:15, 22:25, 25:2, 78:24, 79:9, 79:13, 80:7, 81:25, 82:3, 82:5, 84:16, 85:14, 86:7, 86:12, 87:1, 87:3, 88:18, 90:6, 90:16, 96:5, 96:15
Hinton [5] - 82:10, 85:19, 86:6, 90:2, 90:9
hired [3] - 32:7, 182:5, 182:6
historic [4] - 128:25, 129:5, 129:9, 129:11
historical [10] - 40:12, 40:17, 41:2, 41:6, 108:23, 112:21, 120:2, 120:7, 128:22, 169:1
history [3] - 6:6, 29:4, 122:21
hit [1] - 126:21
hold [5] - 49:24, 100:21, 100:25, 101:16, 121:13
holding [1] - 67:7
home [1] - 183:9
Honor [69] - 7:12, 10:22, 13:12, 13:24, 14:11, 15:3, 15:6, 16:10, 17:7, 17:11, 18:23, 19:1, 19:7, 19:10, 20:4, 21:10, 21:25, 23:1, 23:2, 24:10, 25:2, 26:16, 28:11, 50:17, 57:10, 58:14, 59:11, 60:23, 62:25, 68:7, 76:15, 77:16, 78:24, 79:14, 80:8, 80:15, 80:22, 84:8, 84:17, 85:15, 87:4, 88:11, 88:18, 90:7, 90:16, 90:25, 91:11, 96:15, 96:22, 102:18, 102:24, 103:15, 122:5, 123:14, 131:11, 132:17, 133:4, 136:21, 137:5, 137:11, 137:18, 138:9, 141:3, 148:24, 152:20, 157:19, 170:12, 173:5, 183:5
Honorable [1] - 1:19
hope [2] - 10:25, 12:16
hopefully [1] - 16:3
horizon [1] - 40:1
horizontal [3] - 145:3, 145:4, 155:17
hour [1] - 41:24
hours [3] - 42:1, 42:3, 49:7
hours.. [1] - 132:2
HOUSTON [5] - 2:6, 2:12, 3:6, 3:16, 4:6
Houston [7] - 1:20, 41:12, 75:19, 141:24, 145:13, 154:7, 184:24
howell [1] - 31:23
humans [2] - 29:20, 29:22
hundred [5] - 40:4, 101:20, 147:4, 154:23, 157:6
hundreds [2] - 101:13, 158:24
hurricane [1] - 30:24
hydrogens [1] - 36:9
hydrologist [1] - 117:1
hydrophobic [7] - 36:6, 144:10, 144:12, 144:13, 144:16, 144:18, 155:11
hypothetical [1] - 54:6

I

I-10 [7] - 26:20, 43:9, 103:24, 142:10, 145:19, 156:5, 163:1
idea [4] - 46:15, 120:8, 165:10, 177:14
ideal [2] - 181:1, 181:15
identify [3] - 51:17, 173:21, 173:22
image [1] - 116:11
images [2] - 107:12, 108:4
immediately [3] - 126:13, 154:15, 154:22
impacts [1] - 30:25
impart [1] - 100:16
important [20] - 11:7, 73:14, 98:22, 107:21, 112:10, 114:15, 121:11, 121:19, 122:15, 122:19, 123:5, 134:15, 143:7, 143:21, 147:2, 160:18, 165:4, 165:10, 165:23, 167:11
impossible [2] - 101:14, 169:16
impoundment [66] - 12:16, 17:17, 17:22, 18:2, 18:9, 18:22, 19:9, 19:14, 19:21, 20:2, 20:8, 20:16, 20:17, 20:25, 21:12, 21:19, 23:17, 23:25, 24:1, 24:3, 24:5, 26:8, 27:2, 43:20, 56:6, 63:3, 70:10, 75:22, 78:23, 79:5, 79:10, 79:16, 79:18, 79:19, 79:24, 79:25, 80:2, 80:17, 80:18, 80:25, 81:14, 81:23, 82:1, 82:3, 82:12, 82:13, 83:7, 84:10, 85:12, 86:15, 86:18, 86:21, 87:5, 87:7, 87:11, 88:19, 88:25, 90:5, 90:13, 92:1, 93:8, 99:24, 113:15, 149:2, 150:1, 161:6
impoundments [107] - 19:18, 20:11, 26:11, 42:13, 42:17, 43:8, 43:12, 45:11, 45:18, 46:1, 46:4, 47:8, 50:5, 55:7, 55:11, 62:7, 62:8, 65:11, 65:17, 65:20, 68:1, 69:10, 70:8, 71:9, 72:4, 74:5, 74:13, 74:18, 75:2, 75:12, 75:21, 75:25, 76:9, 76:11, 78:17, 78:22, 80:12, 81:17, 82:17, 83:2, 83:5, 83:10, 83:12, 84:2, 84:3, 84:15, 85:6, 86:3, 87:25, 88:13, 88:15, 88:17, 88:24, 89:15, 92:18, 93:12, 93:14, 99:14, 99:20, 99:22, 105:12, 110:21, 111:6, 112:22, 113:9, 114:7, 114:21, 119:11, 124:14, 125:23, 128:17, 128:25, 129:5, 129:18, 130:2, 130:4, 132:7, 135:4, 135:6, 135:20, 143:18, 149:13, 152:23, 154:1, 154:10, 154:11, 154:22, 155:19, 155:23, 156:1, 156:7, 156:14, 157:7, 158:8, 158:14, 169:18, 169:22, 169:25, 171:8, 173:3, 173:25, 174:14, 174:18, 175:10, 177:12, 177:17, 181:16
impractical [1] - 136:13
imprecise [1] - 8:8
impression [3] - 9:21, 13:21, 14:22
IN [1] - 1:4
in-between [1] - 10:14
INC [4] - 1:10, 1:11, 3:4, 3:4
included [4] - 84:9, 100:5, 126:20, 184:9
including [4] - 15:12, 48:21, 49:12, 49:18
incomplete [1] - 129:14
inconsistent [2] - 113:3, 129:1
incorporated [1] - 17:23
incorrect [1] - 15:22
independent [4] - 172:5, 172:7, 172:15, 178:5
independently [1] - 98:25
indicate [2] - 139:15, 179:17
indicated [4] - 17:8, 109:20, 140:13, 178:23
indicating [7] - 43:18, 44:15, 157:6, 158:9, 160:7, 160:22, 164:4
indicating) [38] - 30:15, 44:1, 45:3, 45:7, 51:25, 64:22, 64:24, 65:2, 70:16, 74:3, 103:23, 104:2, 104:11, 106:10, 108:2, 112:6, 112:8, 116:13, 117:14, 118:5, 118:10, 119:15, 119:17, 127:9, 127:13, 139:17, 142:20, 145:2, 145:14, 146:8, 146:12, 146:16, 146:18, 146:23, 149:8, 155:20, 160:14, 160:19
indication [2] - 42:16, 160:5
indispensable [1] - 1:6
Industrial [1] - 72:20
INDUSTRIAL [2] - 1:9, 4:4
industrial [8] - 34:12, 36:22, 36:23, 47:12, 69:12, 69:13, 69:16
industry [1] - 35:7
inert [1] - 56:24
information [57] - 20:7, 40:25, 41:6, 42:15, 42:24, 45:24, 46:2, 50:11, 50:16, 51:22, 56:5, 56:7, 64:4, 64:16, 72:3, 72:6, 72:9, 72:13, 74:24, 76:22, 83:11, 97:14, 98:7, 98:13, 98:22, 103:10, 104:24, 104:25, 108:22, 119:7, 119:17, 120:7, 120:23, 121:9, 128:15, 129:17, 132:1, 133:19, 133:23, 133:25, 135:19, 137:1, 138:13, 138:20, 139:3, 139:6, 139:22, 140:11, 142:14, 142:25, 143:8, 148:16, 160:3, 165:17, 165:19, 165:21
inside [8] - 44:19, 71:9, 118:4, 118:6, 158:21, 161:14, 161:22, 161:24
inspected [1] - 179:12
instability [1] - 150:6
instead [4] - 37:6, 37:7, 38:2, 38:11
institute [2] - 30:13, 30:17
instruction [8] - 93:2, 93:18, 94:8, 95:17, 95:24, 96:2, 96:4, 96:14
instrument [2] - 79:15, 80:11
integrity [1] - 111:4
intend [1] - 123:7
intending [1] - 58:19
intends [1] - 87:16

intention [2] - 26:6, 26:9
interchangeably [1] - 44:10
interest [3] - 31:16, 32:17, 40:23
interesting [2] - 32:20, 112:20
interests [1] - 123:9
interject [1] - 5:15
interlinked [1] - 66:6
internal [3] - 44:18, 55:23, 56:2
International [4] - 166:10, 166:12, 171:3, 173:22
INTERNATIONAL [2] - 1:9, 3:14
interpreting [1] - 107:8
interrupted [1] - 117:15
Interstate [1] - 18:20
introducing [1] - 158:17
introduction [1] - 5:22
inverted [2] - 43:20, 44:22
investigated [1] - 55:2
investigation [18] - 6:2, 6:5, 68:11, 71:13, 71:21, 72:17, 73:16, 88:8, 91:1, 91:2, 91:5, 91:10, 97:12, 97:19, 98:1, 127:2, 128:25, 160:1
Investigation [1] - 141:15
investigations [1] - 119:21
invited [2] - 5:10, 35:7
involve [1] - 35:1
involved [14] - 22:19, 34:5, 35:14, 35:25, 40:1, 40:16, 41:11, 54:5, 173:24, 174:2, 174:3, 175:5, 175:9, 177:4
involvement [3] - 166:13, 180:3, 182:15
involving [1] - 129:5
IP [3] - 13:18, 68:6, 70:18
irrelevant [2] - 18:8, 129:13
Islands [1] - 30:19
issue [39] - 5:5, 7:4, 7:8, 9:18, 9:25, 10:4, 10:17, 11:21, 11:22, 12:18, 12:22, 16:3, 17:17, 18:3, 21:12, 22:18, 23:4, 23:12, 27:5, 27:13, 32:19, 38:12, 57:17, 61:5, 79:11, 81:1, 86:8, 86:19, 87:7, 91:19, 93:4, 93:11, 94:5, 94:20, 95:14, 95:21, 96:12, 99:10, 112:20
issues [10] - 7:9, 11:1, 13:7, 30:21, 86:16, 98:24, 100:3, 117:4, 117:5, 117:7
items [1] - 79:2
itself [7] - 38:2, 62:8, 62:9, 75:22, 112:15, 149:2, 174:1

J

Jacinto [32] - 6:5, 21:3, 26:20, 43:9, 85:3, 85:13, 85:15, 86:4, 99:20, 100:20, 102:16, 105:14, 114:23, 114:24, 115:7, 115:11, 115:12, 115:14, 117:23, 117:25, 118:18, 129:21, 131:4, 136:14, 140:5, 141:22, 145:13, 159:10, 160:19, 169:17, 170:2, 179:11
January [1] - 135:16
Jell [3] - 66:4, 66:5
Jell-O [3] - 66:4, 66:5
Jen [1] - 24:11
Jersey [1] - 34:9
jet [2] - 75:13, 125:8
jetted [1] - 124:11
jetting [1] - 124:14
job [1] - 95:11
John [3] - 25:5, 28:3, 33:1
JOHN [2] - 2:9, 28:13
Johns [1] - 148:19
journal [1] - 38:23
journals [2] - 39:9, 39:13
JPMORGAN [1] - 2:5
judge [2] - 25:19, 95:11
Judge [1] - 1:19
JUDICIAL [1] - 1:11
July [2] - 88:10, 105:11
jump [7] - 95:4, 95:5, 150:21, 150:24, 151:5, 151:14, 152:3
June [3] - 73:1, 105:10, 128:8
JURY [1] - 177:23
Jury [6] - 57:18, 63:19, 78:3, 96:25, 148:14, 152:17
jury [45] - 5:11, 7:15, 7:19, 7:22, 8:19, 8:23, 9:21, 24:19, 25:22, 26:25, 27:7, 27:10, 27:16, 27:17, 27:18, 57:13, 60:21, 61:15, 62:24, 76:18, 77:20, 78:9, 78:12, 81:18, 81:19, 82:16, 84:1, 89:25, 96:24, 132:24, 137:24, 141:10, 148:9, 150:11, 166:5, 166:20, 167:3, 167:10, 167:14, 169:6, 169:22, 173:13, 174:5, 175:14
jury) [1] - 61:11

K

KAIM [1] - 3:9
Katrina [1] - 30:24
keep [10] - 37:20, 43:21, 90:24, 111:19, 112:17, 152:16, 160:25, 166:20, 172:20, 180:8
keeping [1] - 111:4
kept [4] - 8:21, 8:22, 10:1, 45:19
key [5] - 72:24, 104:5, 112:15, 142:1, 160:3
Kidd [3] - 184:3, 184:21, 184:21
kids [2] - 29:11, 29:12
kill [1] - 69:6
Kimberly [3] - 184:3, 184:21, 184:21
kind [45] - 13:6, 29:4, 33:14, 34:10, 34:11, 36:3, 39:7, 39:13, 41:16, 43:19, 43:20, 44:4, 44:21, 47:16, 49:16, 51:18, 52:15, 52:20, 53:25, 67:13, 67:15, 68:13, 74:4, 75:6, 75:23, 103:10, 106:2, 107:7, 109:4, 109:5, 113:13, 116:16, 117:4, 117:5, 123:12, 127:11, 127:22, 130:5, 131:6, 142:1, 155:5, 156:7, 158:9, 158:11, 163:17
kinds [4] - 83:20, 128:4, 163:23, 163:25
knowledge [4] - 22:25, 50:8, 53:6, 91:15
known [2] - 10:2, 68:19
kraft [3] - 47:17, 47:18, 47:19

L

lab [10] - 33:12, 35:18, 36:11, 36:14, 38:11, 38:20, 38:22, 64:14, 64:23, 71:5
ladies [7] - 27:22, 57:15, 77:24, 97:2, 132:20, 148:11, 183:8
lady [1] - 32:2
laid [3] - 25:21, 58:15, 83:2
Lake [2] - 141:23, 154:6
lake [1] - 159:6
land [12] - 35:5, 35:6, 54:17, 55:1, 56:18, 103:13, 106:19, 107:18, 126:7, 138:18, 140:8, 159:8
landowner [1] - 80:2
large [3] - 34:14, 49:23, 153:17
larger [2] - 50:3, 147:5
largest [1] - 34:16
laser [6] - 30:10, 30:14, 97:22, 139:15, 142:8, 160:13
last [23] - 9:16, 40:5, 66:16, 76:25, 77:1, 77:2, 77:4, 77:6, 80:22, 82:25, 84:23, 87:18, 98:4, 109:24, 110:18, 123:6, 123:16, 123:17, 130:8, 138:21, 149:3, 163:2, 172:18
late [1] - 108:20
law [2] - 14:8, 14:9
laws [1] - 172:23
lawsuit [3] - 17:17, 23:4, 81:1
lawyers [3] - 182:7, 182:13, 182:14
lay [10] - 22:20, 22:22, 23:18, 23:22, 24:5, 25:14, 25:16, 25:23, 27:6, 82:8
layer [9] - 111:4, 149:2, 149:5, 149:18, 161:13, 161:15, 162:14, 165:8, 165:9
layers [2] - 66:23, 128:4
laying [1] - 27:15
lead [1] - 151:6
leading [1] - 151:1
leaked [2] - 35:8, 36:24
learn [2] - 175:18, 182:22
learned [1] - 182:13
least [2] - 112:16, 128:2
leave [7] - 32:12, 40:22, 50:2, 99:13, 100:1, 102:7, 181:11
leaving [4] - 52:10, 85:5, 104:7, 160:5
leeway [2] - 150:21, 151:1
left [21] - 40:20, 43:22, 45:23, 48:20, 49:19, 57:19, 79:3, 80:9, 94:5, 99:7, 106:17, 106:21, 107:6, 108:17, 114:10, 125:16, 140:22, 145:11, 151:24, 158:7, 163:16
legal [6] - 115:1, 115:4, 118:22, 118:23, 170:13, 170:14
legend [1] - 157:15
length [1] - 127:13
letter [14] - 5:11, 5:13, 6:19, 18:3, 18:11, 18:19, 18:21, 51:12, 65:6, 133:13, 169:6, 180:10, 180:21, 181:19
letters [4] - 128:7, 128:8, 128:16, 160:16
letting [1] - 7:18
levee [10] - 43:25, 44:8, 99:22, 108:1, 127:11, 133:19, 134:3, 134:7,

134:20, 135:8
levees [21] - 35:6, 44:12, 98:15, 98:17, 98:19, 107:7, 113:4, 119:6, 119:8, 119:10, 119:21, 125:23, 126:12, 126:14, 126:18, 132:10, 132:14, 133:24, 133:25, 134:19, 140:22
level [8] - 69:24, 104:15, 104:18, 105:2, 105:4, 106:15, 106:25, 162:12
levels [2] - 149:20, 161:6
LEWIS [1] - 3:15
licenses [1] - 172:20
life [1] - 37:17
light [4] - 81:3, 81:8, 101:1, 108:5
limestone [1] - 56:24
limine [1] - 7:11
limit [1] - 37:22
line [14] - 25:6, 27:17, 30:12, 31:7, 31:20, 64:24, 65:2, 66:16, 91:18, 143:1, 143:2, 146:9, 154:10, 157:13
lined [2] - 63:18, 146:5
lines [9] - 12:24, 30:11, 63:2, 104:14, 142:2, 142:18, 142:19, 143:5, 176:18
link [2] - 24:3, 26:7
liquid [1] - 181:10
liquor [7] - 7:14, 24:14, 47:23, 60:24, 84:20, 88:8
list [2] - 5:22, 29:3
listed [1] - 164:1
lists [1] - 54:7
liter [4] - 147:11, 147:12, 148:3, 164:21
literature [1] - 41:16
live [3] - 29:7, 29:8, 29:13
living [1] - 28:18
LLP [5] - 2:4, 3:5, 3:15, 3:21, 4:5
load [1] - 52:14
loaded [1] - 123:20
loading [3] - 26:21, 73:10, 135:20
local [1] - 172:24
located [8] - 76:13, 115:6, 132:7, 142:11, 143:12, 169:25, 171:1, 177:18
location [10] - 116:14, 120:22, 122:25, 127:11, 136:14, 158:4, 160:21, 161:16, 180:25, 181:15
locations [2] - 35:15, 151:25
log [2] - 128:1, 128:2
look [44] - 6:16, 7:1, 7:3, 9:9, 14:18, 39:11, 40:12, 40:24, 50:23, 64:3, 64:11, 65:1, 66:16, 72:16, 84:23, 85:11, 85:20, 90:6, 91:6, 98:3, 107:10, 113:11, 113:18, 116:9, 120:11, 121:2, 123:19, 127:24, 131:11, 135:9, 136:5, 143:20, 150:18, 157:17, 157:21, 162:19, 163:3, 163:7, 167:17, 168:14, 172:1, 180:6, 180:7
looked [18] - 9:1, 35:25, 46:2, 60:1, 67:25, 71:20, 100:13, 108:6, 108:10, 116:18, 124:25, 129:5, 130:7, 133:6, 136:7, 138:5, 141:7, 180:7
looking [41] - 11:20, 13:14, 13:25, 63:23, 65:6, 65:21, 66:17, 67:12, 68:9, 74:1, 74:2, 89:8, 90:9, 100:25, 103:20, 105:24, 106:7, 107:2, 110:24, 112:5, 116:5, 128:7, 134:5, 138:19, 138:21, 139:12, 141:6, 141:10, 141:21, 141:22, 142:5, 142:12, 144:1, 145:24, 155:1, 158:5, 158:6, 158:7, 161:5, 163:17, 165:18
looks [4] - 106:2, 106:21, 106:24, 118:2
LOUISIANA [3] - 3:6, 3:15, 4:6
Louisiana [9] - 28:20, 29:8, 30:12, 30:16, 31:1, 31:20, 34:1, 35:2, 39:22
low [5] - 35:6, 37:23, 153:8, 154:8, 165:9
lower [3] - 70:21, 157:3, 164:24
lowered) [1] - 19:11
LSU [9] - 30:4, 30:7, 32:3, 32:21, 32:23, 33:4, 33:22, 34:18, 42:7
lump [1] - 155:5
lunch [1] - 78:2

M

ma'am [2] - 79:12, 87:2
machine [1] - 1:21
machines [1] - 127:19
magazine [1] - 38:23
magnitude [7] - 149:12, 150:4, 154:16, 154:19, 154:21, 157:5
mail [1] - 5:7
maintained [5] - 112:16, 112:17, 129:24, 130:11, 140:18
maintaining [2] - 173:3, 173:21
maintenance [3] - 112:25, 113:2, 140:14
Maintenance [1] - 72:20
MAINTENANCE [2] - 1:10, 4:4
majority [1] - 85:1
man [1] - 35:5
MANAGEMENT [4] - 1:10, 1:11, 3:4, 3:4
Management [5] - 5:10, 7:14, 8:2, 9:3, 10:2
manner [1] - 181:10
map [8] - 141:22, 145:9, 145:10, 153:23, 153:25, 155:24, 156:1, 156:9
March [10] - 25:8, 105:19, 118:12, 118:20, 122:13, 123:3, 153:19, 177:10, 178:15, 178:18
marine [1] - 30:3
MARK [1] - 3:9
marked [2] - 155:25, 158:8
marker [15] - 142:22, 143:12, 145:12, 145:16, 145:17, 145:18, 145:19, 145:21, 145:22, 146:6, 146:15, 146:17, 156:1, 156:6, 156:7
markers [3] - 142:3, 143:6, 156:8
marks [1] - 105:5
married [1] - 29:9
marsh [1] - 39:21
marshall [1] - 5:8
marshes [2] - 39:25, 40:2
Maryland [1] - 35:12
mass [2] - 37:15, 106:19
Massachusetts [1] - 35:17
master's [2] - 30:3, 35:22
material [78] - 41:7, 45:20, 46:1, 49:21, 51:14, 52:7, 52:20, 53:20, 53:23, 56:8, 56:11, 56:12, 56:23, 56:24, 57:3, 57:25, 59:2, 67:15, 68:15, 69:3, 73:12, 74:4, 74:9, 74:12, 74:17, 74:22, 75:14, 86:23, 108:20, 108:21, 109:1, 109:5, 109:18, 109:19, 109:21, 109:22, 112:19, 113:14, 113:25, 114:1, 121:1, 121:3, 121:16, 122:17, 124:11, 125:1, 125:7, 125:10, 125:25, 126:1, 126:8, 126:18, 126:20, 127:24, 129:25, 130:18, 130:19, 130:20, 130:23, 130:24, 130:25, 131:6, 133:15, 136:4, 138:14, 139:20, 139:24, 140:11, 153:16, 159:2, 159:3, 165:8, 165:9, 167:18, 168:3, 168:7, 168:16, 168:17
materials [10] - 49:12, 68:20, 86:14, 90:21, 120:1, 127:22, 128:5, 139:9, 159:7, 179:10
matter [12] - 5:14, 55:9, 57:1, 62:12, 72:23, 89:7, 104:4, 107:22, 116:3, 120:13, 136:8, 157:25
matters [2] - 27:23, 132:19
matting [1] - 110:1
McGinnis [12] - 1:9, 25:12, 25:14, 72:19, 73:3, 76:7, 76:23, 79:25, 84:11, 87:9, 98:18, 109:25
MCGINNIS [1] - 4:4
mean [16] - 31:25, 37:13, 47:18, 59:4, 65:25, 88:11, 88:14, 104:15, 104:18, 105:2, 106:15, 106:25, 126:1, 130:24, 139:14, 154:19
meaning [2] - 45:15, 136:22
means [14] - 8:4, 32:1, 32:5, 37:14, 37:24, 57:6, 93:3, 124:12, 125:20, 130:25, 144:13, 154:20, 164:14, 172:8
meant [2] - 93:22, 137:8
measurable [1] - 149:4
measure [11] - 70:3, 144:21, 147:12, 147:13, 155:5, 155:12, 156:18, 156:22, 158:14, 162:15, 165:15
measured [4] - 69:22, 149:22, 155:7, 158:15
measurement [3] - 155:7, 158:1, 160:6
measurements [3] - 51:16, 149:7, 150:2
measures [2] - 68:22, 155:2
measuring [2] -

147:10, 147:24
mechanism [2] - 165:11, 165:13
mechanisms [9] - 40:21, 99:7, 99:18, 99:25, 152:25, 153:17, 153:21, 157:9, 165:24
meet [2] - 79:22, 166:11
meetings [1] - 182:18
MELANIE [1] - 4:8
members [1] - 138:16
memo [2] - 53:17, 125:14
memorandum [2] - 120:12, 133:9
memory [2] - 5:9, 135:3
memos [1] - 41:4
Memphis [1] - 30:3
mention [2] - 9:19, 9:20
mentioned [1] - 100:3
messed [1] - 64:19
met [2] - 29:19, 32:11
metal [1] - 127:18
metals [2] - 163:18, 163:19
method [7] - 34:19, 89:13, 179:2, 179:9, 179:17, 179:18
methods [6] - 31:18, 31:19, 51:14, 54:3, 54:7, 172:8
microns [1] - 101:14
mid [1] - 29:25
middle [4] - 43:19, 45:5, 119:12, 160:22
might [9] - 54:2, 67:3, 119:4, 124:10, 125:3, 130:8, 131:19, 132:17, 134:22
mile [21] - 142:3, 142:22, 143:6, 143:12, 144:24, 145:8, 145:12, 145:16, 145:17, 145:18, 145:19, 145:21, 145:22, 146:6, 146:15, 146:17, 155:18, 156:1, 156:6, 156:7, 156:8
mile-marker [14] - 142:22, 145:12, 145:16, 145:17, 145:18, 145:19, 145:21, 145:22, 146:6, 146:15, 146:17, 156:1, 156:6, 156:7
mile-markers [2] - 143:6, 156:8
miles [5] - 54:18, 54:23, 55:25, 142:22, 150:19
mill [11] - 8:18, 19:17, 47:17, 47:18, 49:9, 50:13, 54:25, 69:15, 108:24, 164:6, 171:7
million [1] - 49:1
mills [2] - 48:25, 70:4
MIMC [19] - 10:3, 13:14, 13:18, 17:19, 17:23, 18:3, 19:21, 21:6, 21:9, 21:10, 21:14, 21:15, 22:6, 22:12, 22:19, 23:17, 26:18, 83:25, 89:9
MIMC's [1] - 21:17
mind [4] - 46:20, 59:4, 134:11, 168:1
minus [1] - 125:20
minute [8] - 17:16, 61:13, 97:18, 104:21, 144:25, 146:22, 148:12
minutes [5] - 96:3, 138:3, 138:8, 139:23, 140:19
mirror [1] - 147:7
misleading [1] - 87:14
missed [1] - 6:15
missing [1] - 5:16
misspoke [1] - 163:2
mistaken [1] - 143:4
mistakenly [1] - 85:5
misuse [3] - 81:3, 81:6, 81:8
mix [5] - 52:15, 56:18, 75:5, 75:8, 75:14
mixed [4] - 46:25, 74:22, 74:23, 75:4
mixing [2] - 75:16
mixture [7] - 47:24, 52:21, 124:21, 124:24, 127:25, 128:3, 131:1
mobilize [1] - 153:5
modifications [1] - 47:20
moisture [14] - 52:6, 52:19, 62:10, 62:16, 63:11, 63:15, 64:2, 64:17, 65:4, 66:1, 66:20, 66:24, 67:13, 125:19
molecule [1] - 164:15
moment [4] - 19:23, 82:6, 84:18, 179:18
money [3] - 30:22, 31:4, 32:2
monitoring [1] - 160:20
month [2] - 122:13, 178:15
monthly [1] - 122:10
months [3] - 132:11, 132:15, 134:1
MORGAN [1] - 3:15
morning [4] - 7:6, 27:20, 39:18, 183:11
most [9] - 43:17, 44:15, 89:12, 104:13, 104:16, 105:15, 114:4, 128:5, 179:19
mostly [4] - 52:19, 66:2, 75:6, 109:2
motion [1] - 7:10
mouth [1] - 179:10
move [21] - 45:20, 47:2, 58:12, 64:20, 67:22, 76:3, 82:24, 83:18, 97:3, 111:22, 113:17, 122:25, 123:15, 124:20, 125:5, 129:16, 135:25, 153:5, 153:15, 172:17, 181:18
moved [10] - 37:1, 45:21, 49:25, 72:14, 73:8, 99:2, 99:6, 112:13, 151:24, 153:3
movement [2] - 117:9
moving [9] - 5:21, 60:15, 65:17, 65:19, 83:4, 86:14, 112:11, 120:21, 154:6
MR [255] - 2:7, 2:8, 2:9, 2:14, 2:21, 3:8, 3:8, 3:9, 3:9, 3:10, 3:11, 3:17, 3:18, 3:18, 3:19, 3:23, 5:5, 5:15, 5:20, 6:1, 6:14, 6:22, 6:25, 7:4, 7:8, 7:25, 8:10, 8:25, 9:7, 10:22, 11:9, 11:14, 12:13, 12:19, 12:20, 13:2, 13:5, 13:12, 13:13, 15:6, 15:11, 15:22, 16:10, 16:17, 17:1, 17:5, 17:10, 17:13, 17:14, 18:5, 18:10, 18:14, 18:23, 19:10, 19:16, 20:4, 20:19, 20:21, 21:5, 21:22, 21:24, 22:2, 22:5, 22:6, 22:10, 22:13, 22:16, 22:20, 22:24, 23:2, 23:8, 23:9, 23:18, 24:7, 24:9, 24:17, 24:22, 24:25, 25:4, 25:7, 25:8, 25:13, 25:19, 25:24, 26:9, 27:9, 28:2, 28:10, 28:16, 29:1, 43:3, 50:7, 50:24, 51:2, 51:3, 53:5, 55:16, 55:18, 55:21, 57:8, 58:3, 58:7, 58:11, 58:21, 59:10, 59:19, 60:4, 60:8, 60:14, 61:1, 61:4, 61:8, 62:22, 63:15, 63:22, 63:24, 64:5, 64:10, 68:5, 76:15, 77:3, 77:6, 77:22, 78:13, 78:21, 81:15, 81:21, 82:2, 82:4, 82:7, 82:15, 82:21, 82:25, 83:9, 84:5, 84:7, 84:20, 85:20, 85:23, 86:1, 86:24, 88:1, 88:5, 88:14, 88:16, 89:1, 89:3, 89:6, 89:11, 89:20, 90:25, 91:4, 91:8, 91:11, 91:13, 91:20, 92:14, 92:22, 92:24, 93:15, 93:20, 94:15, 94:19, 95:2, 96:1, 96:22, 97:5, 97:8, 102:18, 102:23, 103:2, 103:15, 104:22, 105:22, 108:13, 109:7, 110:17, 111:22, 113:6, 113:11, 113:17, 115:1, 115:16, 115:20, 116:8, 118:21, 118:25, 120:14, 121:5, 121:25, 122:5, 123:14, 127:5, 129:2, 129:13, 129:16, 131:9, 131:17, 132:17, 133:4, 134:11, 135:9, 136:5, 136:21, 136:24, 137:11, 137:18, 138:9, 138:11, 138:25, 141:3, 141:5, 141:12, 143:15, 143:24, 146:4, 148:5, 148:17, 148:23, 148:24, 149:9, 149:17, 150:3, 150:8, 150:9, 150:12, 150:17, 150:23, 151:7, 151:21, 152:6, 152:9, 152:13, 152:20, 156:3, 156:10, 157:19, 160:11, 160:15, 163:6, 165:25, 166:8, 167:1, 167:8, 169:4, 169:10, 170:12, 171:10, 172:17, 173:5, 173:17, 176:20, 177:21, 178:13, 183:5
MS [53] - 2:8, 3:10, 4:8, 4:8, 6:8, 7:12, 8:14, 9:16, 13:24, 14:11, 14:14, 15:3, 17:7, 17:11, 17:15, 18:6, 18:12, 18:17, 19:7, 19:20, 21:10, 21:21, 22:1, 22:15, 22:25, 25:2, 26:16, 50:17, 58:14, 60:22, 61:3, 62:25, 63:12, 77:16, 78:24, 79:9, 79:13, 80:7, 81:25, 82:3, 82:5, 84:16, 85:14, 86:7, 86:12, 87:1, 87:3, 88:18, 90:6, 90:16, 96:5, 96:15, 137:5
mud [9] - 67:2, 67:3, 67:14, 67:15, 67:16, 67:19, 126:2, 168:11, 168:13
Muir [6] - 20:12, 80:14, 84:6, 84:18, 85:18, 86:11
MUIR [19] - 2:9, 17:13, 18:23, 20:4, 61:1, 81:21, 82:2, 82:4, 84:7, 84:20, 85:20, 85:23, 86:1, 86:24, 88:14, 90:25, 91:4, 91:8, 150:3
multiple [3] - 45:24, 126:11, 149:21
municipal [1] - 68:25
must [2] - 55:2, 58:8
mustard [1] - 158:9

N

N.W [1] - 3:21
name [1] - 161:3
named [3] - 16:20, 32:1, 164:9
names [1] - 160:25
nanogram [2] - 147:17, 147:20
natural [2] - 100:13, 183:7
nature [1] - 136:1
near [5] - 41:13, 86:4, 93:14, 160:20, 170:1
nearly [2] - 80:13, 98:15
necessary [3] - 1:6, 16:2, 16:8
ned [1] - 131:24
need [34] - 5:19, 10:22, 12:11, 14:18, 18:17, 18:18, 25:17, 28:8, 50:22, 60:17, 65:15, 76:7, 78:11, 80:24, 88:22, 92:1, 92:17, 93:3, 117:21, 122:3, 123:2, 132:8, 134:1, 136:2, 138:12, 141:1, 142:6, 143:20, 143:24, 148:5, 148:11, 158:18, 162:19, 163:7
needed [8] - 10:18, 20:10, 68:22, 75:5, 76:23, 77:9, 91:15, 91:21
needs [5] - 16:25, 24:14, 59:23, 65:15, 98:17
NELSON [1] - 3:23
neutral [1] - 109:21
never [5] - 69:21, 91:21, 102:8, 130:10, 183:2
New [2] - 34:9, 34:10
new [8] - 31:18, 34:15, 34:19, 85:3, 86:1, 86:2, 158:18
Newark [1] - 34:9
news [1] - 166:19
next [21] - 31:7, 31:20, 52:16, 52:17, 54:15, 54:21, 65:8, 79:21, 80:11, 80:15, 107:1, 108:14, 113:6, 132:2, 138:21, 145:15, 145:18, 145:21, 163:21, 168:14, 181:4
next-to-the-bottom [1] - 80:11
next-to-the-last-page [1] - 138:21
nice [1] - 166:11
nine [1] - 10:16
nitrogen [1] - 56:17
NO [1] - 1:2
nominal [2] - 15:21, 140:10
non [2] - 109:21, 111:15
non-toxic [2] - 109:21, 111:15
nonissue [1] - 94:9
normally [1] - 33:16
north [3] - 26:20, 43:9, 163:1
northern [29] - 17:22, 18:2, 20:8, 20:17, 23:17, 23:24, 24:5, 25:11, 26:7, 27:2, 79:24, 81:17, 82:17, 84:2, 86:3, 86:15, 86:18, 86:21, 87:10, 87:25, 88:14, 88:16, 88:24, 89:15, 90:5, 90:13, 93:7, 113:15, 149:13
note [3] - 70:2, 80:5, 154:8
notes [4] - 11:20, 51:3, 94:18, 178:19
nothing [9] - 6:19, 16:14, 17:12, 17:16, 17:22, 18:3, 18:7, 60:1, 86:17
notice [3] - 5:21, 9:3, 39:17
notices [1] - 39:19
notified [1] - 131:24
number [5] - 65:23, 68:24, 70:10, 86:3, 134:6
Number [1] - 135:10
numbered [3] - 1:18, 104:13, 184:10
numbering [1] - 135:22
numbers [8] - 65:12, 65:24, 67:21, 70:5, 71:7, 160:16, 164:18, 164:24

O

o'clock [1] - 116:13
oath [1] - 149:21
object [6] - 33:5, 95:4, 95:6, 148:5, 170:12, 173:6
objecting [5] - 18:7, 25:25, 59:6, 93:25, 94:19
objection [29] - 20:25, 50:7, 50:17, 53:5, 55:16, 57:8, 57:9, 57:21, 57:22, 58:2, 58:3, 58:14, 59:1, 59:11, 59:25, 60:2, 60:5, 60:19, 62:20, 64:5, 77:16, 93:20, 118:22, 123:14, 129:13, 136:21, 137:5, 137:18, 152:13
objections [2] - 7:2, 94:24
observations [1] - 174:24
obviously [7] - 6:25, 10:8, 12:10, 39:23, 90:2, 93:25, 118:5
occasions [1] - 129:11
occurred [3] - 30:25, 91:18, 184:11
OCTOBER [2] - 1:15, 5:1
October [2] - 1:18, 184:18
odd [1] - 90:17
OF [11] - 1:1, 1:4, 1:4, 1:11, 2:11, 2:17, 2:18, 3:4, 184:1, 184:1
off-site [1] - 122:18
offer [5] - 12:13, 59:21, 59:22, 96:7, 184:15
offered [4] - 96:8, 96:11, 169:22, 184:16
offering [2] - 20:3, 152:2
OFFICE [2] - 2:11, 2:18
office [2] - 33:12, 131:25
Official [2] - 184:3, 184:22
officials [2] - 89:11, 109:20
oiled [1] - 40:2
old [7] - 40:13, 80:21, 86:8, 86:10, 110:9, 110:12
older [1] - 90:23
Ole [17] - 21:8, 22:11, 22:18, 23:16, 73:2, 120:19, 121:15, 122:22, 171:14, 172:11, 172:14, 177:25, 178:5, 179:5, 179:22, 180:2
Olympic [7] - 46:15, 46:16, 46:17, 46:22, 49:2, 49:3, 121:14
Olympic-sized [1] - 121:14
ON [1] - 1:5
on-site [2] - 123:8, 125:25
once [6] - 11:21, 25:17, 27:17, 53:20, 80:9, 111:2
one [88] - 5:16, 7:8, 7:12, 10:6, 13:13, 14:19, 24:13, 30:7, 30:18, 30:19, 31:14, 33:15, 33:16, 34:8, 34:16, 38:24, 39:16, 39:18, 43:17, 43:19, 43:23, 43:24, 44:14, 44:15, 44:17, 44:18, 44:20, 44:21, 44:22, 44:23, 45:1, 45:3, 45:15, 54:8, 56:23, 60:23, 69:25, 70:7, 70:16, 72:1, 73:10, 74:24, 75:4, 76:2, 91:1, 92:7, 92:18, 92:25, 93:8, 94:8, 95:19, 98:14, 98:24, 101:13, 104:19, 116:5, 118:8, 118:9, 127:1, 127:3, 127:9, 134:6, 141:18, 141:21, 142:20, 144:3, 144:4, 145:3, 147:18, 147:22, 148:18, 150:12, 154:14, 154:20, 161:8, 164:2, 164:4, 164:12, 165:12, 168:2, 170:4, 171:17, 175:20, 176:8, 180:7
ones [2] - 39:15, 85:2
ongoing [3] - 78:17, 112:25, 142:16
open [4] - 11:2, 157:14, 157:16, 184:11
opened [2] - 7:13, 94:3
opening [14] - 5:24, 7:9, 9:11, 13:23, 14:23, 16:4, 91:21, 92:10, 92:17, 92:23, 93:1, 94:1, 94:16, 95:4
opens [5] - 9:15, 13:25, 14:6, 14:12, 116:16
operate [1] - 17:19
operated [1] - 42:12
operating [2] - 135:15, 157:9
operation [9] - 22:7, 23:4, 24:14, 72:25, 73:1, 73:4, 135:17, 136:2, 181:9
operations [6] - 17:24, 21:14, 21:18, 26:22, 78:17, 90:21
opine [1] - 99:7
opinion [54] - 50:12, 57:5, 74:16, 74:20, 99:10, 99:12, 99:13, 99:17, 102:17, 105:12, 105:15, 112:4, 112:24, 115:2, 115:4, 118:13, 118:18, 122:20, 125:22, 126:4, 129:19, 132:8, 134:24, 136:19, 137:2, 137:13, 137:17, 137:19, 139:4, 139:7, 139:24, 140:17, 140:21, 148:25, 150:16, 150:25, 151:5, 151:6, 151:9, 151:11, 151:12, 151:14, 151:15, 151:17, 151:20, 152:3, 152:12, 152:22, 154:3, 165:20, 171:18, 179:13
opinions [42] - 12:10, 12:11, 21:1, 42:10, 56:5, 69:20, 72:7, 72:10, 72:23, 73:6, 73:17, 73:23, 97:15, 98:8, 98:23, 104:4, 105:1, 107:22, 116:3, 116:18, 120:24, 121:9, 122:16, 133:8, 133:18, 134:16, 136:8, 138:15, 140:12, 143:21, 148:22, 149:22, 153:25, 157:22, 157:25, 162:10, 162:20, 164:3,

165:3, 165:4, 165:21, 167:11
opportunity [3] - 129:9, 175:17, 175:23
opposed [2] - 83:6, 88:24
opposing [1] - 9:11
options [1] - 53:23
order [4] - 149:12, 150:3, 150:4, 154:20
orders [4] - 154:16, 154:19, 154:21, 157:4
organic [6] - 36:8, 57:2, 68:23, 69:3, 69:17, 163:23
organize [1] - 31:5
organized [1] - 120:12
orient [4] - 30:14, 53:25, 97:18, 163:13
orientation [1] - 155:19
oriented [1] - 142:4
original [6] - 106:19, 134:3, 134:21, 142:11, 160:23
ourselves [2] - 47:10, 53:25
outline [9] - 106:12, 107:5, 108:16, 113:22, 118:7, 130:6, 142:10, 158:6
outlining [2] - 43:24, 108:17
outside [22] - 25:21, 27:7, 33:20, 34:10, 43:21, 44:22, 57:13, 60:20, 61:10, 61:14, 76:17, 77:19, 89:25, 119:13, 132:24, 134:19, 137:23, 148:8, 166:5, 173:13, 182:7, 182:13
overarching [1] - 9:17
overflight [1] - 43:6
overlaid [2] - 106:3, 106:12
overreaching [2] - 15:14, 16:18
overtaking [1] - 130:9
OWENS [1] - 2:14
Owens [1] - 182:18
own [5] - 31:5, 64:14, 64:23, 170:24, 171:4
owned [2] - 35:5, 140:4
ownership [1] - 103:13
oxygen [9] - 68:21, 68:22, 69:4, 69:5, 69:21, 69:22, 71:6, 71:7, 71:8

P

P-i-e-z-o-m-e-t-e-r-s [1] - 162:3
P.O [1] - 2:19
page [66] - 5:16, 51:23, 52:25, 56:13, 60:25, 63:24, 64:20, 68:6, 72:12, 73:24, 73:25, 76:12, 76:25, 77:1, 77:2, 79:14, 79:17, 80:8, 80:11, 80:15, 80:22, 81:21, 82:17, 82:20, 83:1, 83:4, 83:15, 84:23, 85:8, 85:9, 85:10, 85:11, 85:23, 87:18, 89:9, 89:15, 89:16, 97:6, 102:10, 103:21, 103:24, 104:23, 105:13, 108:14, 109:8, 109:11, 121:4, 122:1, 138:21, 140:1, 141:18, 141:21, 145:23, 156:4, 162:18, 162:22, 162:24, 163:2, 163:11, 163:21, 163:22, 167:2, 167:9, 167:12, 167:15, 172:18
Page [17] - 8:14, 18:25, 24:9, 24:12, 26:17, 61:23, 62:4, 70:18, 85:1, 85:4, 85:22, 88:23, 90:3, 90:9, 98:9, 105:22, 176:18
pages [5] - 72:2, 81:16, 81:19, 82:15, 88:11
paid [4] - 41:20, 41:22, 41:23, 41:24
palpable [1] - 75:5
PAPER [2] - 1:9, 3:14
paper [23] - 8:18, 41:17, 47:17, 47:18, 48:5, 48:8, 48:16, 48:17, 48:18, 48:25, 49:9, 50:13, 50:18, 58:16, 67:19, 69:15, 70:4, 89:18, 108:23, 110:20, 156:20, 156:21, 164:6
Paper [6] - 72:18, 166:10, 166:13, 171:3, 171:14, 173:22
Paper's [1] - 166:12
paper-making [1] - 58:16
paragraph [44] - 24:12, 53:24, 54:15, 55:21, 66:17, 72:15, 72:22, 73:15, 74:1, 80:12, 89:3, 89:9, 90:10, 98:22, 109:10, 109:11, 109:15, 121:2, 121:6, 121:8, 122:14, 131:18, 133:12, 134:8, 134:13, 134:16, 135:10, 135:21, 135:25, 138:19, 139:1, 139:2, 139:3, 139:13, 139:14, 149:3, 167:12, 167:15, 167:18, 167:22, 169:11, 169:13, 172:1, 172:4
paragraphs [8] - 77:4, 77:7, 83:23, 83:25, 98:11, 98:13, 138:22, 139:25
pardon [1] - 62:7
Pardue [32] - 8:7, 12:25, 22:24, 25:5, 26:17, 28:3, 28:4, 28:18, 33:2, 60:19, 61:9, 61:17, 74:20, 82:20, 88:22, 96:6, 96:24, 97:9, 103:16, 109:17, 131:19, 137:1, 140:21, 141:13, 152:14, 165:22, 165:25, 166:9, 168:11, 173:2, 173:18, 176:20
PARDUE [1] - 28:13
Pardue's [3] - 8:4, 63:9, 95:6
parks [1] - 6:2
Parks [1] - 6:18
part [32] - 6:15, 19:19, 20:9, 24:2, 26:4, 26:11, 31:7, 40:5, 47:1, 51:15, 56:15, 57:2, 71:12, 71:22, 71:24, 72:1, 75:4, 82:12, 84:10, 85:5, 90:23, 105:25, 123:16, 123:17, 141:16, 165:10, 167:10, 167:22, 168:22, 170:10, 181:4
partially [1] - 80:10
participate [1] - 39:12
participating [1] - 13:16
particle [4] - 100:12, 100:14, 101:23, 101:25
particles [20] - 49:18, 100:1, 100:6, 100:18, 101:2, 101:3, 112:13, 114:13, 114:15, 125:5, 144:4, 153:3, 153:5, 153:13, 153:14, 155:4, 156:18, 156:21, 156:23
particular [7] - 16:13, 50:20, 53:13, 55:9, 141:18, 164:8, 164:11
particularly [3] - 151:19, 169:14, 181:5
particulate [1] - 165:24
parties [6] - 16:21, 41:11, 79:8, 130:22, 175:17, 184:9
parties' [1] - 94:25
partnered [1] - 122:22
partnership [1] - 123:12
parts [2] - 5:19, 75:3
party [7] - 1:7, 15:21, 16:2, 16:8, 29:19, 94:12, 173:24
Pasadena [7] - 42:18, 42:20, 42:23, 50:13, 58:23, 62:6, 171:7
pass [1] - 156:20
Passaic [2] - 34:9, 34:24
passed [1] - 114:18
passing [1] - 114:9
past [2] - 41:9, 145:22
patience [2] - 27:22, 97:2
PAULA [1] - 4:8
pay [2] - 41:24, 116:13
paying [2] - 45:20, 182:9
PCBs [1] - 35:24
peanut [2] - 128:13, 128:14
peer [4] - 38:19, 39:2, 39:7, 39:8
peer-review [1] - 39:7
peer-reviewed [1] - 38:19
pen [1] - 97:22
penalties [1] - 16:19
penalty [6] - 5:12, 11:8, 11:10, 11:13, 12:8, 99:15
penetrate [2] - 168:18, 168:19
people [18] - 6:9, 15:20, 17:2, 39:11, 40:14, 51:12, 53:1, 53:2, 80:17, 92:2, 92:11, 93:17, 93:25, 126:13, 144:9, 144:15, 159:21, 183:2
per [4] - 147:11, 147:12, 148:3, 164:21
percent [28] - 52:6, 52:7, 52:18, 56:25, 65:7, 65:12, 65:13, 65:25, 66:1, 66:11, 66:12, 66:21, 66:25, 67:3, 67:7, 123:21, 123:22, 124:2, 124:3, 124:4, 124:7, 125:9, 125:19, 125:21, 168:12
percentage [2] - 75:1, 123:25
perforated [1] - 161:19
performance [1] - 172:21
performed [1] - 129:22
performing [1] - 172:5
perhaps [2] - 7:6, 174:3
period [28] - 10:15, 11:8, 11:10, 11:13, 12:8, 22:8, 23:3, 23:15, 32:7, 32:10, 40:22, 62:2, 62:13, 73:5, 98:25, 99:15, 99:18, 113:13, 113:24, 113:25, 114:11, 117:20, 118:11, 126:10, 126:16, 153:18, 158:3
periods [1] - 106:4
permanently [2] - 54:3, 105:8
permission [9] -

32:18, 76:7, 76:23, 77:9, 80:24, 83:1, 83:11, 92:3, 94:21
permit [15] - 77:11, 80:1, 84:25, 86:15, 86:17, 86:21, 87:6, 87:10, 87:24, 91:15, 91:21, 92:1, 92:17, 92:20, 95:13
permits [1] - 172:20
permitting [3] - 90:19, 92:13, 96:7
personal [3] - 22:25, 50:7, 53:5
personally [1] - 33:3
pertaining [1] - 172:24
pertinent [2] - 98:12, 98:21
Peterson [17] - 21:8, 22:11, 22:18, 23:16, 73:2, 120:20, 121:16, 122:22, 171:14, 172:11, 172:14, 178:1, 178:5, 179:5, 179:22, 180:2
petro [4] - 35:2, 36:20, 36:25, 39:23
PG [1] - 147:11
pH [1] - 109:21
Ph.D [2] - 28:13, 30:5
phone [1] - 35:19
PHONE [7] - 2:6, 2:13, 2:20, 3:7, 3:16, 3:22, 4:7
photo [3] - 110:19, 113:6, 117:22
photograph [11] - 105:20, 107:2, 107:15, 107:19, 107:25, 108:6, 108:9, 108:15, 112:4, 113:19, 153:18
photographs [7] - 96:21, 106:4, 107:10, 111:20, 129:23, 130:7, 140:17
photography [2] - 41:5
photos [1] - 116:14
phrase [1] - 13:4
phrased [1] - 129:3
physical [2] - 108:25, 124:12
physically [2] - 124:22, 174:17
picked [1] - 161:2
picogram [2] - 147:12, 147:19
picograms [2] - 148:3, 164:21
picture [7] - 43:13, 79:18, 113:12, 114:6, 115:22, 118:12, 118:19
pictures [1] - 43:7
piece [3] - 35:6, 127:18, 160:3
pieces [1] - 49:19
piezometers [1] - 162:1
pipe [6] - 68:25, 124:8, 161:19, 161:22, 161:24, 161:25
pit [30] - 20:22, 20:24, 26:3, 44:17, 44:19, 44:20, 44:22, 45:1, 45:4, 45:6, 45:14, 45:15, 60:13, 86:4, 91:14, 105:15, 108:19, 108:20, 111:25, 113:15, 113:16, 114:4, 114:5, 115:6, 118:17, 127:12, 138:18, 158:8
Pit [3] - 45:15, 104:17, 160:22
pits [62] - 10:12, 10:16, 12:7, 20:8, 22:18, 25:11, 26:19, 26:21, 27:2, 35:5, 35:8, 35:9, 36:23, 40:21, 42:20, 42:22, 45:8, 46:21, 58:1, 68:12, 72:14, 73:10, 74:21, 74:24, 85:9, 91:5, 99:6, 99:8, 100:2, 102:16, 104:5, 104:8, 104:10, 104:12, 104:17, 105:16, 106:4, 107:6, 107:9, 113:20, 114:2, 115:9, 117:21, 117:22, 118:1, 118:8, 118:14, 126:6, 126:9, 133:20, 139:9, 141:23, 142:5, 142:9, 142:16, 145:22, 154:12, 157:4, 158:3, 170:25, 173:21, 177:5
Pits [1] - 6:5
place [3] - 55:7, 99:18, 135:22
placed [6] - 56:6, 74:13, 75:2, 116:17, 126:9, 161:24
places [1] - 158:13
PLAINTIFF [2] - 2:3, 2:17
plaintiff [1] - 81:6
Plaintiff [1] - 1:4
plaintiff's [3] - 80:5, 81:4, 83:24
Plaintiffs' [6] - 17:13, 18:15, 81:7, 96:19, 97:6, 109:15
plane [1] - 43:7
planning [1] - 82:19
plant [44] - 20:3, 20:14, 20:21, 40:13, 42:12, 42:18, 42:20, 42:23, 42:25, 45:23, 47:14, 47:15, 47:16, 49:1, 49:4, 49:9, 50:4, 51:13, 51:19, 51:22, 52:5, 52:6, 52:23, 53:12, 53:13, 53:21, 58:1, 58:23, 59:20, 60:13, 62:1, 62:7, 62:8, 62:9, 67:10, 67:23, 73:9, 75:9, 75:11, 75:18, 77:13, 99:6, 124:11, 135:22
plants [1] - 49:25
plat [3] - 103:6, 103:11
plats [1] - 103:7
play [3] - 104:3, 116:2, 133:17
played [1] - 97:14
plenty [1] - 27:9
podium [1] - 28:11
POGGE [1] - 3:10
point [34] - 8:19, 10:5, 13:13, 15:17, 23:20, 26:14, 26:16, 32:20, 59:22, 76:2, 79:14, 80:13, 86:4, 87:12, 88:18, 90:20, 91:7, 92:13, 92:16, 93:23, 95:10, 95:11, 97:22, 99:23, 103:16, 111:16, 143:11, 145:25, 149:8, 149:23, 154:11, 165:12, 183:7
pointed [2] - 13:9, 139:18
pointer [7] - 30:10, 30:14, 43:25, 106:5, 139:16, 142:8, 160:13
points [2] - 134:4, 134:21
polluted [1] - 34:13
pollution [6] - 122:11, 136:12, 136:19, 137:2, 137:14, 174:11
Pollution [2] - 174:21, 182:24
pond [20] - 70:12, 70:15, 70:19, 70:21, 70:23, 71:4, 75:16, 80:21, 85:3, 86:1, 86:2, 86:8, 86:10, 98:15, 98:17, 159:6, 179:10
Pond [2] - 70:21, 70:23
ponds [4] - 74:7, 98:14, 98:24, 168:5
pool [5] - 46:15, 46:16, 46:17, 49:2, 49:16
pools [7] - 46:19, 46:22, 47:4, 49:3, 50:1, 52:2, 121:14
porous [2] - 159:1, 159:7
portion [16] - 14:7, 15:1, 56:11, 65:1, 86:13, 90:3, 90:11, 104:23, 105:12, 134:19, 136:11, 137:15, 139:11, 144:19, 154:25, 167:2
portions [6] - 78:20, 82:13, 111:24, 113:8, 113:20, 184:7
position [7] - 10:18, 14:5, 15:8, 16:1, 16:8, 23:5, 27:1
positions [5] - 15:18, 170:20, 175:18, 182:12, 182:22
possible [3] - 54:1, 98:20, 135:2
possibly [2] - 25:23, 98:16
poster [1] - 103:1
potential [3] - 10:21, 93:1, 178:24
potentially [1] - 93:5
practically [1] - 169:16
practice [6] - 33:10, 72:17, 72:19, 89:17, 89:20, 90:14
practices [1] - 68:12
preadmitted [9] - 18:5, 18:6, 18:14, 18:24, 19:4, 24:8, 25:25, 71:17, 178:14
preadmitting [1] - 19:6
precaution [1] - 136:3
predicate [1] - 83:2
predict [1] - 7:2
prefer [1] - 95:25
prejudice [1] - 11:22
prejudicial [6] - 7:24, 11:15, 18:9, 87:15, 150:10
presence [5] - 25:21, 27:7, 60:20, 61:10, 61:14
Present [2] - 96:25, 152:17
present [18] - 27:18, 57:1, 57:2, 57:18, 58:19, 63:19, 72:17, 78:3, 78:9, 78:15, 89:17, 104:1, 119:23, 126:5, 127:22, 136:13, 144:5, 158:2
present) [1] - 148:14
presented [8] - 11:1, 11:6, 12:15, 12:17, 16:5, 149:6, 149:19, 150:18
presents [1] - 67:16
preserve [1] - 94:20
Presiding [1] - 1:19
press [1] - 48:15
pretty [1] - 38:8
prevent [1] - 113:5
preview [2] - 63:1, 130:12
previous [7] - 91:3, 145:9, 145:10, 162:11, 164:7, 164:21, 164:23
previously [1] - 140:5
primarily [3] - 31:14, 109:21, 130:14
primary [2] - 52:2, 124:1
private [2] - 120:11, 133:9
probationary [1] - 32:7
probative [1] - 11:16
problem [16] - 11:13, 12:6, 14:6, 15:1, 34:13, 95:3, 95:5, 126:12, 136:12, 136:20, 137:2, 137:10, 137:14, 150:17, 150:22, 166:22

problems [3] - 10:21, 32:18, 133:19
proceed [6] - 27:24, 28:9, 28:10, 61:16, 95:23, 173:15
proceeding [2] - 83:17, 180:17
proceedings [14] - 1:19, 27:19, 57:14, 61:10, 76:19, 77:21, 90:1, 132:25, 137:25, 148:10, 166:6, 173:14, 184:8, 184:14
Proceedings [1] - 1:21
proceeds [1] - 180:1
process [28] - 13:16, 39:7, 39:12, 41:12, 42:12, 47:19, 48:23, 49:6, 49:11, 51:15, 52:14, 58:22, 69:15, 72:13, 73:18, 73:19, 73:20, 75:10, 86:21, 121:17, 121:18, 121:22, 126:23, 135:14, 141:17, 176:2, 177:11, 177:15
processes [7] - 36:22, 40:20, 41:18, 58:16, 59:20, 72:19, 89:19
processor [4] - 35:3, 36:20, 36:25, 39:24
produced [6] - 1:21, 5:14, 56:9, 60:13, 63:4, 121:20
product [3] - 36:21, 69:15, 69:16
production [1] - 19:17
products [3] - 48:3, 48:4, 48:21
professional [1] - 29:5
professor [5] - 28:19, 31:21, 31:23, 116:24, 116:25
professors [1] - 39:3
program [4] - 32:17, 33:24, 33:25, 34:3
programs [2] - 31:3, 31:6
prohibited [1] - 98:18
promised [1] - 183:5
proof [2] - 59:22, 184:16
proper [4] - 15:25, 95:18, 96:13, 98:19
properly [2] - 81:13, 87:15
properties [1] - 51:17
property [18] - 47:21, 103:13, 106:8, 106:9, 106:12, 106:22, 108:16, 121:13, 139:19, 140:13, 140:18, 142:11, 170:1, 170:25, 171:4, 174:18, 181:11
proposal [1] - 178:7
proposed [2] - 35:20, 180:17
protected [1] - 123:10
PROTECTION [1] - 2:18
provide [3] - 56:4, 133:24, 150:10
provided [3] - 53:11, 100:9, 148:20
provides [3] - 142:15, 172:13, 172:19
Proving [1] - 35:11
published [5] - 38:13, 38:17, 38:18, 81:19, 82:16
pull [24] - 23:11, 29:1, 43:3, 63:24, 68:5, 77:6, 97:5, 98:11, 99:25, 102:23, 105:22, 109:6, 115:16, 115:20, 120:14, 121:25, 127:5, 131:9, 133:5, 138:2, 138:25, 139:1, 171:10, 178:13
pulling [2] - 6:15, 148:16
pulls [2] - 66:14, 66:15
pump [14] - 49:22, 52:16, 66:14, 75:8, 75:17, 75:23, 75:24, 75:25, 76:10, 80:1, 124:17, 124:20, 124:22, 124:23
pumpable [1] - 123:2
pumping [5] - 54:8, 54:9, 75:17, 76:8, 88:8
purported [1] - 151:23
purpose [7] - 79:3, 104:9, 151:4, 152:1, 152:15, 160:2
purposes [7] - 12:5, 24:19, 26:2, 80:10, 95:12, 95:13, 151:13
push [2] - 127:18, 127:19
pushed [1] - 44:3
put [28] - 9:3, 10:12, 20:1, 21:19, 22:11, 22:16, 22:18, 23:16, 47:22, 52:8, 69:3, 75:24, 82:7, 92:1, 93:12, 110:21, 111:5, 117:13, 119:25, 125:13, 153:9, 158:22, 162:23, 163:3, 163:6, 165:14, 177:21, 178:3
putting [2] - 15:16, 37:19

Q

qualified [1] - 96:9
qualitatively [1] - 106:16
quality [6] - 56:8, 56:10, 56:12, 109:18, 119:5, 119:7
QUALITY [1] - 1:6
quantify [1] - 18:1
quantitatively [1] - 106:17
quantities [1] - 17:20
quantity [1] - 74:2
quarter [3] - 106:21, 106:22, 106:23
Quebedeaux [14] - 128:7, 128:15, 169:8, 174:5, 175:8, 177:3, 177:11, 178:20, 178:23, 179:11, 179:23, 180:11, 180:18, 180:25
Quebedeaux's [1] - 180:3
QUESTION [1] - 177:3
questioning [4] - 83:18, 91:18, 93:4, 128:12
QUESTIONS [2] - 28:16, 166:8
questions [6] - 58:22, 61:14, 63:2, 166:1, 166:16, 175:25
quick [3] - 57:16, 77:25, 126:9
quicker [1] - 134:22
quickly [2] - 97:23, 126:6
quite [2] - 35:19, 164:24
quote [2] - 13:17, 169:1

R

rabbit [1] - 95:19
rail [1] - 54:17
rain [2] - 134:2, 134:18
rains [2] - 134:23, 134:25
rainwater [1] - 126:22
raise [5] - 5:6, 9:25, 19:12, 28:4, 112:20
raised [2] - 14:25, 19:15
raising [1] - 7:4
ran [2] - 49:4, 75:8
rapidly [2] - 168:4, 168:7
rather [1] - 95:18
raw [1] - 68:24
re [1] - 61:9
re-takes [1] - 61:9
reached [2] - 37:22, 125:19
reaches [2] - 66:20, 66:24
reaching [1] - 136:8
react [1] - 48:1
read [32] - 21:5, 24:19, 24:20, 53:24, 54:16, 74:6, 88:11, 89:22, 98:12, 109:16, 109:24, 132:4, 133:12, 133:15, 135:11, 135:24, 136:11, 137:15, 140:3, 148:18, 167:10, 167:14, 167:23, 167:25, 168:1, 168:16, 168:22, 169:9, 169:12, 172:2, 172:4
reading [7] - 14:6, 15:1, 90:24, 93:1, 131:21, 136:15, 165:2
readings [4] - 144:19, 149:20, 163:8, 163:14
reads [3] - 38:24, 89:4, 90:10
ready [6] - 27:12, 27:24, 97:3, 135:15, 183:10, 183:12
real [6] - 67:12, 70:4, 71:20, 97:22, 112:15, 140:4
realize [1] - 136:1
really [19] - 39:7, 45:22, 91:19, 99:5, 100:15, 102:3, 114:15, 116:12, 117:7, 123:12, 124:24, 126:17, 153:12, 155:3, 155:4, 158:25, 160:4, 160:6, 160:7
reason [5] - 19:12, 20:24, 38:25, 78:4, 78:6
REASONER [7] - 3:8, 6:25, 7:25, 8:10, 8:25, 9:7, 51:3
rebuttal [1] - 149:17
recalled [1] - 9:1
recent [1] - 119:22
recently [2] - 64:14, 157:14
recess [1] - 183:13
recollection [1] - 176:14
recollections [1] - 78:10
reconsider [1] - 7:18
RECORD [2] - 1:1, 1:13
Record [3] - 1:21, 184:10, 184:14
record [9] - 5:3, 12:5, 81:3, 83:16, 83:23, 89:22, 96:5, 132:13, 141:5
records [7] - 40:13, 41:3, 45:19, 74:12, 87:18, 113:2, 140:9
recovered [1] - 149:4
recycled [1] - 109:5
red [1] - 142:10
redact [2] - 78:20, 79:18
redacted [14] - 60:24, 79:2, 80:5, 80:7, 80:10, 81:12, 81:13, 86:12, 87:15, 87:17, 90:4, 90:6, 90:11, 90:23
redaction [2] - 24:9, 78:21
redactions [4] - 18:18, 19:4, 87:21
reduced [1] - 134:20
reducing [1] - 140:9
Reese's [1] - 128:13
refer [3] - 84:1, 92:8, 92:9
reference [10] - 10:14, 14:16, 16:20, 18:23, 24:10, 24:13, 60:24, 94:15, 121:15, 145:25
referenced [4] - 82:11,

82:14, 137:14, 148:25
references [7] - 15:12, 57:23, 68:6, 86:8, 86:10, 145:8, 149:15
referencing [3] - 9:25, 88:24, 137:8
referral [1] - 6:3
referred [2] - 8:1, 15:21
referring [9] - 9:14, 10:2, 18:21, 50:19, 64:8, 91:14, 133:21, 134:2, 179:8
refers [5] - 6:2, 80:12, 80:20, 134:18, 135:22
reflect [4] - 5:9, 83:16, 87:9, 87:18
reflected [2] - 60:12, 63:4
reflecting [1] - 53:8
reflective [1] - 70:6
reflects [1] - 184:14
refresh [2] - 135:3, 176:14
regard [9] - 7:9, 9:25, 26:14, 26:25, 50:18, 81:13, 81:15, 96:9, 96:12
regarding [2] - 77:8, 89:13
regardless [1] - 91:14
regular [3] - 41:5, 121:17, 129:25
regulations [1] - 172:23
reinforcing [1] - 134:1
reject [1] - 39:5
relate [3] - 90:5, 90:12, 157:25
related [7] - 21:17, 80:19, 82:11, 82:13, 88:4, 133:20, 179:5
relates [5] - 17:18, 21:14, 80:16, 86:16, 139:7
relating [7] - 79:15, 79:17, 86:16, 86:22, 87:13, 88:13, 133:14
relatively [1] - 45:25
release [5] - 8:4, 8:5, 8:11, 140:23, 165:13
released [8] - 7:16, 7:20, 8:18, 12:16, 100:9, 118:13, 118:16, 154:1
releases [1] - 142:16
releasing [1] - 162:14
relevance [2] - 11:22, 36:18
relevant [9] - 11:24, 12:12, 21:1, 23:25, 24:4, 26:14, 41:17, 95:12, 95:13
relied [1] - 171:17
rely [1] - 8:20
relying [3] - 8:15, 9:10, 149:25
remain [1] - 105:19
remained [1] - 35:10
remaining [1] - 85:2
remains [1] - 52:12
Remedial [1] - 141:15
remediating [2] - 13:20, 14:3
remediation [1] - 14:17
remember [12] - 9:8, 14:4, 94:17, 97:8, 123:25, 125:7, 125:14, 164:23, 166:24, 167:10, 167:12, 168:25
remind [4] - 55:6, 99:3, 125:18, 181:8
removal [3] - 74:8, 87:24, 89:21
remove [5] - 79:19, 80:24, 87:5, 87:10, 121:16
removed [3] - 85:10, 109:19, 167:19
removing [4] - 86:16, 86:18, 86:22, 168:5
render [1] - 169:16
renew [1] - 118:21
reorient [2] - 105:23, 167:2
rep [1] - 23:3
rep's [1] - 25:3
repair [1] - 132:15
repaired [4] - 126:15, 129:24, 132:3, 132:9
repeated [2] - 62:13, 65:13
repeatedly [1] - 65:13
rephrase [3] - 50:9, 55:19, 115:4
report [9] - 5:23, 26:17, 91:1, 98:7, 105:25, 122:10, 135:7
reported [6] - 1:21, 6:6, 109:25, 168:4, 168:17, 184:12
reporter [9] - 57:13, 76:18, 77:20, 89:25, 132:24, 137:24, 148:9, 166:5, 173:13
Reporter [2] - 184:3, 184:22
Reporter's [3] - 1:21, 184:9, 184:13
REPORTER'S [2] - 1:1, 1:13
represent [2] - 158:13, 166:10
representative [12] - 23:7, 25:7, 170:6, 170:10, 170:19, 170:23, 173:1, 173:7, 173:10, 173:19, 176:8, 181:23
represents [1] - 154:11
request [4] - 6:3, 24:23, 81:2, 87:16
requested [1] - 184:8
require [2] - 94:21, 132:15
required [6] - 5:24, 14:8, 14:9, 92:20, 94:19, 172:21
requirements [1] - 96:7
research [11] - 30:8, 30:13, 30:17, 30:23, 31:5, 31:9, 31:10, 31:15, 31:16, 32:9, 32:17
researching [1] - 35:9
resembled [1] - 109:22
resolution [2] - 140:1, 140:3
resolve [2] - 35:16, 150:15
resolved [1] - 140:4
resources [1] - 30:13
respect [7] - 14:2, 33:21, 64:2, 79:13, 125:4, 148:25, 165:23
respects [1] - 172:6
respond [10] - 15:14, 15:18, 16:5, 16:12, 16:16, 17:4, 39:6, 84:6, 85:19, 93:15
response [3] - 5:11, 5:13, 40:1
responsible [3] - 53:13, 173:2, 173:20
responsive [1] - 6:23
rest [1] - 146:19
restroom [1] - 78:1
result [4] - 5:24, 70:7, 74:8, 81:25
results [33] - 61:20, 61:25, 62:1, 62:4, 62:5, 62:15, 63:10, 64:2, 64:12, 64:15, 64:20, 64:23, 65:10, 68:10, 68:18, 71:2, 71:3, 71:4, 71:12, 71:20, 79:15, 79:20, 81:16, 81:22, 84:23, 84:25, 85:1, 85:2, 85:8, 86:1, 159:25, 160:25, 162:25
resume [3] - 28:21, 28:22, 32:9
resumed [1] - 135:18
return [1] - 39:11
review [20] - 39:7, 39:13, 39:17, 42:15, 50:10, 50:15, 50:21, 53:10, 53:17, 57:4, 65:5, 74:15, 74:25, 87:21, 96:4, 108:23, 129:9, 136:25, 137:12, 140:16
reviewed [8] - 17:5, 38:19, 39:2, 41:14, 76:3, 102:16, 112:20, 133:7
reviewer [1] - 39:8
reviewing [1] - 6:6
revolution [1] - 34:12
Rhodes [1] - 30:2
Rice [1] - 116:24
ride [1] - 75:24
rigorous [1] - 39:7
river [47] - 34:9, 34:11, 34:13, 34:16, 34:24, 43:10, 76:24, 77:10, 82:18, 91:16, 92:6, 92:21, 93:9, 93:14, 94:14, 94:22, 99:8, 100:8, 100:10, 100:21, 101:16, 104:6, 114:8, 119:2, 126:2, 126:21, 128:5, 130:9, 131:1, 140:23, 140:24, 144:5, 144:24, 145:8, 149:7, 149:23, 150:2, 153:5, 153:10, 153:11, 154:5, 154:24, 155:18, 155:20, 159:6, 159:15
River [29] - 6:5, 21:3, 26:20, 43:10, 85:3, 85:13, 85:15, 86:4, 99:20, 100:21, 105:14, 114:23, 114:24, 115:7, 115:11, 115:12, 115:14, 117:23, 118:1, 118:19, 129:21, 131:4, 136:14, 140:5, 141:22, 159:10, 169:17, 170:2, 179:11
road [1] - 104:1
ROBIN [1] - 3:8
rOCK [1] - 2:14
role [5] - 30:7, 97:15, 104:3, 116:2, 133:18
room [3] - 52:13, 53:21, 176:3
ROSS [1] - 3:11
Rouge [2] - 29:8, 35:3
roughly [1] - 67:12
Rule [1] - 11:16
rule [1] - 27:17
rules [1] - 172:23
ruling [1] - 79:4
rulings [9] - 7:10, 10:10, 10:18, 11:6, 11:11, 11:21, 11:23, 12:1, 81:9
run [1] - 49:15
runs [1] - 155:20
rushed [1] - 161:22
Rutgers [1] - 34:18
RYAN [1] - 2:11

S

safety [1] - 38:12
sample [9] - 66:15, 127:20, 154:14, 156:19, 160:8, 162:17, 164:19, 165:1, 165:13
sampled [1] - 161:23
samples [4] - 41:13, 80:21, 154:12, 158:15
sampling [2] - 6:6, 163:1
San [32] - 6:5, 21:3, 26:20, 43:9, 85:3, 85:13, 85:15, 86:4, 99:20, 100:20, 102:16, 105:14, 114:23, 114:24, 115:7, 115:11, 115:12, 115:14, 117:23, 117:25, 118:18, 129:21, 131:4, 136:14, 140:5, 141:22, 145:13, 159:10, 160:19, 169:17,

170:2, 179:11
sand [7] - 119:24, 127:24, 128:3, 131:1, 158:21, 159:2
sands [1] - 126:20
satellite [1] - 107:12
satisfactory [1] - 179:19
saturated [2] - 125:10, 125:12
save [1] - 128:12
saved [1] - 41:3
saw [5] - 9:11, 129:23, 130:1, 162:12
scale [2] - 144:24, 147:2
scales [1] - 11:17
scheme [1] - 122:23
SCHRADER [46] - 3:19, 10:22, 11:9, 12:13, 12:19, 13:2, 13:5, 13:12, 50:7, 53:5, 55:16, 57:8, 58:3, 58:7, 59:10, 59:19, 61:4, 61:8, 62:22, 64:5, 115:1, 118:21, 123:14, 129:2, 129:13, 136:21, 137:5, 137:18, 148:5, 150:8, 150:12, 150:17, 150:23, 151:21, 166:8, 167:1, 167:8, 169:4, 169:10, 171:10, 172:17, 173:17, 176:20, 177:21, 178:13, 183:5
Schrader [3] - 166:10, 173:16, 177:24
science [1] - 39:16
sciences [1] - 30:3
scientific [1] - 41:16
scope [1] - 123:15
Screen [1] - 19:11
screen [3] - 104:25, 110:25, 113:22
screening [2] - 6:1, 6:4
scroll [7] - 63:25, 108:13, 116:14, 143:15, 143:24, 156:10, 156:16
scrolling [1] - 111:20
sea [10] - 54:10, 54:13, 54:20, 55:15, 104:15, 104:18, 105:2, 105:4, 106:15, 106:25
seated [9] - 27:21, 28:7, 57:20, 63:20, 78:5, 97:1, 133:2, 148:15, 152:18
second [34] - 24:13, 39:1, 40:19, 51:23, 56:13, 56:22, 63:24, 67:6, 73:15, 73:24, 73:25, 80:8, 80:11, 84:6, 91:12, 98:15, 98:17, 99:10, 100:4, 109:11, 122:17, 123:19, 126:11, 127:12, 131:12, 134:8, 137:22, 163:3, 167:9, 167:15, 167:17, 167:21, 169:11, 169:12
secondary [4] - 52:8, 122:24, 125:9, 135:23
section [2] - 109:18, 134:8
secure [1] - 172:20
sediment [3] - 34:15, 126:2, 131:1
sediments [2] - 34:19, 149:13
see [89] - 23:22, 26:7, 38:1, 42:16, 43:8, 43:15, 56:16, 62:5, 65:19, 67:17, 67:20, 68:17, 69:18, 76:22, 77:8, 84:4, 97:20, 100:21, 100:22, 100:24, 101:2, 101:3, 101:15, 101:17, 104:14, 105:4, 105:13, 105:20, 106:2, 106:11, 107:4, 107:5, 107:7, 108:1, 108:3, 111:14, 112:3, 112:5, 112:6, 112:7, 113:2, 113:3, 113:13, 113:14, 113:24, 114:2, 114:3, 115:13, 116:9, 116:10, 116:12, 116:15, 117:21, 118:4, 118:5, 118:7, 124:9, 126:12, 129:21, 130:5, 130:6, 132:4, 133:15, 136:14, 142:1, 144:19, 146:1, 154:15, 156:1, 156:5, 157:3, 157:8, 161:14, 162:12, 162:21, 164:19, 164:22, 169:7, 171:21, 176:13, 177:21, 178:10, 178:18, 179:20, 183:10, 183:11
seeing [1] - 107:14
seeking [2] - 87:6, 87:10
seepage [2] - 98:16, 169:16
send [2] - 38:23, 39:2
sense [2] - 15:4, 58:21
sensitive [7] - 10:5, 10:12, 10:20, 11:25, 16:25, 94:24, 136:1
sensitivity [1] - 93:24
sent [3] - 19:21, 42:12, 50:5
sentence [17] - 54:21, 64:13, 67:5, 67:6, 86:25, 89:21, 98:4, 109:24, 123:6, 123:20, 131:18, 139:14, 139:18, 168:2, 168:14, 169:11, 169:12
sentences [1] - 24:20
separate [3] - 16:9, 44:4, 88:21
separated [1] - 127:12
separately [3] - 50:22, 82:23, 94:2
separating [2] - 16:25, 155:4
September [14] - 6:7, 22:4, 23:4, 25:10, 26:18, 26:22, 51:8, 55:5, 56:2, 65:6, 73:4, 126:7, 133:21, 135:7
series [1] - 49:22
serve [4] - 39:8, 139:10, 139:20, 170:5
service [2] - 30:8, 32:9
set [6] - 38:21, 56:22, 121:17, 135:14, 156:9, 168:18
sets [1] - 122:21
settle [5] - 49:20, 52:11, 52:13, 101:4, 102:8
settleable [4] - 101:2, 101:6, 101:18, 102:2
settled [2] - 72:18, 89:18
settles [1] - 52:15
settling [2] - 54:2, 178:25
setup [1] - 35:4
seven [2] - 10:15, 32:7
seven-year [1] - 32:7
several [2] - 69:1, 89:7
sewage [4] - 68:24, 68:25, 69:11
sewer [2] - 122:18, 123:8
shadow [1] - 34:10
shall [2] - 172:19, 172:22
shallow [3] - 66:23, 158:16, 160:7
shape [3] - 44:22, 98:16, 106:2
sharp [1] - 161:20
sheet [1] - 64:3
shield [1] - 15:9
Ship [5] - 75:19, 145:13, 154:7, 154:8, 155:21
shipments [1] - 19:21
shipped [1] - 17:21
shoot [1] - 105:18
shore [2] - 54:23, 55:25
short [2] - 78:13, 168:18
short-circuiting [1] - 78:13
shoulder [1] - 131:12
shoved [1] - 161:20
show [30] - 9:2, 20:13, 59:14, 60:2, 60:11, 69:21, 88:22, 102:9, 104:16, 106:7, 111:24, 113:8, 113:20, 113:21, 128:1, 142:18, 143:10, 143:17, 144:25, 146:10, 149:25, 150:2, 150:25, 151:14, 151:18, 151:24, 157:1, 159:19, 159:25, 164:18
showed [4] - 79:18, 82:15, 128:2, 145:9
showing [13] - 12:6, 82:19, 142:21, 144:6, 144:22, 144:23, 145:7, 146:24, 146:25, 148:2, 151:23, 156:15, 156:16
shown [1] - 143:11
shows [12] - 20:15, 59:2, 60:1, 80:15, 108:3, 108:15, 108:16, 150:5, 151:19, 154:5, 155:14, 158:12
shred [1] - 47:21
shut [1] - 53:22
shuts [1] - 49:8
sic) [1] - 68:6
side [6] - 43:10, 44:16, 104:13, 107:6, 107:8, 113:16
sides [3] - 13:9, 128:16, 169:15
sides' [1] - 11:24
signature [1] - 6:9
significant [8] - 68:17, 69:18, 73:6, 73:16, 113:12, 116:10, 134:16, 134:19
silly [1] - 114:20
silt [5] - 119:24, 127:24, 128:4, 131:1, 159:2
silts [1] - 126:20
similar [10] - 35:4, 36:21, 37:9, 38:8, 41:17, 54:19, 62:5, 65:9, 66:3, 124:14
similarity [1] - 63:11
similarly [2] - 36:24, 37:11
simple [2] - 43:21, 69:9
sit [3] - 18:18, 115:18, 175:24
site [68] - 6:1, 6:4, 13:20, 14:3, 18:2, 19:22, 21:8, 21:9, 22:3, 22:11, 26:19, 32:16, 33:9, 34:8, 35:3, 35:4, 35:5, 35:16, 35:18, 36:20, 36:25, 39:24, 41:10, 41:13, 41:17, 53:20, 54:18, 55:1, 67:23, 71:14, 79:10, 81:1, 87:14, 103:22, 103:23, 110:2, 112:21, 112:25, 119:24, 120:1, 122:18, 123:8, 125:25, 126:5, 126:6, 126:13, 130:10, 132:6, 139:10, 139:20, 140:6, 140:7, 143:2, 143:3, 143:4, 143:12, 143:18, 150:19, 151:24, 158:7, 159:21, 159:23, 160:5, 167:19, 175:5, 181:2

sites [16] - 31:14, 31:16, 31:17, 34:4, 34:7, 34:16, 34:21, 34:25, 38:20, 39:25, 54:6, 80:6, 80:8, 129:5, 129:8, 142:17
sits [2] - 52:9, 52:18
sitting [1] - 161:13
situation [1] - 125:2
situations [2] - 12:3, 33:16
six [1] - 51:2
size [5] - 49:23, 101:12, 101:23, 101:25
sized [2] - 46:22, 121:14
SJMW [1] - 160:20
SJMWS04 [1] - 163:11
sketch [1] - 29:4
skipped [1] - 127:14
slight [1] - 98:16
slope [2] - 134:3, 134:19
slow [1] - 49:17
slower [1] - 132:12
slowly [3] - 75:16, 83:17, 114:14
sludge [102] - 17:20, 18:1, 19:17, 19:18, 20:1, 20:2, 20:14, 21:13, 22:11, 22:18, 23:17, 42:12, 42:16, 42:17, 42:19, 45:18, 46:3, 46:22, 46:24, 46:25, 47:1, 47:3, 47:4, 47:11, 47:14, 48:21, 49:12, 50:4, 50:13, 50:16, 50:18, 51:11, 51:15, 51:19, 51:22, 52:1, 52:13, 53:23, 54:2, 54:4, 54:6, 54:9, 54:13, 54:17, 54:19, 54:23, 54:25, 55:14, 55:25, 56:6, 56:25, 57:23, 58:5, 58:23, 58:24, 59:3, 59:7, 59:13, 62:1, 62:6, 63:2, 63:4, 64:3, 64:15, 64:17, 65:1, 65:5, 65:10, 65:17, 65:20, 66:18, 66:22, 67:7, 67:8, 67:22, 68:16, 72:14, 73:7, 74:17, 74:22, 74:23, 75:1, 75:4, 75:10, 108:24, 110:20, 111:5, 120:21, 122:18, 122:24, 123:8, 123:20, 124:11, 124:20, 125:15, 126:8, 126:16, 133:14, 178:24, 179:3
slurry [1] - 124:24
small [8] - 37:25, 43:19, 100:6, 100:12, 100:15, 100:18, 102:4, 147:12
smaller [4] - 101:14, 147:19, 147:21, 147:22
smoother [1] - 152:16
so.. [1] - 59:18
soda [1] - 47:24
sodium [1] - 47:24
softer [1] - 110:23
soil [5] - 44:3, 124:25, 126:18, 127:16, 128:21
soils [1] - 119:23
solid [14] - 49:21, 52:7, 52:20, 64:2, 65:4, 66:1, 75:7, 75:14, 102:3, 125:1, 125:15, 125:18, 157:13
solidifies [1] - 168:7
solidify [2] - 110:23, 168:3
solids [18] - 52:10, 52:11, 52:15, 52:21, 65:7, 69:23, 71:7, 72:18, 75:1, 89:18, 101:6, 101:18, 123:25, 124:3, 124:5, 124:21, 124:23, 125:20
solubility [7] - 37:9, 37:12, 37:22, 37:23, 38:3, 38:6, 38:7
soluble [2] - 37:18, 38:9
someone [3] - 8:22, 33:11, 94:2
sometime [1] - 135:6
sometimes [2] - 129:10, 176:3
somewhere [3] - 46:7, 70:20, 106:22
soon [2] - 27:3, 98:20
sorry [13] - 8:25, 18:12, 19:11, 74:3, 77:2, 81:7, 88:16, 143:25, 156:3, 163:2, 163:22, 169:5, 180:8
sort [12] - 34:20, 40:15, 51:13, 56:22, 69:25, 73:11, 75:15, 75:16, 113:4, 116:12, 183:6
sorted [1] - 25:20
sought [1] - 87:24
sound [2] - 114:20, 171:24
sounds [3] - 60:5, 69:8, 171:25
source [2] - 42:21, 75:13
south [6] - 18:19, 31:10, 80:21, 85:7, 85:9, 145:19
southern [40] - 17:19, 18:22, 19:9, 19:14, 20:16, 20:25, 21:19, 24:1, 24:3, 26:10, 78:17, 78:22, 78:23, 79:5, 79:16, 79:17, 79:19, 79:25, 80:1, 80:12, 80:17, 80:18, 80:25, 81:13, 81:23, 82:1, 82:3, 82:12, 82:13, 83:6, 84:2, 84:10, 85:6, 85:7, 85:12, 87:5, 87:7, 88:13, 88:25, 93:7
southwest [1] - 31:10
space [1] - 146:13
sparingly [1] - 38:9
speaking [2] - 32:23, 33:1
special [1] - 136:2
specific [2] - 8:4, 17:6
specifically [7] - 6:2, 10:1, 16:17, 16:20, 20:5, 68:15, 80:20
speculation [6] - 55:17, 57:9, 129:2, 136:22, 137:6, 137:19
spell [1] - 162:2
spend [1] - 93:6
spent [2] - 42:1, 153:22
spill [1] - 40:4
spoil [1] - 54:9
spoken [1] - 183:2
spot [1] - 154:17
stability [2] - 149:18, 150:1
stable [2] - 36:2, 149:1
stamp [1] - 97:20
stamped [2] - 87:1, 98:3
stand [16] - 22:16, 28:3, 29:20, 58:12, 61:9, 61:13, 61:21, 66:18, 66:23, 82:8, 96:24, 103:16, 103:18, 104:20, 133:1, 168:6
standard [1] - 32:11
standpoint [1] - 10:19
stands [3] - 160:20, 164:13, 168:8
STANFIELD [8] - 3:18, 23:2, 23:9, 24:9, 24:17, 25:4, 25:8, 102:23
start [24] - 22:4, 24:20, 27:14, 29:23, 30:1, 34:11, 40:8, 86:10, 107:7, 108:1, 113:14, 114:1, 116:12, 135:4, 135:15, 139:1, 141:13, 146:1, 147:16, 160:17, 166:23, 183:10, 183:12
started [5] - 17:23, 21:12, 30:4, 47:4, 73:10
starting [8] - 11:7, 11:11, 25:6, 99:14, 107:7, 114:3, 139:17, 141:23
starts [3] - 10:9, 145:12, 154:9
state [12] - 5:14, 28:20, 30:18, 30:21, 30:22, 31:6, 31:20, 34:1, 97:18, 155:9, 167:4, 172:23
STATE [3] - 1:4, 2:17, 184:1
State [5] - 71:13, 73:15, 76:21, 97:11, 184:5
state's [1] - 5:11
State's [1] - 15:8
state_A0309862 [1] - 5:17
statement [7] - 6:17, 6:20, 56:1, 76:13, 94:1, 177:6, 179:16
statements [6] - 15:13, 16:13, 16:15, 17:3, 77:8, 93:16
states [4] - 30:20, 55:24, 139:18, 158:23
States [1] - 34:12
STATION [1] - 2:19
stay [2] - 32:13, 62:24
stays [3] - 116:16, 124:2, 124:4
stenotype [1] - 1:21
step [3] - 127:14, 132:22, 148:12
Stewart [1] - 31:23
stick [2] - 109:1, 126:19
still [13] - 19:8, 29:13, 47:19, 52:19, 106:19, 106:25, 125:8, 155:12, 157:8, 162:7, 165:15, 168:8, 168:12
stipulation [12] - 13:25, 14:1, 14:7, 14:24, 15:1, 24:21, 93:2, 93:19, 94:9, 95:17, 95:25, 171:21
stir [1] - 114:12
stood [1] - 91:20
stop [6] - 23:10, 44:2, 72:16, 86:5, 154:18, 158:17
storage [1] - 67:8
storing [1] - 179:10
straighten [1] - 78:25
straightforward [1] - 45:25
STRAWN [1] - 4:5
stream [1] - 122:11
STREET [3] - 2:5, 3:15, 4:6
strengthening [1] - 113:4
stricken [1] - 81:3
strike [1] - 123:15
strong [2] - 70:4, 126:14
structure [2] - 36:10, 44:3
student [2] - 33:11, 38:21
students [5] - 33:7, 33:22, 33:25, 37:4, 38:12
studies [3] - 37:5, 37:8, 39:21
study [6] - 34:2, 34:14, 34:18, 40:23, 41:12, 141:19
Study [1] - 141:16
studying [1] - 41:10
stuff [11] - 50:3, 52:3, 52:5, 67:10, 69:9, 98:8, 100:22, 101:17, 131:20, 133:11, 159:12
styled [1] - 184:10
styrofoam [1] - 110:7
submerged [10] -

99:24, 100:8, 104:6, 104:17, 105:7, 105:8, 105:14, 105:16, 105:19, 129:20
submit [2] - 39:2, 39:10
subparagraph [1] - 172:18
substance [3] - 31:10, 36:12, 111:9
substitute [1] - 37:5
substitution [1] - 37:2
successfully [1] - 110:1
suck [1] - 69:4
sucking [1] - 161:23
sugar [3] - 37:19, 37:20
suggest [2] - 92:19, 94:4
suggested [2] - 92:4, 92:23
suggesting [1] - 93:8
suggestion [3] - 94:11, 94:12, 151:22
suggests [1] - 111:1
suit [1] - 80:10
SUITE [2] - 3:6, 3:15
suits [1] - 79:3
sulfide [1] - 47:25
sum [1] - 140:10
summarize [1] - 152:22
Superfund [6] - 13:16, 34:16, 34:25, 35:16, 141:16, 143:4
superintendent [1] - 131:24
supplement [3] - 5:22, 148:19, 148:21
supplemental [1] - 148:25
support [4] - 84:7, 149:1, 153:25, 154:3
supports [3] - 150:25, 151:14, 165:21
supposed [2] - 9:3, 87:19
surface [18] - 114:9, 114:14, 117:1, 149:12, 153:4, 153:21, 156:21, 158:20, 159:1, 159:4, 159:5, 159:8, 159:11, 159:16, 160:8, 160:20, 160:21, 161:13
surrogate [1] - 37:2
surrounding [3] - 119:11, 143:17, 143:18
survey [14] - 54:1, 96:20, 102:15, 103:6, 103:7, 103:11, 104:3, 104:8, 105:3, 105:9, 105:25, 106:20, 115:19
surveyor [3] - 104:14, 104:18, 106:1
suspended [1] - 149:13
sustain [1] - 60:10
sustained [5] - 60:6, 123:17, 129:3, 129:15, 138:1
swear [1] - 176:4
swim [1] - 71:9
swimming [9] - 46:15, 46:16, 46:17, 49:2, 49:3, 49:16, 50:1, 52:2, 121:14
switched [1] - 11:17
sword [1] - 15:9
sworn [3] - 28:5, 28:6, 28:14
SYDNEY [1] - 3:10
system [5] - 31:4, 32:6, 33:19, 69:7, 135:22
systems [2] - 44:5, 47:13

T

Tab [2] - 169:5, 180:8
table [12] - 55:22, 72:1, 143:20, 145:23, 146:6, 153:24, 153:25, 155:16, 162:25, 164:1, 165:20, 175:24
tables [2] - 148:19, 157:11
tabulated [1] - 54:4
Talboys [5] - 53:4, 53:8, 53:10, 53:16, 53:19
talks [3] - 84:10, 84:23, 90:23
target [1] - 161:11
TCDD [3] - 147:10, 149:11, 164:13
TCDF [1] - 149:11
TCEQ [11] - 5:14, 6:3, 6:4, 6:12, 6:19, 15:13, 15:21, 16:13, 16:16, 16:18, 17:3
tea [1] - 37:19
teach [1] - 33:11
teaching [4] - 30:8, 32:9, 33:7, 33:21
Tech [1] - 34:18
technically [1] - 59:5
technique [1] - 34:15
technology [2] - 35:17, 39:16
telephone [1] - 180:16
tend [3] - 34:25, 36:7, 100:17
tendency [2] - 38:3, 144:20
tendered [2] - 122:7, 184:15
tendered) [3] - 21:23, 51:1, 176:23
tends [3] - 36:7, 37:9, 70:4
tenure [2] - 32:3, 32:6
term [9] - 37:12, 46:24, 47:11, 47:12, 47:14, 68:21, 130:21, 130:22, 158:18
termed [1] - 134:9
terms [5] - 10:8, 34:17, 63:10, 94:2, 140:1
test [23] - 61:20, 61:25, 62:1, 62:15, 64:1, 64:12, 64:20, 64:23, 65:9, 68:10, 68:18, 70:7, 71:3, 71:4, 71:5, 71:12, 71:20, 81:22, 81:25, 84:23, 84:25, 85:1, 85:2
testified [4] - 23:3, 28:14, 88:12, 175:9
testify [1] - 181:23
testifying [2] - 168:25, 176:5
testimony [9] - 8:4, 25:3, 62:21, 63:9, 95:6, 96:10, 137:20, 168:25, 170:20
testing [16] - 6:10, 6:11, 57:24, 59:1, 59:12, 62:4, 62:5, 63:10, 67:25, 69:23, 71:1, 79:15, 79:20, 81:16, 163:18, 163:19
tests [3] - 62:11, 64:14, 68:13
tetrachloro [1] - 164:14
TEXAS [14] - 1:4, 1:5, 1:5, 1:11, 2:6, 2:12, 2:17, 2:18, 2:19, 3:4, 3:6, 3:16, 4:6, 184:1
Texas [13] - 1:20, 34:18, 39:22, 64:21, 68:10, 71:13, 73:15, 96:8, 127:14, 184:5, 184:21, 184:23, 184:24
text [1] - 77:2
THE [188] - 1:4, 1:4, 2:3, 2:11, 2:17, 2:18, 3:4, 3:14, 5:3, 5:25, 6:20, 6:24, 7:7, 8:6, 8:12, 9:5, 9:8, 9:24, 11:4, 11:10, 11:19, 12:18, 12:21, 13:3, 13:6, 14:4, 14:12, 14:15, 15:5, 15:10, 15:19, 15:24, 16:15, 16:23, 17:2, 18:15, 18:21, 19:8, 19:11, 19:23, 20:12, 20:20, 20:23, 21:16, 22:17, 22:22, 23:13, 23:22, 24:16, 24:18, 24:24, 25:1, 25:16, 26:1, 26:12, 27:3, 27:12, 27:20, 28:4, 28:12, 50:9, 50:19, 50:25, 55:20, 57:11, 57:15, 57:20, 58:4, 58:8, 58:18, 58:25, 59:16, 59:24, 60:7, 60:9, 60:17, 61:2, 61:6, 61:12, 62:20, 62:23, 63:8, 63:14, 63:17, 63:20, 64:8, 68:8, 76:16, 77:18, 77:24, 78:4, 78:18, 79:7, 79:12, 80:3, 81:11, 81:20, 81:24, 82:6, 82:9, 82:19, 82:22, 83:8, 84:4, 84:18, 85:16, 85:22, 85:25, 86:5, 86:9, 86:25, 87:2, 87:22, 88:3, 88:20, 89:2, 89:4, 89:10, 89:17, 89:22, 90:2, 90:8, 90:24, 91:3, 91:7, 91:9, 91:12, 91:17, 91:24, 92:15, 92:25, 93:18, 93:24, 94:17, 94:23, 95:3, 96:3, 96:11, 96:16, 96:18, 96:23, 97:1, 102:20, 102:25, 103:18, 115:3, 118:23, 119:1, 122:6, 123:17, 129:3, 129:15, 131:13, 132:20, 133:1, 136:23, 137:7, 137:21, 138:1, 138:10, 141:4, 148:7, 148:11, 148:15, 148:21, 149:10, 149:24, 150:7, 150:14, 150:20, 150:24, 151:10, 152:1, 152:8, 152:10, 152:15, 152:18, 157:20, 166:2, 166:3, 170:14, 173:11, 173:15, 176:22, 177:23, 183:8, 184:1
themselves [1] - 157:4
therefore [3] - 58:4, 112:18, 130:1
thereto [1] - 172:24
thesis [1] - 35:23
they've [1] - 79:3
thinks [1] - 137:9
third [15] - 24:14, 41:15, 79:14, 82:17, 82:20, 83:15, 106:23, 114:4, 121:6, 127:12, 139:13, 139:14, 153:12, 162:22, 162:24
thirds [1] - 51:24
thousands [1] - 101:22
three [16] - 6:19, 16:14, 29:12, 35:21, 43:14, 43:15, 43:16, 66:24, 74:21, 74:24, 75:2, 99:25, 118:8, 132:11, 132:15, 134:1
throughout [3] - 13:8, 62:11, 149:21
throw [2] - 49:14, 66:18
thrown [1] - 66:22
tidal [2] - 99:21, 153:4
tides [3] - 105:7, 106:18, 130:13
tied [2] - 151:19, 152:12
timeline [6] - 40:15, 40:17, 99:5, 123:11, 178:9, 180:13
tiny [4] - 147:24, 147:25, 153:12, 155:4
tip [1] - 161:20

title [2] - 6:17, 162:23
today [7] - 7:6, 17:9, 32:21, 39:18, 47:20, 164:8, 173:7
today's [1] - 110:5
together [10] - 30:20, 42:5, 44:4, 45:12, 54:4, 75:17, 109:2, 119:25, 126:19, 155:6
took [8] - 41:13, 55:7, 94:18, 120:21, 124:16, 132:18, 161:19, 162:17
top [19] - 30:11, 31:7, 52:12, 55:4, 56:13, 56:15, 64:11, 64:19, 97:17, 145:1, 146:7, 147:1, 154:14, 154:16, 154:25, 161:13, 162:15, 162:16
topic [2] - 173:7, 173:9
total [2] - 121:11, 143:3
totally [5] - 18:8, 124:17, 124:19, 125:2, 125:5
toward [1] - 9:22
TOWER [1] - 2:5
toxic [2] - 109:21, 111:15
toxins [2] - 7:16, 8:17
track [1] - 160:25
tracked [1] - 37:1
tract [1] - 106:24
trail [1] - 95:19
training [2] - 29:23, 30:4
transcript [7] - 5:8, 8:3, 11:20, 16:12, 17:6, 18:25, 176:21
transcription [2] - 1:22, 184:7
transport [2] - 165:11, 171:7
transported [1] - 100:19
transporting [1] - 54:5
travel [1] - 42:4
traveling [1] - 150:19
TRAVIS [1] - 2:5
treat [1] - 49:15
treatment [2] - 47:13, 49:15
tree [2] - 47:20, 48:1
tremendous [1] - 48:25
TRIAL [1] - 1:2
trial [20] - 1:18, 10:23, 10:24, 12:12, 16:24, 19:13, 22:19, 26:4, 81:5, 81:7, 83:24, 93:5, 93:10, 93:11, 94:10, 95:12, 95:14, 123:3, 175:16
tricky [1] - 15:19
trouble [3] - 21:7, 107:14, 107:17
trucking [1] - 54:19
true [3] - 58:18, 170:23, 184:6
truly [1] - 184:14
truth [1] - 176:4
try [9] - 23:11, 26:25, 29:21, 30:20, 31:18, 33:13, 34:14, 136:24, 152:21
trying [9] - 27:5, 31:5, 46:14, 83:18, 92:16, 92:19, 95:20, 159:19, 159:20
TSUCHIYAMA [1] - 2:8
tube [1] - 161:23
Tuesday [1] - 183:11
turn [6] - 7:21, 9:18, 33:11, 48:13, 73:25, 145:23
twice [1] - 150:11
two [56] - 9:2, 9:11, 9:12, 9:19, 14:20, 20:16, 24:20, 40:11, 44:5, 47:25, 51:12, 51:24, 53:1, 53:2, 58:9, 59:5, 63:9, 66:24, 74:7, 75:3, 77:4, 77:7, 79:2, 82:15, 82:16, 83:23, 83:25, 88:11, 95:21, 97:19, 98:11, 98:13, 98:24, 101:5, 101:10, 101:11, 102:6, 104:12, 115:9, 125:5, 128:6, 134:4, 138:22, 139:25, 144:2, 144:6, 154:16, 154:19, 154:21, 155:5, 157:4, 157:11, 161:12, 176:7
two-and-a-half [1] - 75:3
two-thirds [1] - 51:24
twofold [1] - 11:21
tying [2] - 151:11, 151:17
type [8] - 9:23, 29:15, 33:5, 33:17, 33:19, 89:4, 155:1, 164:8
types [2] - 103:14, 161:5
typical [1] - 130:25

U

U.S [1] - 35:13
UAO [3] - 6:11, 13:22, 14:13
ultimately [3] - 73:12, 73:13, 138:18
uncertainty [1] - 70:22
under [13] - 11:16, 13:22, 24:12, 90:3, 90:10, 105:14, 114:21, 115:9, 115:13, 115:14, 122:17, 129:20, 149:21
undergraduate [2] - 33:22, 33:23
underscore [1] - 5:14
understood [5] - 12:13, 73:19, 92:13, 170:9, 170:18
undertaken [1] - 73:20
underwater [4] - 105:21, 112:1, 113:9, 125:3
undisputed [2] - 79:24, 86:2
unduly [1] - 11:15
uneconomical [2] - 77:13, 84:11
unfair [1] - 9:23
unfairly [1] - 11:15
unfortunately [1] - 92:22
unfounded [1] - 83:20
unit [1] - 182:24
United [1] - 34:12
units [1] - 164:20
University [4] - 28:20, 31:21, 41:12, 116:24
university [3] - 32:2, 32:8, 34:3
unless [5] - 24:3, 75:7, 124:14, 129:23, 129:24
unlikely [2] - 54:22, 55:24
unload [1] - 53:19
unloaded [1] - 123:21
unloading [1] - 26:21
unpack [1] - 147:14
unusual [1] - 128:24
up [96] - 6:15, 7:6, 10:6, 12:13, 13:19, 14:2, 16:3, 20:10, 23:23, 24:3, 26:7, 27:17, 29:1, 30:5, 30:11, 31:16, 31:19, 32:20, 34:19, 35:9, 35:15, 35:19, 38:22, 40:3, 43:3, 46:15, 47:15, 55:4, 55:22, 56:21, 59:17, 61:13, 63:18, 63:24, 64:19, 67:5, 68:5, 77:6, 78:25, 88:6, 88:7, 91:20, 92:9, 95:4, 95:5, 97:5, 98:11, 100:21, 100:25, 101:17, 104:16, 104:22, 104:24, 105:7, 105:22, 108:3, 109:6, 109:13, 109:14, 113:4, 114:12, 115:16, 115:20, 117:13, 120:14, 121:5, 121:17, 121:25, 122:21, 127:5, 130:9, 131:9, 133:5, 134:12, 135:14, 138:2, 138:25, 139:1, 142:6, 146:5, 146:9, 151:12, 154:5, 154:9, 155:22, 156:9, 162:23, 163:4, 163:6, 163:20, 164:22, 171:10, 178:13, 183:10, 183:12
upper [3] - 70:12, 74:4, 167:2
upstream [3] - 149:14, 154:17, 157:2
useful [1] - 45:22
uses [1] - 177:6
usual [1] - 128:24

V

vacuum [3] - 66:9, 66:13, 66:14
value [3] - 11:16, 56:20, 140:9
various [4] - 11:1, 40:14, 53:22, 54:3
vector [1] - 112:11
ventured [1] - 179:13
version [4] - 52:16, 52:17, 79:22, 90:7
versus [2] - 73:10, 137:9
vertical [4] - 146:23, 156:16, 168:4, 168:9
via [1] - 26:21
vial [1] - 101:16
view [3] - 11:24, 95:9, 179:2
viewed [1] - 181:1
VINCE [1] - 2:11
virgin [1] - 30:19
visibly [1] - 101:3
visit [1] - 126:13
volatile [3] - 57:1, 57:6, 62:12
volume [4] - 5:18, 46:20, 121:22, 184:9
VOLUME [2] - 1:1
volumes [2] - 7:1, 54:4
voluntarily [1] - 13:21
voluntary [1] - 14:20
vulnerable [1] - 111:3

W

wait [4] - 84:5, 144:25, 146:22
waived [1] - 94:25
walk [5] - 48:7, 51:7, 77:14, 178:22
walking [2] - 149:19, 151:2
wall [4] - 44:4, 168:4, 168:6, 168:9
wander [1] - 152:9
wants [3] - 17:8, 100:16, 144:14
wash [1] - 134:25
washing [2] - 108:4, 134:18
WASHINGTON [1] - 3:22
waste [92] - 7:16, 7:21, 7:23, 8:17, 8:18, 8:21, 20:14, 21:2, 24:4, 25:10, 26:19, 27:1, 31:17, 33:9, 35:7, 36:21, 36:23, 40:22, 42:21, 42:25, 43:8, 47:12, 48:2, 48:4, 48:20, 49:12, 49:19, 49:22, 57:3, 68:11, 68:23, 69:12, 69:13, 69:16, 72:14, 74:17, 74:22, 89:5, 89:13, 89:14, 92:1, 92:5, 92:18, 94:13, 99:1, 99:6, 100:2, 102:16, 104:7, 114:10, 114:16, 132:3, 133:14, 136:3, 138:18,

139:9, 139:19, 141:23, 142:16, 145:22, 149:2, 149:5, 149:18, 153:16, 153:21, 154:12, 157:8, 158:2, 158:3, 158:8, 159:2, 160:9, 161:13, 161:15, 162:8, 162:14, 164:6, 164:20, 165:7, 165:9, 165:14, 171:7, 177:5, 177:12, 179:10, 179:22, 181:9, 181:11
WASTE [4] - 1:10, 1:11, 3:4, 3:4
Waste [6] - 5:10, 6:5, 7:14, 8:2, 9:3, 10:2
Water [1] - 174:21
water [192] - 28:7, 30:13, 30:17, 30:21, 30:25, 31:6, 36:7, 36:8, 37:9, 37:10, 37:12, 37:15, 37:16, 38:2, 38:4, 44:5, 46:25, 47:2, 47:6, 47:13, 48:24, 49:1, 49:13, 49:14, 49:17, 49:18, 52:12, 52:15, 52:16, 52:19, 52:21, 63:7, 64:25, 65:7, 65:10, 65:15, 66:2, 66:11, 66:12, 66:15, 67:3, 67:4, 68:15, 69:3, 69:4, 69:22, 70:3, 70:4, 70:6, 71:8, 72:4, 74:22, 74:23, 75:1, 75:3, 75:5, 75:6, 75:8, 75:13, 75:14, 76:8, 76:10, 76:11, 77:13, 80:1, 80:18, 80:24, 84:8, 84:12, 84:15, 85:13, 85:24, 86:16, 87:24, 90:4, 90:10, 90:14, 90:19, 99:21, 99:23, 99:25, 100:5, 100:6, 100:13, 100:16, 100:17, 100:20, 100:25, 106:18, 106:20, 107:6, 107:9, 107:14, 107:18, 109:2, 112:11, 112:12, 112:13, 112:14, 112:15, 112:18, 113:23, 114:9, 114:17, 114:18, 114:22, 114:24, 115:10, 115:13, 115:14, 116:17, 117:1, 117:9, 117:19, 117:25, 118:5, 123:1, 124:2, 124:7, 124:12, 124:15, 124:21, 124:24, 124:25, 125:1, 125:8, 125:9, 125:11, 125:12, 126:21, 130:1, 130:11, 130:13, 144:3, 144:7, 144:13, 144:14, 144:20, 144:21, 147:1, 149:3, 149:5, 149:6, 149:11, 149:12, 149:14, 153:3, 153:5, 153:8, 153:10, 153:14, 153:20, 154:13, 155:12, 156:19, 156:23, 158:2, 158:16, 158:20, 158:22, 158:25, 159:4, 159:5, 159:10, 159:11, 159:13, 159:15, 159:16, 159:22, 161:14, 161:21, 161:23, 162:7, 162:13, 162:15, 164:19, 164:25, 165:7, 165:9, 165:16, 168:12, 168:18, 168:19
waterline [1] - 108:21
waters [6] - 86:18, 86:22, 87:5, 87:10, 114:23, 117:23
ways [6] - 31:15, 35:9, 35:25, 54:1, 95:6, 175:20
weak [1] - 126:18
weapons [1] - 35:13
weather [2] - 98:18, 120:9
week [4] - 33:13, 35:20, 49:7, 135:16
weekend [1] - 183:12
weeks [2] - 15:7, 39:19
weighed [1] - 11:18
wells [3] - 160:24, 161:3, 161:5
west [3] - 43:10, 92:11, 93:16
western [4] - 43:17, 44:15, 114:4, 161:6
wet [13] - 52:7, 52:15, 54:8, 54:9, 66:2, 67:18, 67:19, 98:18, 109:2, 109:3, 111:1, 111:2, 125:3
wetland [2] - 39:24, 129:6
wetlands [3] - 35:1, 35:2, 39:21
white [5] - 47:23, 47:25, 48:13, 105:5
whole [6] - 43:7, 88:1, 91:18, 99:24, 149:8, 165:10
wide [1] - 46:18
width [2] - 134:4, 134:21
wild [2] - 92:11, 93:16
wildlife [1] - 6:3
Wildlife [1] - 6:19
willingly [1] - 13:21
wind [1] - 114:13
WINN [1] - 3:17
WINSTON [1] - 4:5
withstood [2] - 129:20, 130:11
WITNESS [2] - 166:2, 184:17
Witness [2] - 97:24, 119:12
witness [22] - 19:5, 27:14, 27:25, 28:6, 33:8, 57:19, 58:11, 80:23, 81:4, 82:7, 83:3, 83:21, 87:20, 88:12, 88:20, 94:7, 94:20, 95:20, 170:5, 176:10, 176:17, 176:25
witnesses [2] - 15:16, 83:18
wood [1] - 69:17
word [2] - 57:5, 177:7
words [5] - 14:21, 59:24, 60:10, 149:24, 151:17
worker [1] - 53:12
worth [1] - 50:2
Wotring [46] - 5:4, 17:7, 19:25, 21:17, 23:14, 27:25, 50:10, 51:4, 53:7, 55:23, 58:8, 61:13, 61:16, 61:17, 63:13, 63:14, 63:21, 63:23, 64:1, 64:11, 68:9, 76:20, 87:23, 97:4, 102:21, 103:4, 103:20, 115:5, 119:3, 122:8, 123:19, 129:4, 129:17, 131:14, 133:3, 133:6, 136:23, 136:25, 137:12, 138:5, 138:13, 141:7, 152:19, 152:21, 157:21, 182:19
WOTRING [144] - 2:4, 2:7, 5:5, 5:20, 7:4, 7:8, 11:14, 12:20, 13:13, 17:10, 17:14, 18:5, 18:10, 18:14, 19:10, 19:16, 20:19, 20:21, 21:5, 21:22, 22:5, 22:10, 22:16, 22:20, 22:24, 23:8, 23:18, 24:7, 24:22, 24:25, 25:13, 25:24, 26:9, 27:9, 28:2, 28:10, 28:16, 29:1, 43:3, 50:24, 51:2, 55:18, 55:21, 58:11, 58:21, 60:4, 60:8, 60:14, 63:15, 63:22, 63:24, 64:10, 68:5, 76:15, 77:3, 77:6, 77:22, 78:13, 78:21, 81:15, 82:7, 82:15, 82:21, 82:25, 83:9, 84:5, 88:1, 88:5, 88:16, 89:1, 89:3, 89:6, 89:11, 89:20, 91:20, 92:14, 92:22, 93:15, 94:15, 94:19, 95:2, 96:1, 96:22, 97:5, 97:8, 102:18, 103:2, 103:15, 104:22, 105:22, 108:13, 109:7, 110:17, 111:22, 113:6, 113:11, 113:17, 115:16, 115:20, 116:8, 118:25, 120:14, 121:5, 121:25, 122:5, 127:5, 129:16, 131:9, 131:17, 132:17, 133:4, 134:11, 135:9, 136:5, 136:24, 137:11, 138:2, 138:9, 138:11, 138:25, 141:3, 141:5, 141:12, 143:15, 143:24, 146:4, 148:17, 148:23, 149:9, 150:9, 151:7, 152:6, 152:9, 152:13, 152:20, 156:3, 156:10, 157:19, 160:11, 160:15, 163:6, 165:25, 170:12, 173:5
write [3] - 38:19, 38:22, 39:4
writes [1] - 26:18
writing [1] - 184:8
wrote [1] - 128:7

Y

y'all [3] - 77:25, 95:20, 177:21
yard [5] - 46:9, 46:10, 121:10
yards [11] - 46:7, 46:8, 46:17, 46:18, 46:19, 49:25, 74:4, 74:8, 121:16, 121:19
year [4] - 32:7, 55:6, 73:1, 121:20
years [19] - 6:19, 10:11, 10:16, 16:14, 35:4, 40:5, 41:9, 50:2, 52:11, 55:10, 59:13, 62:6, 66:24, 121:21, 125:16, 157:7, 165:14
yellow [6] - 100:13, 142:2, 142:18, 143:5, 153:14
yesterday [5] - 6:18, 7:13, 13:14, 15:12, 181:1
York [1] - 34:10
you-all [12] - 10:11, 11:25, 13:8, 14:17, 16:2, 27:7, 78:9, 93:6, 93:12, 95:23, 95:24, 108:6

Z

zero [3] - 145:12, 155:20, 156:12
zoom [3] - 160:11, 160:12, 160:15