Exhibit 3

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

IN RE: ROUNDUP PRODUCTS LIABILITY LITIGATION	)
This Document Relates To:	) MDL NO. 2741
Hardeman v. Monsanto Co., et al. Case No. 3:16-cv-00525;	) Case No. 3:16-md-02741-VC
Stevick v. Monsanto Co., et al. Case No. 3:16-cv-02341; and	)
Gebeyehou v. Monsanto Co., et al. Case No. 3:16-cv-05813	)

CONFIDENTIAL

VIDEOTAPED DEPOSITION OF CHARLES BENBROOK, Ph.D.

Confidential videotaped deposition upon oral examination of CHARLES BENBROOK, Ph.D., taken at the request of the Defendants before Amy J. Brown, RMR, CRR, CLR, a Certified Court Reporter, WA CCR No. 2133, at the Quality Inn & Suites Conference Center, 700 Port Drive, Board Room, Clarkston, Washington, commencing at or about 9:03 a.m. on December 28, 2018, pursuant to the Federal Rules of Civil Procedure.

APPEARANCES

FOR THE PLAINTIFFS:
Weitz & Luxenberg, P.C.
By: JERRY KRISTAL, ESQUIRE
220 Lake Drive East
Suite 210
Cherry Hill, NJ 08002
(856) 755-1115
jkristal@weitzlux.com
Baum Hedlund Aristei Goldman, PC
By: PEDRAM ESFANDIARY, ESQUIRE
10940 Wilshire Boulevard
17th Floor
Los Angeles, CA 90024
(310) 820-6252
pesfandiary@baumhedlundlaw.com

FOR THE DEFENDANTS:
Arnold & Porter Kaye Scholer, LLP
By: ZACHARY FAYNE, ESQUIRE
Three Embarcadero Center
10th Floor
San Francisco,CA 94111
(415) 471-3114
zachary.fayne@arnoldporter.com
Hollingsworth LLP
By: GRANT HOLLINGSWORTH, ESQUIRE
1350 I Street NW
Washington, DC 20005
(202) 898-5887
ghollingsworthi@hollingsworthllp.com

ALSO PRESENT: VLADIMIR KORNEYCHUK, Videographer

T E S T I M O N Y:

E X H I B I T S:

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(Exhibit 1A marked for identification.)
VIDEOGRAPHER: We are now on the record. My name is Vladimir Korneychuk. I am a videographer for Golkow Litigation Services. Today's date is December 28th, 2018, and the time is 9:03 a.m.
This video deposition is being held in the Quality Inn in Clarkston, Washington, in the matter of In Re: Roundup Products Liability Litigation, for the United States District Court, Northern District of California. The deponent is Charles Benbrook, Ph.D.
Would counsel please identify themselves.
MR. KRISTAL: Jerry Kristal from Weitz and Luxenberg on behalf of plaintiffs.
MR. ESFANDIARY: Pedram Esfandiary for the plaintiffs.
MR. FAYNE: Zach Fayne, Arnold & Porter, for defendant Monsanto Company.
MR. HOLLINGSWORTH: Grant Hollingsworth of Hollingsworth LLP for defendant Monsanto.
VIDEOGRAPHER: The court reporter is Amy Brown. Will you please swear in the witness.
CHARLES BENBROOK, Ph.D.,
called as a witness on behalf of the Plaintiff,
who, having been first duly sworn, was then and there examined and testified as follows:

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MR. KRISTAL: Before we get started, I would state for counsel that, as I'm sure they know, based on virtually the identical report that Dr. Benbrook has written and has been served in other cases, he's been deposed five times in the last ten months. So I would just ask that you please not ask repetitive questions of things that have already been asked.
MR. FAYNE: I --
MR. KRISTAL: We don't want to get in a fight. I'm just saying at some point it really becomes an exercise more in harassment than legitimate discovery. I'm not accusing you of anything. I'm just giving you a heads-up.
MR. FAYNE: I understand your concern. I'll state that there are going to be some questions that are -- appear similar to questions asked in prior depositions.
We just want to make sure nothing has changed and confirm that in his new report, which is a new report, that he still has the opinions he's expressed in the past, and we'll do our best to avoid repetition.
MR. KRISTAL: Thank you. I appreciate that. And certainly asking if his opinions have changed are -- those are legitimate questions.
MR. FAYNE: And before we get started, we'd

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also like to state for the record that we are designating this deposition confidential pursuant to the court's con -- case management order.
MR. KRISTAL: Now, my understanding, also, just in housekeeping matters -- I don't have it with me -- was there a three-hour time limit on people that have already been deposed? Do you recall that?
MR. FAYNE: There's a three-hour time limit, I believe, for specific causation experts. The -- I believe the timeline for this deposition is the normal seven hours.
MR. KRISTAL: All right. Well, if we approach we will check what you say, and if that's correct, then seven hours it is.
MR. FAYNE: Sure.
EXAMINATION
BY MR. FAYNE:
Q. Dr. Benbrook, could you please state your name for the record.
A. Charles Benbrook.
Q. And you've been deposed many times before, correct, Dr. Benbrook?
A. Yeah, several times.
Q. So you're aware of the ground rules for depositions?

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A. I am.
MR. KRISTAL: Can we go off the record for a second?
VIDEOGRAPHER: Off the record at 8:06 a.m.
(A brief recess was had.)
VIDEOGRAPHER: Back on the record at 8:07 a.m.
Q. (BY MR. FAYNE:) So, Dr. Benbrook, I'm going to dispense with the preliminary instructions for depositions. Is that okay?
A. That's fine.
Q. And there's nothing that would prevent you from giving accurate testimony; is that correct?
A. Not that I'm aware of.
Q. And you've given several days of deposition testimony in the Roundup litigation in the past year; is that correct?
A. That's correct.
Q. Two days in the Johnson case in February 2018?
A. I believe that's the accurate date, but I don't have them memorized.
Q. Sure. I'll represent to you --
A. Okay. Fine.
Q. -- that your depositions were in February. You don't have any reason to believe that that's incorrect?
A. No.

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Q. And you had two days in the Peterson and Hall case; correct?
A. Correct.
Q. And that was May and August, respectively?
A. Yes.
Q. Also one day in the Adams case in September?
A. Correct.
Q. And you also testified in the Johnson trial in California on July 27th?
A. Correct.
Q. You gave all of that testimony under oath; correct?
A. Yes.
Q. You told the truth when you gave that testimony?
A. To the best of my ability, yes.
Q. Testified as accurately as you could?
A. To my understanding of the record that I've been asked to review, yes.
Q. And you stand by all the testimony you gave during those depositions and at trial?
A. Yes.
Q. We've marked as Exhibit 1 the deposition notice for this deposition.
(Exhibit 1 marked for identification.)

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A. Yeah.
Q. I believe you have it in front of you.
MR. KRISTAL: And just for the record, we had marked as 1A -- and I'll put it in the pile -- the plaintiff's responses and objections to the dep notice that had been served on counsel for Monsanto on December 18th. Thank you.
Q. (BY MR. FAYNE:) Have you seen this document before?
A. Yes.
Q. And if you look on page -- it starts on page 4, I believe. There are a number of requests for production. Do you see that?
A. I don't see a page 4, but I'm sure you'll direct me right to where you want to ask something about.
Q. Yeah. There are -- there are no page numbers on here, I apologize, but if you flip to it looks like the fourth page, the heading that says "Request for Production."
A. Yes.
Q. Did you check your files for responsive materials?
A. I did.
Q. And I believe you produced a handful of e-mails

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with other experts in the case; is that correct?
A. Right. I did.
Q. Other than the e-mails that you produced, have you had any other communications with the individuals listed in Request Number 18?
A. Number 18?
Q. Yes. Paragraph 18. I'm sorry.
A. Let's see. The only person that I've had any communications with was Aaron Blair, and I believe I disclosed the e-mails to him.
Q. Other than the e-mail communications, have you had any telephone conversations with Dr. Blair since your last deposition?
A. Yes, I did. I've had, I think, two.
Q. When was the first one?
A. It was -- do you have the e-mails? Because that will give me the date.
Q. I don't have them with me. I'm sorry.
A. Okay.
Q. I e-mailed Dr. Blair. The e-mail has been disclosed to you. And asked him a technical question about the glyphosate portion of the Volume 122 monograph.
MR. KRISTAL: I think the question was when was it.

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THE WITNESS: It was in November sometime. That's as close as I can recall.
Q. (BY MR. FAYNE:) And what was the subject of that conversation?
A. I asked him a question about why certain genotox studies in the glyphosate section of Volume 122 were discussed only in the narrative portions of the volume and not included in the core tables in which the majority of genotoxicity studies were presented in that report. I wasn't clear why some studies appeared only in the narrative text and others were in the tables.
Q. Did Dr. Blair have an answer for that question?
A. Yes.
Q. What was his answer?
A. That the -- his recollection was that those studies assessed genotoxic mechanisms of action that were not covered by the core tables, and in particular assays on impacts on sex hormones and oxidative stress.
Q. Did he explain why those types of assays were not covered in the core tables?
A. Just that they didn't fit. If you look at the -- the taxonomy of the way IARC did their tables, that answer made sense to me. I understood it.
Q. Do you recall how long your conversation with Dr. Blair was?

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A. 15 minutes.
Q. You testified that you had two conversations with Dr. Blair. Do you recall when the second one was?
A. Let's see. Maybe I only had one phone call with him. I sent him an e-mail and asked him if I could talk to him, and then I -- I had the phone conversation. And then I -- he expressed an interest in what I was doing, and I told him I was doing an assessment of the genotox database relied on by IARC and relied on by EPA.
And he asked me a little bit about what I was doing, and then I sent him a subsequent e-mail with just a few of the results which are actually, I think, also in my report. And there might not have been a second phone call. I can't really remember.
Q. Any in-person conversations with Dr. Blair?
A. No.
Q. And no telephone calls or in-person conversations with any of the other individuals listed in --
A. The only time I've ever met, been with any of them was Dr. Sawyers, and it was just momentarily at the trial. He testified before me. I spent a little time with him there.
Q. And for the court reporter's benefit, if you could wait until I finish my question, and I'll --

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A. Oh.
Q. -- I'll try to do the same as well. I know it's -- in typical conversation, it's hard to. And if we could try to do that.
A. Just keep reminding me.
Q. Absolutely, I will do that. And I am sure she will keep reminding me, as well.
At your first deposition in February, you testified that you spent approximately 3 -- 320 to 350 hours reviewing materials in preparation for your role as an expert witness; do you recall that?
A. I recall discussing it. I don't recall the exact hours. I'm sure I produced the invoices that had been submitted up until that time, and the number came from adding them up.
Q. In May you testified that you spent another 50 hours or so at your deposition. Does that sound about right?
A. Yeah.
Q. Do you recall roughly how much time you spent working on the Roundup-related litigation between your deposition in May and the end of August?
A. No. I'd have to look at my invoices.
Q. More than 100 hours?
A. I'd have to look at the invoices. There were

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months when I spent a lot of hours and a few months when I didn't spend a lot.
Q. In preparing your expert report for this case -- and by "this case," I'm referring to the MDL cases of Stevick, Hardeman and Gebeyehou.
MR. KRISTAL: That's as good as any of us are going to get. We'll take it.
THE WITNESS: I hope I don't have to try that one.
Q. (BY MR. FAYNE:) I'll keep working on it throughout the day. I'm going to start that question over.
In preparing your expert opinion for these cases of Stevick, Hardeman and Gebeyehou, did you rely in part on the work that you've done prior to August?
A. Yes.
Q. And that's the work you were doing in the Johnson case?
A. Yes.
Q. And the Peterson and Hall case?
A. Yes.
Q. And the Adams case?
A. Yes.
Q. So you were able to take advantage of that earlier work in preparing your expert opinion for this

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case; correct?
A. That is -- that is correct.
(Exhibit 2 marked for identification.)
Q. (BY MR. FAYNE:) In front of you, you have an exhibit that's marked as Exhibit Number 2, and these are your invoices from -- I believe it's September, October, and November of 2018; is that correct?
A. Yep. That's correct.
MR. KRISTAL: Thank you.
Q. (BY MR. FAYNE:) And so if we can quickly flip through them. It looks like you spent 19 and a half hours in September working on this case; is that correct?
A. Correct.
Q. 63 hours in October; is that correct?
A. Yes.
Q. And 82 hours in November; correct?
A. Yes.
Q. So in total you've spent over 500 hours on Roundup-related litigation. Does that sound about right?
A. Sounds about right.
Q. More than 600 hours?
A. I -- I'd have to add them up.
Q. And you're being paid $300 an hour to testify

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for the plaintiffs in these cases; is that correct?
A. Yes, sir.
Q. So over the course of the Roundup litigation, you've been paid more than $150,000. Does that sound right?
A. I -- yeah, I'm sure it's a bit more than that, yep.
Q. More than $200,000?
A. I don't think so.
Q. So you think it's somewhere between 150 and $200,000?
A. Yeah.
MR. KRISTAL: Also assumes the invoices have been paid.
Q. Have the invoices been paid?
A. Well, not all of them. Most of them.
Q. And your expectation is that the invoices will be paid; correct?
A. Yes.
Q. At your -- some of your earlier depositions, you testified that it's a very large record and you hope to have the opportunity to dig deeper into it as the case went on; is that correct?
A. That is correct.
Q. And you've now produced a new expert report for

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the Stevick, Hardeman and Gebeyehou cases; correct?
A. That is correct.
Q. In preparing that new report, have you had the opportunity to dig deeper into the record?
A. Yes.
Q. Did that include review of Bates-numbered documents -- I'll refer to them as "MONGLY documents."
A. Yes.
MR. KRISTAL: It's M-O-N-G-L-Y, all caps.
MR. FAYNE: Thank you.
MR. KRISTAL: I always notice when the court reporters wince.
Q. (BY MR. FAYNE:) How did you find the new documents that you reviewed?
A. Documents have come to me in a variety of different ways. I have had for many years extensive files of my own, particularly EPA documents. Some of those also appear in the record as MONGLY documents.
I -- as I have worked through the record, I have identified particular issues that I have felt are important for me to address thoroughly, the issues I've been asked to look at, and I -- when I feel that there's likely more in the record or when there's a reference to a document in a -- in a MONGLY e-mail and I want to see the base document or see what happened as a result of

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something, an event that's being discussed, I would ask for more documentation either before or after a particular date on a MONGLY document.
Typically I would send those requests to either Jeff Travers of The Miller Firm, or Jerry Kristal. I believe I sent a few such requests to David Wool with Andrus Wagstaff. And usually within a day or two I would get a dump of documents and I would go through those, and often the new documents would lead to additional questions for further material.
Q. The testimony that you just gave, you're referring to the course of the entire -- your entire -- your work on this entire litigation; correct?
A. Well, yes. In the -- throughout my work on the Johnson case, the person that I typically requested to do searches and send me new documents was Jeff Travers at the Miller group, but in the last six or eight months, Jerry Kristal has served that role in helping me.
Q. So I'd like to focus you on the period of time since the Johnson trial; okay?
A. That would be fine.
Q. In that period of time, have you asked Mr. Kristal for additional documents on topics relevant to this litigation?

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A. Yes.
Q. Do you recall what topics you asked for additional documents on?
A. Oh, well, at least a dozen. Most of the major areas that are covered in my report. Stewardship, the assessment of the cancer assays and genotoxicity, the sum of the incident report documents, a variety of documents involving surfactants.
I've asked multiple times for documents relating to studies done on skin penetration. And as I said, pretty much in almost all of the substantive sections of my expert report there are some new material that I accessed and reviewed and has helped inform my opinions in the current version of my report.
Q. To the extent you're relying on any of those new documents, are they cited either in your report or in your reliance list?
A. They are.
MR. KRISTAL: And to a certain extent in the reference list, as well, that was provided subsequent to the report.
MR. FAYNE: I understand, Counsel. I'd appreciate it if -- I'm asking for his testimony, not yours. But I appreciate the --
MR. KRISTAL: It was more to help you, but...

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MR. FAYNE: I understand.
MR. KRISTAL: Okay.
Q. (BY MR. FAYNE:) You also had a supplemental reference list that you produced --
A. Correct.
Q. -- in connection with this deposition; correct?
A. Yes.
Q. So they might also be listed there, as well?
A. And there might even be one or two that didn't make the list.
Q. So there might be documents that you're relying upon for your expert opinion that you have not disclosed in any of your reliance lists?
A. There might be. I'd -- it would be very hard to tell. I've looked at thousands of documents up until now.
Q. In preparing for your deposition today, did you review transcripts from your prior depositions?
A. Yes.
Q. Did you review transcripts from the Johnson trial?
A. No.
Q. Which deposition transcripts did you review, if you recall?
A. You're speaking about my depositions?

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Q. Yeah. I'm sorry. Yes. So you testified that you reviewed some of your prior deposition transcripts; correct?
A. Correct.
Q. Which ones?
A. All of them.
Q. Did you review any other deposition transcripts in preparation for today?
A. Yes.
Q. Which ones?
A. Several. Sitting here right now, I probably won't remember all of them. And in addition, sometimes when I review a deposition transcript, there's certain issues that I'm looking for, so I don't do an absolutely thorough read.
But Donna Farmer, David Saltmiras, Dan Goldstein, Dr. Sawyers -- two of Dr. Sawyers' depositions. Let's see. Who else? Acquavella, I believe I've looked at. I don't recall any others at this time, although there are probably a few others.
(Exhibit 3 marked for identification.)
Q. (BY MR. FAYNE:) I'd like to turn now to what's marked Exhibit 3 --
A. Yep.
Q. -- which is before you. And this is your

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expert report that you produced in the Hardeman, Stevick and Gebeyehou cases; correct?
A. Yes.
Q. And it's approximately 166 pages, 787 numbered paragraphs. Does that sound about right?
A. Sounds about right.
MR. FAYNE: This is not the only -- I'm sorry, Counsel. Let me give you a copy.
THE WITNESS: And I believe you've been provided the errata sheet. It was e-mailed to you -- or e-mailed to you, maybe.
MR. ESFANDIARY: Yes. I sent it to you last night. Sent them to --
THE WITNESS: Just typos, errata sheet.
MR. FAYNE: I have not received that, but we can talk about that off the record.
THE WITNESS: Okay. We'll get it to you.
MR. KRISTAL: I may have a copy, actually. This had been e-mailed to I'm not sure which counsel last night.
MR. ESFANDIARY: E-mailed to Pamela Yates and Julia DuPont, I believe, at Arnold Porter.
MR. FAYNE: Yes. Thank you.
Q. (BY MR. FAYNE:) So Exhibit 3 is your expert report in these cases; correct?

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A. Yes.
Q. And when I refer to "these cases," you'll understand that I mean the Hardeman, Stevick and Gebeyehou cases?
A. Yes, sir.
Q. If I'm not referring to those specific cases, I'll be sure to say so during the deposition; is that okay?
A. Yep.
Q. This is not the only report that you've produced in the Roundup litigation; correct?
A. Yes.
Q. You also produced a report in the Johnson case; correct?
A. That is correct.
Q. Have you produced any other expert reports in the Roundup-related litigation?
A. No.
Q. Who wrote the first draft of this report?
A. I did.
Q. Did the attorneys provide comments on your draft?
MR. KRISTAL: Objection. Privileged.
THE WITNESS: No.
MR. KRISTAL: You don't have to answer those

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questions.
THE WITNESS: Oh, okay.
MR. KRISTAL: I'll instruct you not to -- I'll instruct you next time.
Q. (BY MR. FAYNE:) Your expert report in these cases covers topics that are similar to those addressed in Johnson; correct?
A. Yes.
Q. And as we discussed previously, the work that you did in the Johnson case was useful as you prepared this expert report; correct?
A. Of course it was.
Q. And you were able to reuse certain sections?
A. Yes.
Q. Presumably that meant that you were able to draft this expert report in less time than your Johnson report; correct?
A. It was --
THE WITNESS: Did you want to say something?
MR. KRISTAL: No. No. No.
THE WITNESS: It was somewhat less work, but I -- between the filing of my Johnson report and the completion of this one, just off the top of my head, I would say I probably have spent a roughly comparable amount of time delving deeper into the record.

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So while not all of this report is new, all of the sections are, I think, substantially refined, and I -- I feel that I've been able to document and support my reviews of these matters of my opinions in a more thorough and effective way in the current version of the report, and that took a lot of time.
Q. (BY MR. FAYNE:) In other words, you were able to build off your Johnson report; is that a fair characterization?
A. Build off and also extend in some significant ways, yes.
Q. Does this report contain all of the expert opinions that you intend to offer in this -- in these cases?
A. As I've done it in every case that I've been involved with, I will try to respond to any questions placed to me as thoroughly as I can. This report codifies opinions that I've reached based on my review of the record to date, and it is what I will testify to at trial, but I don't know what I'll be asked.
Q. Understood. But if you intended to testify about additional topics, you understand that you would have to amend your report; is that fair?
A. Yes, I understand that, sir.
Q. You were designated as an expert witness in the

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Stevick, Hardeman and Gebeyehou cases; correct?
A. Yes.
Q. Have you ever met Mr. and Mrs. Stevick?
A. No, I have not.
Q. Have you ever met Mr. Hardeman?
A. No.
Q. What about Mr. Gebeyehou?
A. No.
Q. Ever spoken to any of them?
A. No.
Q. Have you reviewed the legal complaints that they filed in these lawsuits?
A. Perhaps scanned them. I don't recall if I reviewed it in any detail.
Q. So fair to say that you're not relying upon them in issuing your expert opinion?
A. No, I'm not.
Q. Have you ever reviewed the transcripts of their depositions?
A. No.
Q. What about their responses to discovery requests?
A. No.
Q. Your report did not include any opinions that are specific to Mr. and Mrs. Stevick; correct?

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A. That is correct.
Q. Same for Mr. Hardeman?
A. Yes.
Q. Same for Mr. Gebeyehou?
A. Yes.
Q. Is it fair to say that you do not intend to offer testimony that is specific to any one of those plaintiffs?
A. That is correct.
Q. Also fair to say that you're not basing your expert opinions on any facts that are unique to any of their individual cases; correct?
A. That is also correct.
Q. I would like to turn to Exhibit 4. Actually, before we get to Exhibit 4, if you could turn to your reliance list in your expert report.
A. Okay. Okay.
Q. So your reliance list includes four categories of documents; correct?
A. Yes.
Q. And that's documents with a Bates number, published scientific studies and technical documents, depositions, deposition exhibits, Johnson trial documents and genotoxicity documents; correct?
A. Correct.

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Q. I also understand that you're relying on a few documents that are cited in your report that might not be on this reliance list; is that correct?
A. That's -- that's likely true.
Q. And to the extent you're relying on those documents, they're cited in the report; correct?
A. Correct.
Q. Are you relying on any documents that were cited in the prior version of your report that are not cited in this report?
A. Oh, geez. It -- possibly.
Q. You can't say one way or the other sitting here today?
A. Well, I know that in the interest of trying to shorten the report and especially in light of the added material, there are -- there is some substantial passages from the Johnson expert report that are not in this report.
And there may have been some MONGLY documents cited in the Johnson report, but I would still -- because I read them and they helped inform my opinions, they still form the basis of the opinions in the current report even though they're not cited.
Q. Do you know whether those documents are cited in your reliance list or updated reliance list?

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A. Probably are. I've tried to be cumulative with it.
Q. And over the past 30 years, I understand that you've also reviewed a number of documents that have informed your general thinking on pesticides and glyphosate; is that correct?
A. More than 30 years, yes.
Q. I think I took that number from your report, but I apologize if I got that wrong.
So now if we could turn to Exhibit 4, which is your supplemental reliance list.
(Exhibit 4 marked for identification.)
A. Okay. Back to this one.
Q. Yep. And this -- I apologize. I referred to it as supplemental. It's your updated reference list; correct?
A. Yes.
Q. And this lists additional Bates-numbered documents that you've relied upon in forming your opinions; correct?
A. And one journal article.
Q. And one journal article, correct.
Is it fair to say that all of the documents that you're relying upon to support your opinion are cited either in your report, on your reliance list, or

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on your updated reference list?
A. Yes. And it would include the documents presented as exhibits during my trial testimony and various exhibits in my depositions and the depositions of other parties to the -- to the case that I've read.
Q. Could you turn to page 8 of your reliance list?
A. This is back in the report?
Q. Back in the report, yes. So this is Exhibit 3, page 8 of the reliance list.
A. Yeah. Yeah. Yeah. Got it.
MR. KRISTAL: Did I steal yours? I apologize.
MR. FAYNE: No problem. This one seems to be working.
Q. (BY MR. FAYNE:) So you'll see towards the bottom of this list, there are a number of documents listed as public document; correct?
A. Correct.
Q. And that goes on to page 9, as well?
A. Correct.
Q. Would you agree that it would be difficult for someone looking at this list to identify which documents you're referring to?
A. It would be indeed. My apologies.
Q. Are you able to identify which documents these are referring to?

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A. I know I can describe them in general. Would that be helpful?
Q. I don't need you to do that sitting here today, but you'd be able to update this list so that it would be easier for someone to understand what you're referring to; correct?
A. I'll endeavor to do that, yes.
Q. Thank you. Appreciate that.
THE WITNESS: Can you help me remember to do that?
MR. KRISTAL: Uh-huh.
(Exhibit 5 marked for identification.)
Q. (BY MR. FAYNE:) And then the last exhibit we had pre-marked is just Exhibit 5, which is your updated résumé.
A. Okay.
MR. KRISTAL: Thank you.
Q. And the only question I have for you about this right now is that this is your current résumé; is that correct?
A. No. Oh, yes. Yes, it is. I'm sorry. I had to check the last change, and the last change is in there.
Q. Thank you.
A. Glad we got beyond the résumé part of this.

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Q. We're not quite done yet.
MR. KRISTAL: See? You spoke too soon.
Q. So I'd like to ask you some questions now about your credentials. I understand that some of these have been asked in the past, but I just want to confirm that nothing has changed. I'll try to get through this section as quickly as possible.
A. Thank you.
Q. I understand counsel's concern.
You've never been employed by the Environmental Protection Agency; correct?
MR. KRISTAL: Don't answer that question.
If you want to ask since the last deposition when he was asked that exact question whether he's been employed, that's a good question. Otherwise we're not going to go through every single thing that's been already asked.
MR. FAYNE: Are you --
MR. KRISTAL: Yes, I'm instructing him not to answer that. But I'm not -- I think it would be proper for you to ask him since the last time he's answered that question. That's fair.
Q. (BY MR. FAYNE:) You've never been employed by the FDA; correct?
A. Same.

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MR. KRISTAL: Same objection. And it's the same request. You can get the information you need if you want it. Just ask him since the last time.
MR. FAYNE: So just for the record, you're instructing the witness not to answer?
MR. KRISTAL: Yes, because it's harassment at this point. He's answered those questions. You know that he hasn't been employed by EPA or FDA certainly up to the date of the last time he was asked that, which is within the last couple of months. So if you want to ask since then, that's fair. Otherwise, it is harassment.
Q. (BY MR. FAYNE:) Since your last deposition, I assume you've not received any training in medicine; correct?
A. Correct.
Q. Since your last deposition, you've not received any formal training or degree in any physical science; correct?
A. No.
Q. And you are not being designated as an expert in this case in any physical science; is that correct?
A. No.
Q. Since your last deposition, you haven't received any formal training or degree in toxicology; correct?

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A. No.
Q. And you are not a toxicologist; correct?
A. I'm not a practicing toxicologist. I am an expert in the role of toxicology data in the assessment of pesticide risk and the types of studies that are done, the way that they are translated into quantitative estimates of risk and the role that they play in pesticide regulation. So from -- for that aspect of the field of toxicology, I am an expert.
Q. How did you become an expert in that aspect of toxicology?
A. Through research.
Q. Reviewing public literature?
A. Public literature, some -- some studies done by registrants, interactions with scientists, and engagement with the issues and other scientists over the last four decades.
Q. Have you ever designed a toxicology study?
A. No.
Q. Have you ever conducted a toxicology study?
A. No.
Q. You're not an epidemiologist; correct?
MR. KRISTAL: Not since the last time he's been asked that question.
A. Sir, if I had training in a field of that

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nature, it would be on my résumé.
Q. So since your last deposition, you have not received any formal training or degree in epidemiology; correct?
A. As you will note, there's been no update in my résumé that indicates that I've had such training.
Q. So you've received no formal training or degree in epidemiology?
A. Correct.
Q. Since your last deposition, you've not received any formal training or degree in pathology; correct?
A. Correct.
Q. You're not a pathologist?
A. I am not a pathologist.
Q. Do you have any formal training or degree in exposure assessment?
A. No.
Q. You do not claim to be an expert in exposure assessment; correct?
A. Other than the role that exposure assessment methodologies play in the pesticide risk assessment process, the data that's generated by registrants in compliance with data requirements on the exposure side.
I've done extensive research on the biomonitoring data that's in the public literature. I

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understand the tools and the methods. I am -- have a deep background in the evolution of analytical chemistry methods used to quantify the levels of pesticides in a variety of matrices and regard myself as an expert in the general tools and methods utilized to estimate exposure -- exposures to pesticides, including an herbicide like glyphosate.

Q. Have you ever been qualified as an expert in any other litigation on exposure assessment?

A. I've been qualified as an expert in cases where exposure assessment was one of the issues that was entailed in the case, but I wasn't specifically designated as a -- as an expert in exposure assessment, as least I don't remember ever being.

Q. Do you have any formal degree or training in ADME, which, as you know, stands for absorption, distribution, metabolism and excretion?

A. I'm not aware of any formal degrees in that particular field, but -- and no, I have none.

Q. And you don't claim to be an expert in ADME; correct?

A. Again, I do have extensive expertise in the importance of studies falling within that area of pesticide risk assessment and feel quite capable of understanding the record in this case that relates to

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the behavior of glyphosate herbicide and formulated herbicides in plant matrices, human skin, et cetera, and the environment.

Q. Since your last deposition, you haven't received any formal training in -- or degree in corporate ethics; correct?

A. Correct.

Q. What about law?

A. No, I haven't gone through law school in the last four months.

Q. It would be pretty impressive if you had.

Have you ever conducted a scientific exposure assessment?

A. No.

Q. Have you ever designed an assessment of exposure?

A. I -- I've participated and am -- and continue in some of my work to develop the methodologies to estimate exposure to pesticides. Yes, I -- I do.

Q. In what context?

A. Primarily in a dietary exposure from residues in food. I've developed proprietary models that quantify dietary exposures as a result of residues in food. That's been a -- that's been a major focus of my work for over 20 years.

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Q. Other than dietary exposures, have you designed risk assessment for any other types of exposures?

A. I haven't designed an exposure assessment study, but I've certainly reviewed and worked with several of them and several exposure assessments in EPA regulatory documents which has given me a firm grounding in the way that the agency approaches exposure assessment.

Q. So you have never designed a dermal exposure study, for instance?

A. Correct.

Q. What about a dermal penetration study, in case you view those as different?

A. Same answer.

Q. I'd like to turn now to your expert report which we've marked as Exhibit 3.

A. Okay.

Q. Would you turn to page 21? I'm sorry, page 20 of your expert report.

A. Okay.

Q. And in this section you've conducted an analysis of genotoxicity studies relied on by EPA as compared to those relied on by IARC; is that a fair characterization?

A. Yes.

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Q. For your comparison you used EPA's September 2016 report titled "Glyphosate Issue Paper: Evaluation of Carcinogenic Potential"; is that correct?

A. Yes.

Q. You're aware that EPA has published an updated version of that issue paper in December 2017; correct?

A. Yes, I am.

Q. Why did you use the 2016 report instead of the 2017 report?

A. It's the one that I had done the vast majority of my analysis with, and I check to -- to -- when the new -- newer report came out, I didn't recognize very many changes, and so I just continued to work with -- with that one.

It also, given that my -- the focus is a comparison of the genotox database that EPA used and referred to in their September 2016 report to the IARC report which came out a few months -- the full Volume 122 monograph that came out roughly at the same time.

So I was -- I felt it was most appropriate analytically to focus on what those reports said at the time that they were issued.

Q. Did you check to see whether EPA cited any new or additional genotoxicity studies in their 2017 report?

A. I think they did a few new ones, yes.

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Q. That wasn't important to your analysis?
A. No. I didn't see enough differences to redo the whole analysis.
MR. FAYNE: I'll mark as Exhibit 6 EPA's 2016 OPP report.
(Exhibit 6 marked for identification.)
MR. KRISTAL: Was this 6, did you say?
MR. FAYNE: 6.
Q. (BY MR. FAYNE:) Is this the EPA report that you used for your analysis?
A. I can't tell if it's the original or the updated one, but you'll tell me, I'm sure.
Q. If you look at the front cover, it says "September 12th, 2016."
A. Yeah.
Q. And that's the version that you used; correct?
A. Yes, that's the version I used.
Q. And in your analysis, you were comparing the studies that EPA considered in its genotoxicity assessment in this 2016 report to those considered by IARC in Volume 112 of its monographs; correct?
A. Correct.
Q. So let's mark Volume 112 as well just so we have them both in front of us.
MR. FAYNE: So we'll mark Volume 112 of IARC's

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monographs as Exhibit 7.
(Exhibit 7 marked for identification.)
MR. KRISTAL: Always nice to unburden yourself, when you're taking a deposition, of all the documents.
MR. FAYNE: You have no idea.
MR. KRISTAL: I do have an idea.
Q. (BY MR. FAYNE:) In comparing the studies that EPA -- let me start over. Strike that.
In comparing the genotoxicity studies that EPA reviewed as compared to those reviewed by IARC, what were you trying to show?
A. I was simply trying to understand the genotox database that formed the foundation of EPA's judgment on genotoxicity, and I also tried to understand the genotoxicity database that IARC relied on in reaching their different judgment, and then I compared the two to see that -- whether the differences in the studies that EPA reviewed and relied upon were different enough to explain why EPA reached a diametrically opposed conclusion on the question of genotoxicity compared to the conclusion reached by IARC.
Q. Were you trying to show that IARC's review of the genotoxicity database was more comprehensive?
A. It was obvious that it was more comprehensive in several ways. It's -- it's -- it has been clear to

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me for -- since I began working on this case that the difference in judgment reached by EPA on the oncogenicity of glyphosate and glyphosate-based herbicides relative to the judgment reached by IARC is a central controversy in the case.
And I -- I wanted to try to understand from a scientific point of view what might have led the EPA to reach a different conclusion than IARC, and I designed my analysis to try to understand what those differences were.
Q. You testified that it was obvious to you that IARC's review was more comprehensive in several ways. What were those ways?
A. They relied -- the IARC working group relied much more heavily on studies on formulated glyphosate-based herbicides, whereas the EPA's analysis did not place really hardly any weight on those. And also, the IARC working group relied much more extensively on public literature studies appearing in peer-reviewed journals.
Q. Any other ways in which the IARC review was more comprehensive, in your opinion?
A. I think the -- the IARC report is actually a bit more thorough in discussing the strengths and weaknesses of individual studies compared to the EPA

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report, but it may -- it just may be that the EPA, in compiling that report, they didn't put in all of the details in their individual reviews of each of the studies.
I'm quite sure that there's a probably an EPA memo in the files of HED, Hazard Evaluation Division, on all the genotox studies from registrants that they reviewed, and that would be a 4,000-page document instead of a 260-page document had they done that.
But that -- that is one -- I thought the qualitative assessment of the -- of the studies was more thorough in the IARC review compared to the EPA document.
Q. But you're not testifying that IARC's review was necessarily more thorough, just that its write-up was more thorough. Is that a fair characterization?
A. No, that's not a fair characterization.
Q. But you testified that you're sure that the health effects division has a memo in its files that's much longer. So you have no way of knowing one way or another how thorough the review is; correct?
A. I based my assessment -- my comparative assessment on these two reports that are presented by EPA on the one hand and IARC as the culmination of their systematic and quite extensive reviews of the studies

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and the public literature that were available to them and fell within the guidelines for what they relied on.

Q. Let's turn to Appendix C of your report, which I believe lays out your methodology; correct?

A. Okay.

Q. And, sorry, I should be more clear. Appendix C of your expert report, which we had marked as Exhibit 3.

A. Yeah. Okay. I'm there.

Q. So this appendix lays out the methodology used to compare the IARC report to the EPA report; correct?

A. Yes.

Q. Just to make sure I understand exactly what you did, you're counting the number of studies cited by IARC and then counting how many of those studies were considered by EPA; correct?

A. It's not exactly studies. It's counting the number of assays included in the core tables produced by EPA in their report, and then I did essentially the same analysis of the core tables produced by the IARC working group.

Several studies report assay results on -- in more than one cell line. Some studies report assay results on technical glyphosate and formulated glyphosate-based herbicides. A few include data on AMPA.

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So the total number of assay results that appear in both the EPA core tables and the IARC core tables exceed the number of studies cited.

Q. So just to confirm that I understand what you just laid out, you're counting the number of assays, not the number of studies; correct?

A. I'm counting the number of assay -- individual assay results that the EPA felt appropriate to include in their core tables based on their review of the studies.

And if you read the EPA report, they say that they identified and include in their core tables the primary results of the study, often as highlighted by the authors of the study, whether it's a peer-reviewed study in the literature or a registrant-submitted study.

Q. So you're counting the number of assay results the EPA put in its core tables and comparing that to the number of assay results that IARC put in its core tables; correct?

A. Correct.

Q. To determine how many studies -- or strike that.

To determine how many assay results were considered by EPA, you used Tables 5.1 through 5.7 in the EPA report; correct?

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A. Correct.

Q. You didn't refer to any other information in the report, correct, for purposes of this analysis?

A. Well, in terms of counting the number of assays in the core tables, yeah, I just used the core tables.

Q. And as you just testified, the only input you used for your analysis was the core tables; correct?

A. Well, I do address in my analysis the appendix tables where EPA listed a number of assays on formulated glyphosate-based herbicides, but they also say quite clearly that they -- they didn't place any weight or much weight on them in their analysis.

Q. Could you show me in your analysis where you identified the appendix tables that EPA referred to on formulated products?

A. It's probably in my report somewhere.

Q. We can -- you can look for it at a break. I'll represent to you --

MR. KRISTAL: He's not going to look for it at a break. If you want him to do it now, a break is for a break. But he's happy to look for it now, if you'd like.

THE WITNESS: As you know, I've gone to --

MR. KRISTAL: Is that what you want him to do?

MR. FAYNE: No. That's all right.

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MR. KRISTAL: Okay.

Q. (BY MR. FAYNE:) Tables 5.1 through 5.7 in the EPA report address studies on glyphosate technical; correct?

A. Correct.

Q. Or pure glyphosate?

A. Probably more appropriate to say glyphosate technical.

Q. Sure.

A. Because there's no such thing as pure 100 percent glyphosate.

Q. Sure. So we'll refer to it as glyphosate technical.

A. Yeah. I think that's appropriate.

Q. And to determine how many studies were considered by IARC, you used Tables 4.1 through 4.6 in the monographs; correct?

A. Correct.

Q. And those tables address studies on glyphosate technical, glyphosate-based formulations, and studies on the glyphosate metabolite AMPA; correct?

A. Correct.

Q. So you're comparing the number of genotoxicity studies on glyphosate technical that EPA considered to the number of studies on glyphosate technical,

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glyphosate-based formulations and AMPA that IARC considered --
A. Correct.
Q. -- is that fair?
Can you turn to page 21 of your report, paragraph 63?
A. Back to there, okay. You said page 21?
Q. Yes, paragraph 63.
A. Got it.
Q. You state, "Of the approximate 120 genotoxicity studies in all categories cited by IARC, EPA cited about 50 in its 2016 report or about 42 percent of those considered by IARC."
Did I read that correctly?
A. Yes.
Q. When you say "in all categories cited by IARC," you're referring to glyphosate technical, glyphosate-based formulations, and AMPA; correct?
A. Correct.
Q. Only 55 of those 120 genotoxicity studies cited by IARC fell into mammalian categories; correct?
A. Yeah. That's in a subsequent paragraph, I assume.
Q. Yep.
A. Yes, sir.

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Q. Yes. That's paragraph 64 where you state that "Of the 120 studies" --
A. Right.
Q. -- "reviewed by IARC, 55 fell in mammalian test categories"?
MR. KRISTAL: I think that little squiggly line means approximately.
THE WITNESS: That's correct.
Q. (BY MR. FAYNE:) Approximately 55; correct?
A. Yes.
Q. You agree that mammalian test categories are the most relevant to the assessment of glyphosate's potential to trigger carcinogenic risk in humans; correct?
A. Yes, I do.
Q. And actually, if you'll turn to page 98 of the EPA report. And I apologize. I know I'm asking you to use two different documents here.
A. That's all right. I know right where you're going.
MR. KRISTAL: Need to ask him about his expertise in mind reading.
THE WITNESS: Okay. 98.
Q. (BY MR. FAYNE:) So page 98, in the bottom of that second full paragraph, it states that "Studies

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conducted in non-mammalian species (example, worms, fish, reptiles, plants) were excluded because they were considered to be not relevant for informing genotoxic risk in humans."
Do you see that?
A. Actually, I don't. You're talking -- page 98?
Q. Yes, of the OPP report.
MR. KRISTAL: Can you just give us which paragraph?
MR. FAYNE: It's the bottom of the second full paragraph.
THE WITNESS: Oh, okay. I was in the bottom paragraph. I'm sorry.
Q. (BY MR. FAYNE:) So I'll read that again. It says, "Studies conducted in non-mammalian species (example, worms, fish, reptiles, plants) were excluded because they were considered to be not relevant for informing genotoxic risk in humans."
Do you see that?
A. Yes, I do.
Q. And did I read that correctly?
A. You did.
Q. So EPA excluded studies from its analysis that were on non-mammalian species; correct?
A. That is correct.

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Q. And that's because it concluded that those studies were not relevant to genotoxic risk in humans; correct?
A. That was the conclusion reached by EPA, yes.
Q. Do you disagree with that assessment?
A. Yes, I do disagree and so does IARC. And many other scientists in that genotoxicity assays done in non-mammalian species lend further insights into the biological properties and impacts of various chemicals under review.
I think it's -- there is -- it is widely accepted that the most relevant studies are done in mammalian systems, but the IARC working group clearly felt that the non-mammalian studies were -- added additional insights and value to the data set.
Q. But you agree that it's widely accepted that the most relevant studies are the ones that are done in mammalian test systems; correct?
A. Yes, I do agree with that.
Q. You state that "Of the approximately 55 studies conducted in mammalian systems that were reviewed by IARC, EPA considered about 40"; correct?
A. Correct.
Q. And again, in making this determination, you were looking at Tables 5.1 through 5.7 of the EPA

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report; correct?
A. Correct.
Q. So if you'll turn to page -- you're probably already there -- page 98 of the EPA report.
A. Back to where we were, okay.
Q. Yes. And now we're looking in the first full paragraph on that page.
A. All right.
Q. It says, "In the current analysis, a fit for purpose systematic review process was conducted to identify relevant genotoxicity data from regulatory studies and published literature, from open sources (published and unpublished) for both glyphosate technical and glyphosate-based formulations. Studies conducted with glyphosate formulations that were identified and considered relevant for genotoxicity evaluation are summarized in table form in Appendix F."
Do you see that?
A. Yes.
Q. And then if we turn to Appendix F, which is on page 214.
A. Yes.
Q. So in Appendix F, there are a number of tables; correct?
A. Correct.

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Q. And these list studies on the formulated -- genotoxicity studies on the formulated product that EPA cited in the tables; correct?
A. That they included in the table, correct. In the tables.
Q. In the tables, correct.
And I haven't counted the studies, but there are more than 25 or so studies cited in these tables; correct?
A. Yes.
Q. In reaching your conclusion that EPA considered only 40 of the approximately 55 studies considered by IARC, you did not include studies that were cited in these tables in Appendix F; correct?
A. That's correct.
Q. Had you included those studies, the number considered by EPA would have been larger than 40; correct?
A. It would have been inappropriate to do so because if you continue reading in the same paragraph, that -- that appears on the top of page 98, you finished with "Studies" -- this is the last sentence that you read -- "Studies conducted with glyphosate formulations that were identified and considered relevant for genotoxicity evaluation are summarized in table form in

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Appendix F. As described in Section 7.0 of this document, glyphosate formulations are hypothesized to be more toxic than glyphosate alone. The agency is collaborating with NTP to systematically investigate the mechanisms of toxicity of glyphosate and glyphosate formulations. However, the focus of this section is the genotoxic potential of glyphosate technical."
So in this passage, the EPA is fairly clearly saying that they did not place much, if any, weight on the genotoxicity studies on the formulated products, so I felt it would be inappropriate for me to include them as among the studies that EPA considered in its evaluation since they say right here that they didn't consider them.
MR. FAYNE: I'll move to strike that answer as non-responsive.
MR. ESFANDIARY: The answer will stand.
Q. (BY MR. FAYNE:) The question was, had you included --
THE REPORTER: Could you repeat?
MR. ESFANDIARY: I said the answer will stand.
Q. (BY MR. FAYNE:) The question was, had you included these studies in the analysis, the number of studies considered by EPA as compared to IARC would have been higher; correct?

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A. If I had done that, yeah, it would have gone up.
MR. KRISTAL: Are you at a somewhat clear breaking point? We've been going a little over an hour. I'd like to take a break. If you have a question or two, that's okay.
MR. FAYNE: Sure. We can take a break.
MR. KRISTAL: Okay.
VIDEOGRAPHER: Off the record at 9:08 a.m.
(A brief recess was had.)
VIDEOGRAPHER: Back on the record at 9:27 a.m.
Q. (BY MR. FAYNE:) Dr. Benbrook, we've been discussing your analysis of the EPA review of genotoxicity studies as compared to IARC; correct?
A. Yes.
Q. And we had just been talking about the tables in Appendix F of the EPA report; correct?
A. Yes.
Q. I'd like to turn your attention now to Appendix D of the EPA report, and that's on page 196.
A. Yes.
Q. Appendix D of the EPA report is a list of studies assigned a low quality ranking and not evaluated in detail; correct?
A. That's what it says, yes.

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Q. In reaching your conclusion that EPA considered only 40 of the approximately 55 studies cited reviewed by IARC, you did not include the studies cited by EPA in Appendix D; correct?
A. No, I did not, because the EPA said that they didn't consider them to be of adequate scientific quality.
Q. Would you agree that these are studies that EPA considered but then assessed as low quality?
A. I think the EPA considered that they were low quality, and so they didn't factor in the results of the studies one way or the other.
Q. But you agree that EPA would have had to review and evaluate the studies to determine that they were of low quality; correct?
A. They would have had to do that, correct.
Q. And you testified previously that you're sure that there's other documents in the record, you know, a 4,000-page memorandum that might discuss in more detail EPA's underlying reasoning for its review; correct?
A. Of the different genotoxicity studies?
Q. Correct.
A. Yes.
Q. And so in that document or that type of document is where EPA might have set forth its analysis

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as to why these studies were low quality; correct?
A. One would presume that they would do that, but I would need to look at them to see, you know, what precise reason they cited in each one of them.
Q. You do not know one way or the other whether there's a document in the EPA record in which they lay out in detail their review of these studies listed in Appendix D; correct?
A. I made no attempt to find such documents.
Q. So now let's turn to paragraph 65 of your report, which is on page 65. I apologize. It's on page 22. I thought that couldn't be right.
A. Okay. Paragraph 65.
Q. Paragraph 65, correct.
MR. KRISTAL: I was going to say those are some long paragraphs.
MR. FAYNE: Yeah.
Q. (BY MR. FAYNE:) You state that of the five studies on, quote/unquote, exposed humans reviewed by the IARC Working Group, three were regarded as positive. These studies were given little or no weight by EPA because they entailed exposures to formulated GBHs -- which stands for glyphosate-based herbicides -- not technical glyphosate, the focus of EPA's review.
Did I read that correctly?

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A. Yes, you did.
Q. And I'm correct that "GBHs" refers to glyphosate-based herbicides; correct?
A. Yes, you are.
Q. So turning to the IARC monograph, page 47.
A. Did you say page 47?
Q. Page 47, yes, Table 4.1.
A. Okay. I have it.
Q. Are these the five studies in exposed humans that you're referring to in paragraph 65 of your report?
A. They are.
Q. And if you look at the list, it shows an assay result from Paz-y-Mino, et al.?
A. Correct.
Q. That's P-A-Z dash Y dash M-I-N-O, et al., 2007. Assay result from Paz-y-Mino, et al., from 2011?
A. Correct.
Q. An assay result from Bolognesi et al., 2009?
A. Correct.
Q. And two more assay results from Bolognesi, et al., 2009; correct?
A. Correct.
Q. If you could look back to Appendix D of the EPA report now.
MR. KRISTAL: What page was that?

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MR. FAYNE: That was page 196.
Q. (BY MR. FAYNE:) And again, Appendix D is the list of studies that EPA assigned a low quality ranking to.
A. Okay.
Q. Do you see here that EPA listed in Appendix D the Bolognesi, et al., 2009, the Paz-y-Mino, et al., 2007, and the Paz-y-Mino, et al., 2011? Correct?
A. I do see that, yep.
Q. So EPA considered these five studies to be of low quality; correct?
A. That's what they say in Appendix D.
Q. In other words, EPA considered these studies but then did not assess them in detail because in EPA's view, they were low quality studies; correct?
MR. KRISTAL: Objection.
A. That's essentially correct, yes.
Q. So now let's look at paragraph 9(a) of your report which is on page 7.
A. 9(a)?
Q. Yes. Of your report. You'll see on page 7 you have a paragraph 9 -- I'm sorry.
A. All right. The (a) got me confused. All right. So paragraph 9(a) on page 7. Okay.
Q. So you state here that "IARC placed heavy

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weight on three studies of human populations exposed to glyphosate-based herbicides that displayed, according to the IARC Working Group, strong evidence of direct damage to human DNA."

Do you see that?

A. Correct.

Q. Are you referring to those same three or five studies, however you want to characterize it? The Bolognesi 2009, Paz-y-Mino 2007, and Paz-y-Mino 2011?

A. I'm actually referring to the narrative section in the summary report -- the summary report section of the IARC report where they present their overall analysis of the -- of the -- of the genotox -- or their decision to classify glyphosate or glyphosate-based herbicides as probable human carcinogens.

And in its Section 6 of the IARC report that begins on page 78 of IARC Monograph 112, in the Section 6.4 on the rationale, the first bulleted item, "There is strong evidence that exposure to glyphosate or glyphosate-based formulations is genotoxic based on studies in humans in vitro and studies in experimental animals." And then they go on to say, "One study in several communities in individuals exposed to glyphosate-based formulations also found chromosomal damage in blood cells. In this study, markers of

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chromosomal damage (micronucleus formation) were significantly greater after exposure than before exposure to the same individuals."

This is where the IARC Working Group highlights the studies on DNA damage in exposed human populations. It's not -- it's not -- I'm not able to definitively say which of those -- those positive studies they're referring to, but it's certainly one of them.

And because of their highlighting this aspect of the data set in their summary statement, it -- it was -- it was clear to me that they both regarded the studies as adequately conducted and the findings as important.

Q. Perhaps you didn't understand my question. I'm just trying to understand what are the three studies that you say IARC placed heavy weight on?

A. The three positive studies and the direct damage to DNA table --

Q. And are those --

A. -- that we were just talking about.

Q. So the Bolognesi 2009, the Paz-y-Mino 2007 --

A. Correct.

Q. -- and the Paz-y-Mino 2011?

A. Right.

Q. And as we discussed previously, you agree that

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EPA placed little weight on these studies because it assessed them to be of low quality; correct?

A. No. I think -- well, I think they -- in addition to them placing them in Appendix D, they say quite clearly in the report that their assessment of the genotoxicity of glyphosate is based on studies on glyphosate technical and they did not review or place weight on the studies on formulated product, whether they were high quality or low quality.

Q. But one reason that they excluded these studies from their analysis is because they assessed them to be low quality; correct?

MR. KRISTAL: Objection.

A. As I -- as I said, you know, they -- they state clearly in their report that their focus was on studies on glyphosate technical, so this certainly suggests to me that their assessment of the studies on -- on formulated glyphosate-based herbicides was not as thorough and certainly there was not as much weight placed on them.

Q. You mentioned previously an NTP review that was -- that EPA was going to partner with NTP to evaluate studies on glyphosate-based formulation; correct?

A. It's not exactly partner. It's the -- I think

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the EPA has requested that the NTP conduct a set of genotox assays on technical glyphosate and glyphosate-based herbicides to further inform the differential toxicity between glyphosate technical and formulated glyphosate-based herbicides.

Q. If you turn to page 141 of the EPA report.

A. Okay.

Q. The Section 7.0 is labeled "Collaborative Research Plan for Glyphosate and Glyphosate Formulations"; correct?

A. Correct.

Q. And it states in the second paragraph that "The agency has been collaborating with the NTP division of the National Institute of Environmental Health Sciences to develop a research plan"; correct?

A. Correct.

Q. So EPA is working collaboratively with the NTP division to develop a research plan; correct?

A. To develop the research plan, but NTP is doing -- has done the studies.

Q. And then if you turn to page 142.

MR. KRISTAL: Of?

MR. FAYNE: Of the EPA report. I'm sorry.

MR. KRISTAL: Thank you.

THE WITNESS: Next page, in other words.

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Q. (BY MR. FAYNE:) Yes, the next page under the graphic. The last sentence of that paragraph states that "However, when members of an NTP work group looked at the available data included in the IARC review, the group did not agree with IARC, but the data provided strong or clear evidence for either genotoxicity or induction of oxidative stress given protocol deficiencies that could produce questionable results."

Did you see that?

A. Yes. You read that correctly.

Q. So you agreed that the NTP work group, at least based on this preliminary review, did not agree with IARC on the studies of -- genotoxicity studies of formulated product; correct?

A. This is -- this is EPA's characterization of, I'm assuming, interactions that they had with the scientists at NTP, so take EPA at their word, what they reported.

Q. So you agree that EPA's view, based on its discussions with the NTP group, is that NTP did not agree with IARC's analysis of the genotoxicity data on glyphosate-based formulations; is that fair?

A. Well, there's -- there is -- that -- this assessment and the discussions that the EPA had with NTP was no doubt specific to individual assays or individual

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study results. It's hard to say exactly what the details of those conversations were, but the -- you know, this -- this states that NTP felt that there was some methodological issues with some of the assays, and they apparently felt that the IARC Working Group reached some judgments based on some of the studies that the NTP scientists reviewed that they didn't have the same level of confidence in. So that -- you know, that's what I take it to mean.

Q. Okay. So let's turn back to your report, if we could, and where we left off was paragraph 9(a). I want to go to the next page, which is paragraph 9(b).

A. Okay.

Q. You state, "I also conclude that EPA's admitted failure to seriously assess the approximate 70 public literature studies on the genotoxicity of formulated glyphosate-based herbicides is why the agency errantly determined that 'glyphosate' is likely not genotoxic."

Do you see that?

A. Correct.

Q. Did I read that correctly?

A. Yes, you did.

Q. In other words, your opinion is that a key difference between the EPA review and the IARC review is that IARC reviewed studies on glyphosate-based

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formulations; is that a fair characterization?

A. Several of the studies reviewed and given considerable weight by the IARC Working Group were studies done on formulated glyphosate-based herbicides that were not reviewed or given heavy weight by EPA, yeah. Correct.

Q. And in your opinion, that explains -- that's part of the explanation as to why EPA and IARC reached different determinations on the genotoxicity of glyphosate and glyphosate-based formulations; correct?

A. Yes, sir.

Q. And just to restate that slightly, that -- in your view, that's a primary reason why IARC found strong evidence of genotoxicity, whereas EPA concluded that glyphosate is not genotoxic; correct?

A. Correct.

MR. FAYNE: Mark this as Exhibit 8. Yep.

(Exhibit 8 marked for identification.)

Q. (BY MR. FAYNE:) I've marked as Exhibit 8 a Q and A on glyphosate prepared by the International Agency For Research on Cancer in March 2016.

A. Yep.

Q. Have you seen this document before?

A. No. I don't believe I have.

Q. Can I just look at the copy I gave you? I'm

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sorry. I just want to make sure that I gave you the right one.

So if you look at the first bold question on page 1.

MR. KRISTAL: Well, I would ask that Dr. Benbrook, since he just said he doesn't think he read it, that he'd like to --

THE WITNESS: May I read it, please?

MR. KRISTAL: He should have the opportunity to read it before fielding your question.

MR. FAYNE: Absolutely.

MR. KRISTAL: Thank you.

MR. FAYNE: And, Dr. Benbrook, you're welcome to read the entire thing, but I'm only going to ask you questions about the first page and the first question on the second page.

THE WITNESS: Okay.

MR. FAYNE: The rest of it doesn't relate to genotoxicity studies, but feel free to take your time.

THE WITNESS: Okay.

So you're just going to ask me about the first question on the second page and that's it?

MR. FAYNE: The first page and the first question on the second page, correct.

THE WITNESS: Okay. I've read them now.

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Q. (BY MR. FAYNE:) So the first question on the first page states, "Could the carcinogenic effects of glyphosate be related to the other chemicals in the formulations?" And IARC responds "No."

Did I read that correctly?

A. Yes.

Q. And then if you look at the second paragraph of that answer, IARC explains that "For the experimental studies on 'pure glyphosate,' the monograph concluded that the evidence of causing cancer in experimental animals was sufficient and the evidence for causing genotoxicity was strong."

Did I read that correctly?

A. Yes, you did.

Q. And then turning to the next page, the question asks, "Could the co-formulants be the cause of the genotoxic effects reported in the IARC Monograph?"

Did I read that correctly?

A. Yes, you did.

Q. And IARC responds, "With regard to genotoxicity, the IARC Working Group evaluated" studies on -- "studies of 'pure glyphosate' as well as studies of glyphosate-based formulations. The working group reached the same hazard conclusion for glyphosate and for its formulations: they concluded that the evidence

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for genotoxicity was 'strong' for glyphosate and 'strong' for glyphosate formulations."

Did I read that correctly?

A. Yes, you did.

Q. In other words, IARC did not find a material difference between the genotoxicity evidence on glyphosate and the genotoxicity evidence on glyphosate-based formulations; is that a fair characterization?

A. No.

Q. Why not?

A. They -- they state clearly here that they -- they characterized and believe that the evidence is strong in both the case of pure or technical glyphosate and in the case of glyphosate-based formulations. There's no implied sort of comparison between the two that they're both strong.

Q. Okay. So let me rephrase it.

They categorized both glyphosate and glyphosate-based formulations in the same category for genotoxicity risk; is that fair?

A. Not precisely. They -- they characterized the data that was available to them on the genotoxicity of glyphosate technical as strong in that it pointed to genotoxicity effects. Independent of that, they

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evaluated the evidence on formulated glyphosate-based herbicides and also concluded that that evidence was strong, and that's what they're saying here. It's a slight distinction, but...

Q. You would agree that IARC reviewed the evidence on technical glyphosate and determined that the genotoxic risk -- that there was strong evidence of genotoxic risk; correct?

A. Yes.

Q. EPA reviewed the evidence on technical glyphosate and reached the opposite conclusion; correct?

A. The EPA's conclusion is stated clearly, and it says that -- the EPA reported that based on their review of data on the genotoxic effects of glyphosate technical and current typical levels of exposure, that there's -- there's not strong evidence of a mutagenic effect.

I think they used the word "via the oral route." So their conclusion is limited to glyphosate technical, and it's contingent on levels of exposure -- typical levels of exposure through the oral route or dietary.

Q. EPA has never found that glyphosate is genotoxic; correct?

A. That's actually a complicated question. I

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mean, EPA renders judgments about the genotoxicity of pesticides in a lot of different places at a lot of different times. Sometimes they'll review an individual study and say that there's evidence of genotoxicity in this one study, but then based on other studies and their weight-of-evidence evaluation, they may say that overall their judgment is that it's not.

Certainly this September 2016 report that we've been talking about I think is an accurate reflection of EPA's views at the time, and I believe it's still their view. So this would -- I would certainly agree with you that this is the most relevant contemporary summary of EPA's weight of evidence judgment about the overall database.

Q. You would agree that EPA's current judgment, which is consistent with its longstanding judgment, is that the weight of the evidence does not show glyphosate technical to be genotoxic; correct?

A. Based on typical levels of dietary exposure, that's -- that's the conclusion that they reached, yes.

Q. Or mutagenic?

A. Yes.

MR. KRISTAL: Objection to form.

A. Correct. The term -- I think EPA and many scientists use the terms "genotoxic" and "mutagenic" as

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roughly comparable.
Q. EPA has never made a weight-of-the-evidence determination that glyphosate is genotoxic; correct?
A. Not that I'm aware of.
Q. Turning back to the Q and A document from IARC.
A. Okay.
Q. As we were discussing previously, IARC reviewed the evidence -- genotoxicity evidence on glyphosate and found that there was strong evidence of genotoxicity, reviewed the genotoxicity evidence on glyphosate-based formulation and found that there was strong evidence of genotoxicity; correct?
A. Correct.
Q. Does that change your opinion that a key reason that IARC found strong evidence of genotoxicity is that it considers studies on glyphosate-based formulations whereas EPA did not?
A. No, it doesn't change my opinion.
Q. Why not?
A. Because the -- the impact in IARC's overall evaluation of the genotox database of the studies in directly exposed human populations and the various in vitro studies with formulated glyphosate-based herbicides were, you know, among the studies that in their narrative discussion and in their summary

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rationale statement, that the IARC Working Group pointed to as very, very important.
So, you know, I -- I think it's impossible to read the IARC Working Group discussion of the genotox database without being fully aware that the working group placed considerable weight in its overall judgment on the studies involving the formulated glyphosate-based herbicides.
And, you know, I think, you know, as I intimate in my -- in my expert report, had IARC not looked at any of the formulated studies, it still may have -- as it said, they felt that the data was strong on glyphosate, pure glyphosate or glyphosate technical, but still I think it had -- the data on formulated glyphosate-based herbicides, particularly data that arose from sort of real-world studies of exposed populations, were very important in their overall evaluation.
Q. I want to parse that a little bit. Is it your contention that IARC relied on studies, genotoxicity studies of formulated products, in reaching its conclusion that glyphosate technical was genotoxic?
A. Well, that's an interesting question, and it's a very complex question. I mean, both in the case of the EPA and in IARC, there -- there is -- there is an appropriate consideration of insights and data from

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studies on glyphosate-based formulations in assessing glyphosate technical and vice versa. So it's -- it would be artificial to build a fence between the two data sets and say that they're completely irrelevant to assessment of the other one.
So I -- you know, I think they -- they were -- they took into account the overall data on both glyphosate technical and formulated glyphosate-based herbicides.
Q. What are you relying upon for your contention that they took into account the overall data on both glyphosate technical and formulated herbicides in determining that glyphosate technical was genotoxic?
A. Just reading the report.
Q. So that just comes from this Monograph 112?
A. Volume 112.
Q. That's where your --
A. Correct.
Q. Let's turn back to your report. I'm sorry, let's turn to the OPP report, page 100.
A. Okay. I have it.
Q. And what I'm referring to are Tables 5.1 through 5.7, and they go from page 100 through --
A. 120 --
Q. Looks like page 125, I believe.

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A. Yeah, I was going to say 126, but my memory was not exactly correct.
Q. If one were to count up all the studies listed in these tables, it would be significantly more than 40; correct?
A. If one were to count up the assays.
Q. The assays, yes.
A. Yes. Correct.
Q. And the reason I'm referring to 40 is that you state in your report that EPA considered 40 of the approximately 55 studies of glyphosate in mammalian systems that IARC considered; correct?
A. Correct.
Q. So have you counted up how many studies EPA cited in these tables?
A. Yes.
Q. How many?
A. I don't recall the number off the top of my head. I've done a very thorough analysis of Tables 5.1 to 5.7 and a comfortable analysis of the IARC tables.
Q. I'll represent to you that the number is 84, that there are 84 --
A. Assays.
Q. -- assays listed in Tables 5.1 through 5.7. Does that sound about right?

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A. Uh-huh. It does.
Q. And by my count, if you look at the comparable tables in the IARC report, they considered 21 assay results on glyphosate technical.
Does that sound about right?
A. No. I don't think so.
Q. Okay. Do you want to -- we can go to the report, if you'd like. So if you look at the IARC monograph.
A. Let's see. I'm going to try to --
Q. And I should say 21 studies on glyphosate technical in mammalian systems.
A. Oh, okay. Well, that's slightly different.
Q. I apologize, yes. That was my --
A. That sounds about right.
Q. Okay. So just to restate that, so IARC looked at approximately 21 studies on glyphosate technical in mammalian systems; correct?
A. Correct.
Q. So EPA reviewed roughly four times as many studies on glyphosate technical in mammalian systems; correct?
A. Correct.
Q. In your analysis, you didn't take into account studies cited by EPA but not by IARC; correct?

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Your analysis didn't look at studies cited by EPA but not IARC; correct?
A. Yes, I did.
Q. Well, when you're counting up the studies and saying EPA considered 40 of the approximately 55, you're only looking at studies that IARC considered and then evaluating whether EPA considered them, as well; correct?
A. Can we parse that out a little bit?
Q. Sure. In your report you state that IARC -- strike that.
In your report you state that EPA considered 40 of the approximately 55 studies in mammalian systems that IARC considered; correct?
A. Yes.
Q. Those 40 studies are only ones that IARC considered; correct?
A. Those are 40 studies that IARC considered and predominantly peer-reviewed published studies.
Q. So in that calculation, you're not taking into account studies that EPA considered but IARC did not; correct?
A. I -- I didn't report that number, but I could have. It's in the -- you know, it would be -- it would come out of the tables I generated, yes.

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Q. So you didn't report that number in the results of your analysis; correct?
A. Not in -- not in the expert report, no.
Q. Why not?
A. I don't know. I mean, I was trying to be as thrifty as possible with the length of the report.
Q. So in your opinion, it wasn't important to your analysis that EPA had considered more studies on glyphosate technical in mammalian systems than IARC did?
A. It was certainly not important that EPA had considered approximately 23 or 24 reverse bacterial mutation studies on glyphosate technical. One of the features of the -- surprising features of the genotox database that EPA reviewed was that bacterial reverse mutation studies account for almost half of the overall number of studies across all categories of genotoxicity when EPA data requirements call for only one study, one bacterial reverse mutation study in technical using a pure -- pure technical active ingredient.
So it was clear that, for whatever reason, Monsanto and the other registrants conducted approximately two dozen reverse bacterial mutation studies and included those in the evaluation. And it's certainly my assessment and, I think, the assessment of the IARC Working Group and others that those additional

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negative bacterial reverse mutation studies didn't add a lot of new information to the database.
Q. I just, while we were sitting here, counted it up and it looks like there are 27 bacterial reverse mutation assays cited in the EPA report.
Does that sound about right?
A. Sounds about right, yep.
Q. So that means there's another 57 studies, genotoxicity studies on glyphosate technical, that were cited in the EPA report?
A. I'd have to pull out all my detailed sheets to get the exact number, but -- and don't forget, you know, in -- in some of the questions and some of my analysis, I -- I do include the bacterial reverse mutation studies on the formulated product too. So it gets -- it's a lot of numbers and a lot of categories and it can be a little confusing.
Q. Understood. But there are -- would you agree that there are a large number of studies -- strike that.
Would you agree that there are more than 40 studies that EPA considered on glyphosate technical that IARC did not consider?
A. Yes, I would agree with that.
Q. Would you agree that there are more than 50 studies on glyphosate technical that EPA considered that

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IARC did not consider?
A. I'd have to check. That's getting right up at the precise number.
Q. You state in Appendix C of your report -- and I don't think you need to turn there, but feel free -- that you recorded the results in an Excel spreadsheet.
A. Yes.
Q. Do you still have those files?
A. Yes.
Q. Is it a single file or multiple files?
A. It's a single workbook, and there is a worksheet for each of the tables, and the worksheets are linked together analytically so that the counts are automatically done, the summary counts. And I think I explain in the Appendix C methodology section the information that I moved into the spreadsheets.
Q. Have you produced those spreadsheets in this litigation, as far as you're aware?
A. No.
Q. But you'd be able to do that if asked?
A. Yes.
Q. In your report you also performed what I read as a separate analysis of regulatory genotoxicity studies as compared to genotoxicity studies published in peer-reviewed journals; is that accurate?

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A. Yes.
Q. You state in your report that you identified registrant-commissioned regulatory studies from EPA's 2016 report and Monsanto-commissioned genotoxicity review articles; correct?
A. Yes.
Q. Which Monsanto-commissioned genotoxicity review articles are you referring to?
A. Williams 2000, Kier 2013, Kier and Kirkland 2015 and Brusick, et al., 2017. I think Heydens too, Heydens, et al., 2018.
Q. How did you determine that a study was a registrant-commissioned regulatory study?
A. By a lot of work, a lot of work. So all of the registrant studies that are in the September 2016 EPA report have a full bibliographic citation, and all of the registrant studies have an MRID number and none of the public studies do. So that was a primary way.
Another way that I did it was that the same scientist has conducted multiple of the registrant studies, so I assumed that if a scientist -- if I had in the bibliography MRID -- MRID numbers for six studies that this particular scientist did and there was another study referenced in the table but it didn't have an -- it didn't cite an MRID number, I assumed that it

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was still a registrant-submitted study, particularly in the absence of a -- in the bibliographic entry, a reference to a journal where it was published.
Between the bibliography in the IARC report, the bibliography in the EPA report and in searching on the internet, I -- I was able to accurately identify, I believe, the registrant-submitted studies compared to the peer-reviewed studies.
Q. You're drawing a distinction between registrant-submitted studies and peer-reviewed studies?
A. Yes, sir.
Q. It's possible, right, that a registrant, such as Monsanto or some other company could conduct a study and submit it to a peer-reviewed journal; correct?
A. Yes.
Q. In those cases, did you count that as a registrant study or a peer-reviewed study?
A. As I explained before, the spreadsheets were built off of the core tables in the EPA report and in the IARC report, so if a study was in -- in the bacterial reverse mutation table in the EPA report, I'd move that study in and then I determined whether it was a registrant study, submitted study, or whether it appeared in a peer-reviewed journal.
Now, it's possible that there may have

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been -- you know, it's possible that there may have been a study where there was a registrant-submitted version of it and then the scientist also published it, but I -- I don't think that's the case because if that had been the case, such a study would have been referenced in either the Williams, et al., review or the Kier and Kirkland review or the Brusick review, and I'm sure that they would have referenced the peer-reviewed version of it, and I didn't find any -- I don't recall any examples of that off the top of my head. Although, you know, it's possible that I might have missed one.
Q. And I'm just trying to understand. If Monsanto conducts a study not for regulatory purposes, they conduct a study and submit it to a peer-reviewed journal, what category did you put it in, the regulatory study side or the published literature side?
A. I know of no such study.
Q. Let's say any registrant, not Monsanto. Any company conducts a study, they submit it to a peer-reviewed journal, does that go in the registrant side or the peer reviewed?
A. It goes in the peer-reviewed side. And there would be -- there would be a citation to it with the volume of the journal and it would be a public study.
Q. Are you aware of any studies on the registrant

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regulatory genotoxicity study side that does not have an MRID number?
A. I can't cite any right off the top of my head. The -- I think the EPA is pretty thorough in putting MRID numbers on all registrant-submitted studies.
Q. So would it be fair to say, at least sitting here today, you're not aware of any of the studies that you considered registrant-submitted that did not have an MRID number?
A. Actually, I think there are a few in the bibliography, and these were the ones that I struggled with where, for some reason, in the bibliographic citation in the EPA report there wasn't an MRID number.
But in those cases, I searched further, and often I was able to find a citation in usually Williams, et al., because Williams, et al., is a paper that came out in 2000 and summarized the early -- the early studies that Monsanto conducted and submitted to the agency.
I think most of these issues about the completeness of the bibliographic citation and the EPA report were on 1980s -- circa 1980s studies that were done and, you know, I think sometimes EPA was reminded of them or became aware of them through the Williams, et al., paper, and they sort of say that in their report.

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Q. Presumably you have a spreadsheet or other record of which studies you put in the registrant-submitted category and which studies you put in the public literature category; is that correct?
A. Of course. That's a data field in the -- in the workbook.
Q. So from that report, one would be able to identify how you categorize any particular study; correct?
A. Yes.
Q. And again, that's something that you still have available on your computer?
A. Yes.
MR. KRISTAL: Hasn't been deleted in the last two minutes?
MR. FAYNE: We're talking about a different analysis. I'm not sure we've established that it's the same spreadsheet.
MR. KRISTAL: Fair enough.
Q. (BY MR. FAYNE:) Is it the same spreadsheet?
A. It's not the same spreadsheet. It's in the same workbook.
Q. Different tab of the same workbook?
A. Correct.
Q. So you also state that you've identified

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studies published in the public literature; correct?
A. Correct.
Q. And these are studies that were cited either in EPA's 2016 report or the IARC monograph?
A. Correct.
Q. Did you find any other -- strike that.
Other than the studies cited in EPA's 2016 report and in the IARC monograph, did you consider any other studies in the public literature as part of this analysis?
A. If you -- if by "this analysis" you mean my comparison of the genotox studies cited in the September 2016 EPA report relative to Volume 122 IARC monograph, the answer would be yes.
Q. No. That wasn't my question. So my question -- and maybe it will be helpful to turn to your report.
A. Let me explain.
Q. Please.
A. When you say "this analysis," what do you mean? Do you mean my overall analysis of genotoxicity or my analysis of the comparing the two?
Q. What I'm referring to is your analysis of what you referred to as registrant-commissioned studies versus public-literature studies on genotoxicity.

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A. Okay.
Q. So I am trying to understand how you identified which studies were, quote/unquote, public-literature studies.
MR. KRISTAL: So do you want to ask the question again --
MR. FAYNE: Yes.
MR. KRISTAL: -- now that --
Q. (BY MR. FAYNE:) So with that understanding, you cite that -- you state that studies cited either in EPA's 2016 report or the IARC monograph were considered public lit -- strike that.
You identified public-literature studies from EPA's 2016 report and the IARC monograph; correct?
A. And the five literature reviews done by Monsanto.
Q. If you could turn to page 68 of your report.
A. Paragraph 68 or page?
Q. Paragraph 68. Thank you.
A. Okay.
Q. The second sentence of that paragraph states, "Likewise, all studies published in peer-reviewed journals that were cited by EPA and/or the IARC Working Group were analyzed, along with whether they reported 'positive' or 'negative' genotoxicity results."

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A. Correct.
Q. Did I read that correctly?
A. Yep.
Q. If I understand your testimony today, you also looked at the Monsanto review articles to identify public literature studies; is that correct?
A. May I read the first sentence --
Q. Yes.
A. -- in paragraph 68?
Q. Yes.
A. "All regulatory studies cited in the September 26 EPA report or in a Monsanto-commissioned genotoxicity review article were analyzed relative to 'positive' or 'negative' results. Likewise, all studies published in peer-reviewed journals that were cited by EPA and/or the IARC Working Group were analyzed along with whether they reported 'positive' or 'negative' genotoxicity results."
Q. Right. So, again, this is not a trick at all. I'm just trying to understand. As I read this, you identified regulatory studies from the EPA report and from Monsanto-commissioned genotoxicity review articles; correct?
A. Yes.
Q. And you identified public literature studies

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from the EPA report and the IARC Working Group report; correct?
A. And I think there were a couple that were also identified in the Monsanto-commissioned reviews.
Q. Okay. And that's all I'm trying to understand --
A. Okay. Yeah.
Q. -- is that you also looked to those reviews --
A. Yep.
Q. -- to identify public literature articles; correct?
A. Yes. It was a comprehensive analysis.
Q. How did you determine whether studies reported a positive or negative genotoxicity result?
A. By what the authors of the study said. And typically in the abstract.
Q. Did you rely on EPA's or IARC's characterization of the studies to do that?
A. Yes, absolutely, and that's, you know, often what EPA and IARC did.
Q. Were there any instances in which EPA and IARC characterized a study differently in terms of its genotoxic result?
MR. KRISTAL: You mean differently from what Dr. Benbrook characterized it or differently from each

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other had?
MR. FAYNE: Sure. I'll clarify the question.
Q. (BY MR. FAYNE:) Are there any instances in which EPA and IARC characterized a genotoxicity study differently than each other?
A. I think there are one or two examples where IARC considered a result indeterminate. They just couldn't -- couldn't -- weren't -- they weren't convinced that a study reported either positive or negative results, and I -- I can't remember if in maybe one or two cases EPA had reported the study as positive or negative. There might be one or two cases.
Q. In those cases, how did you resolve the conflict?
A. I stuck with what each -- if EPA said that the study was positive, then I reported it in the EPA table as "positive," and if IARC said it was indeterminate, then I put "indeterminate."
Q. I understand in terms of your EPA versus IARC comparison, but right now we're talking about your registrant-commissioned versus public literature comparison. I know that was a lot of terminology in that sentence. But I'm trying to understand -- let me -- strike that. Let me give you a more precise example.

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Okay. So if you turn to paragraph 71 of your report. You state that, "Of the 52 regulatory studies assessing the genotoxicity of glyphosate technical, only one reported a positive result, while 35 of the public-literature studies reported positive evidence of genotoxicity."
Other than the parenthetical I skipped, did I read that correctly?
A. Yes.
Q. So if EPA identified a study as having a positive result and IARC identified the same study as indeterminate, did you treat that as a positive result or as indeterminate in this calculation?
A. As I said, the worksheets within the workbook are driven precisely by what's in the tables. In the case of the EPA worksheets, the September 26th -- 2016 report, and in the case of IARC, the Volume 112. So if there was such an example, I recorded it -- I recorded the information as each of the respective organizations stated it.
Q. But when you're reporting the results of these studies, which you've gathered from two different places, how did you determine whether to report the result as a positive result or, I guess in this case, a non-positive result?

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A. I don't think that that situation ever arose. I mean, it's just not a -- it's not something that I dealt with, I had to deal with. You know, I understand that, you know, there -- I vaguely remember there was one instance, and I don't -- I don't think it affected the analysis in any way because of the way I structured the workbooks.

Q. Okay. So you're not sure, sitting here today, whether there was an instance where EPA classified a result as negative and IARC classified the same assay as positive?

A. There were no instances of that. I believe there might have been one instance for one assay where IARC's -- IARC classified it as indeterminate and EPA classified it as I don't remember whether it was positive or negative. And I actually -- I don't -- I'd have to go back and look.

I might have just eliminated that one from the overall count because -- for this -- for this particular part of the analysis because, you know, you're right, there's a conflict there.

Q. Is it possible that you've included in these results a study that EPA characterizes positive that IARC found was indeterminate?

A. No.

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MR. KRISTAL: And by "these results," you meant the count that we're talking about here?

MR. FAYNE: The counts.

MR. KRISTAL: No.

MR. FAYNE: Yes. Yes.

MR. KRISTAL: The count in paragraph 71?

MR. FAYNE: Sure. And again, I don't want -- that was an example, but I'm really referring to the counts in paragraph -- paragraphs 70 through 73.

MR. KRISTAL: Fair enough.

Q. (BY MR. FAYNE:) And it's your -- the testimony we -- the topics we've been discussing previously, that applies to all these paragraphs; correct? You weren't referring specifically to paragraph 71? Strike that. I can ask a more clear question.

When you were indicating that you're only aware of maybe one instance where there was a conflict between the two, that's across all of the different categories of regulatory studies, public-literature studies, glyphosate technical, glyphosate-based formulations; correct?

A. Yes, sir.

Q. In putting together these counts, did you do any analysis -- strike that.

In doing these counts, did you take into

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account whether EPA or IARC raised concerns about the reliability of a study?

A. I recorded the information as it was presented in the tables. You know, there are -- there are comments in -- in the results section of the EPA tables. For example, where it says "results," you will encounter some assays where EPA will say positive or negative, and then there will be some additional information, "positive at the highest dose tested," or something of that nature.

I -- I absolutely was thorough in capturing whether EPA or IARC, for a given assay, characterized it as negative or positive, but I did not strive to move into the spreadsheet the sort of the caveats or the additional information.

Q. So if, let's say, EPA and IARC both characterize a certain study as positive, you would, in your results, count that as a positive study; correct?

A. For both, correct.

Q. And you would not go back to look to see whether EPA or IARC said we have concerns about the reliability of this study; correct?

A. It -- if EPA or IARC put a study in one of its tables, I think the -- it's a fair read of the reports that they regarded those studies to be of sufficient

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quality to report a result.

Q. Understood. But if it was in the tables, you didn't go back to the narrative to see whether they had any commentary about the strength of the results or whether they were reliable; correct?

A. I understand your question now.

Well, you know, of course I carefully read the narrative several times. I didn't strive to incorporate any further discussion or assessment of study quality in -- in my accounting that we've been talking about in these paragraphs.

Q. Correct. And again, I'm just referring to your counting in these paragraphs. So in your counting, you didn't go back to the narrative to see if EPA or IARC said there are limitations for this study; correct?

A. Correct.

Q. If it was reported as positive in the table, you included it in your count?

A. Correct, or negative.

Q. Or negative, correct.

A. Right.

Q. Similar question. Did you yourself perform any assessment of the studies listed in your count to determine whether they were well-designed quality studies?

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A. Yes, I did.
Q. And did you exclude any studies on the basis that you didn't believe them to be well-designed?
MR. KRISTAL: In the count?
MR. FAYNE: In the count, yes.
THE WITNESS: No. I stuck with what EPA reported in the tables and what IARC reported in the tables, but I wanted to understand more thoroughly how some of the studies were designed, what some of the issues were. I was interested in dose levels in some cases. So I have a printout of essentially every single published genotox study in these tables. It's quite a thick file.
And as you note in my reliance list in the genotox bibliography, all of those studies are included in it.
Q. (BY MR. FAYNE:) But you did not exclude any studies from your count based on your review of the study design; correct?
A. Correct.
MR. KRISTAL: We've been going about another hour.
MR. FAYNE: Give me three more minutes.
MR. KRISTAL: Take five.
THE WITNESS: I'm good.

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MR. FAYNE: You're good?
THE WITNESS: I'm good.
MR. KRISTAL: Well, if you want to keep going, then I'll hand the microphone to Pedram while I step out for a minute.
THE WITNESS: We could probably power through to lunch.
MR. KRISTAL: That's fine.
Q. (BY MR. FAYNE:) So if you look at paragraph 70 through 73 of your report.
A. Okay.
Q. In these paragraphs you report the results of your counting of regulatory studies versus studies published in the scientific journals; correct?
A. Correct.
Q. And just to confirm, in these counts listed in these paragraphs 70 through 73, if a study was included in the IARC and EPA tables, it was included in these counts; correct?
A. That is correct.
Q. You did not exclude any based on your own review of the studies?
A. Correct.
Q. Can you turn to paragraph 75 of your report?
So as part of this analysis of regulatory

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studies versus public-literature studies, you also did a review of when the various studies were conducted; correct?
A. I did.
Q. And you state in paragraph 75 that "In terms of in vivo chromosomal aberration studies on glyphosate technical, the most recent registration study was completed in 1994, while two of three public-literature studies were done in 2012."
A. Correct.
Q. If you turn to the EPA or IARC report, whichever your preference -- I'm just trying to identify what those two studies conducted in 2012 are because I wasn't able to find them in the tables.
A. Okay. So we're in vivo chromosomal aberration. Let's see. Probably -- let's start here.
MR. ESFANDIARY: Are you referring to IARC or the EPA's report?
MR. FAYNE: Either.
MR. ESFANDIARY: All right.
THE WITNESS: So you want the more recent ones?
MR. FAYNE: I'm just trying to understand what the two in vivo chromosomal aberration studies on glyphosate technical that were done in 2012 --
THE WITNESS: Okay.

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MR. FAYNE: -- what you're referring to.
THE WITNESS: All right. So the in vivo test in the EPA report at Table 5.5 -- and you'll see it's 1983, 1982, 1994, 1990 and 1992. So in the -- in the IARC report -- and it gets confusing because, of course, they -- their taxonomy of genotoxicities doesn't track exactly the way that EPA did it. Whoops.
So the -- in Table 4.2 of the IARC report, which is page 49, there's a Koller, et al., 2012.
MR. FAYNE: Uh-huh.
THE WITNESS: And on the next page there's another assay from the -- I assume the same study by Koller, yeah, also published in 2012.
Q. (BY MR. FAYNE:) So you're referring to Table 4.2; correct?
A. Correct.
Q. So the first Koller, et al., study from 2012 is looking at DNA damage and in particular DNA-strand breaks and SCG assay; correct?
A. Yes.
Q. And your contention is that that is an in vivo chromosomal aberration study?
A. These are in vitro. Did you ask me about in vivo?
Q. I'm just reading paragraph 75 of your report.

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A. Okay.
Q. Well, yes, in vivo chromosomal aberration.
A. Okay. Then we got to go to a different table. Sorry.
And is it in humans or non-humans? Non-mammalian? Send me -- oh, okay. So we're talking about paragraph 75; right?
In vivo chromosomal aberration. Okay. So that starts here. Sorry. It's taking me a little while to remember how they organized all of this.
MR. KRISTAL: Well, it's more important to get it correct than quick.
THE WITNESS: Okay. Let me use a few minutes of my lunchtime to find them; okay?
MR. FAYNE: Sure. We can come back to it.
Q. (BY MR. FAYNE:) So let's turn to paragraph 79 of your report.
A. Okay.
Q. You state, "Based on the above analysis, I conclude that the dramatic differences in the results of genotoxicity assays reported in registrant-sponsored studies, in contrast to assay results appearing in peer-reviewed journals, arise from the state-of-science when various studies were conducted, coupled with the generally more sensitive assay systems used by the

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scientists publishing their results in peer-reviewed journals."
Did I read that correctly?
A. Correct.
Q. So if I understand your opinion correctly, you're citing two reasons that the genotoxicity assays reported in the registrant-sponsored studies differ from those appearing in peer-reviewed journals; correct?
A. Correct.
Q. And the first is the time when the studies were conducted?
A. Correct.
Q. And the second is that the public literature studies generally use more sensitive assay systems; correct?
A. Correct.
Q. What are the more sensitive assay systems that you're referring to?
A. Any assay system other than a bacterial reverse mutation study, and this is because of the well-known fact that bacteria don't have mitochondria and glyphosate targets mitochondria.
So it is no surprise to many scientists in the field that bacterial reverse mutation studies on both glyphosate technical and formulated glyphosate-based

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herbicides are predominantly negative, and so, hence, they're not as sensitive an assay to detect DNA damage of various sorts and other mechanism of genotoxicity.
So I would characterize, in effect, all of the other assay systems as more sensitive simply because of this particular quirk of that bacteria don't have mitochondria.
Q. So you would characterize -- just to make sure I understood what you just said, any assay other than the bacterial reverse mutation assay is what you would characterize as more sensitive; correct?
A. Correct.
Q. So just going through the EPA tables, in vitro mammalian gene mutation assays, those would be considered more sensitive?
A. Correct.
MR. KRISTAL: Maybe if we just speak a little more slowly.
MR. FAYNE: Yes, I will do that.
Q. (BY MR. FAYNE:) In vitro tests for chromosome aberrations in mammalian cells, that would be a more sensitive assay?
A. Yes, sir.
Q. In vitro tests for micronuclei induction in mammalian cells --

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A. Correct.
Q. -- that would be more sensitive?
A. Yes, more sensitive, certainly.
Q. Is it a fair characterization of your report to interpret the term or the phrase "more sensitive" -- "more sensitive assay system" to mean any assay system other than a bacterial reverse mutation assay?
A. Certainly among the assay systems that are covered in the September 2016 EPA report and the IARC report. There are other genotox assay systems that haven't been deployed in the assessment of glyphosate technical and GBH and genotoxicity, and I haven't reviewed all those and I'm not prepared to opine whether they're all more or less sensitive.
And it obviously becomes very complicated when you start assessing some of the genotox systems in non-mammalian organisms, earthworms and fish and et cetera.
Q. Would you agree that EPA considered all of these more sensitive assay systems in its 2016 and now 2017 reports?
A. They considered a few registrant-submitted studies in some of the categories and several in a few others, yes.

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Q. Which categories -- strike that.
Which types of more sensitive assay systems did EPA not consider?
A. Well, certainly the direct DNA damage in exposed human populations, the EPA didn't consider any of those studies. That's the table we looked at before with the four.
In the -- and we can go through each one of them and I'll characterize the differences, if you'd like.
Q. Well, I'm just trying to understand. We just walked through a number of more sensitive assay systems the EPA did consider; correct?
A. EPA considered at least a few genotox assays in each of the categories, but in several of the categories they -- they considered a far fewer number than the IARC Working Group.
Q. Would you agree that EPA considered some studies in each of the more sensitive assay categories on glyphosate technical?
A. Yes.
Q. You state in paragraph 78 of your report that "In my opinion, assays designed to detect direct damage to DNA in humans following exposure to a formulated glyphosate-based herbicide are the most important in

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evaluating glyphosate and glyphosate-based herbicide genotoxicity."
Did I read that correctly?
A. Yes.
Q. What is the basis of your opinion that assays designed to detect direct damage to DNA are the most important?
A. The emphasis placed on them by the IARC Working Group and the fact that they are based on real-world exposure levels that some exposed human population actually incurred.
Q. And again, so when we're -- when you're referring to assays designed to detect direct damage to DNA in humans, you're referring to those five assays in the first IARC table?
A. Yes.
Q. And that's the Bolognesi 2009 and the Paz-y-Mino studies?
A. Correct.
Q. Can you identify a peer-reviewed journal or other source that suggests that assays designed to detect direct damage to DNA are the most important in evaluating genotoxicity?
A. Well, as we -- as we've discussed --
MR. KRISTAL: Did you mean -- well, I object to

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the form unless you're tracking paragraph 78. Direct damage to DNA in humans. In other words, are you switching the --
MR. FAYNE: No. I'll ask the question again, but I'm tracking paragraph 78.
MR. KRISTAL: That's what I thought, but technically the question didn't include "in humans," so...
MR. FAYNE: Sure.
THE WITNESS: So could you restate it?
MR. FAYNE: I'll repeat the question.
THE WITNESS: Thank you.
Q. (BY MR. FAYNE:) Can you identify a peer-reviewed journal or other source, other than the IARC monograph, that supports your opinion that assays designed to detect direct damage to DNA in humans following exposure are the most important in evaluating genotoxicity in humans?
A. That's a very widely shared view. There are multiple peer-reviewed articles, including some that I am co-author of, that make essentially that statement and say that, to the extent that such studies are available in exposed human populations, they -- they clearly are the most relevant because they -- they avoid trying to interpolate from an in vitro study involving

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cells to an actual human body that's alive and is metabolically and physiologically active. That's obviously the most relevant study system, if you will, to try to understand the impact of any toxic chemical on human beings.
Q. As we discussed previously, EPA listed the studies that you referred to that were cited by IARC in Appendix D of its report assigning them a low quality evaluation; correct?
A. That's correct.
Q. Going back to the peer-reviewed journal question. You testified that there's a whole large number of studies that express that view. Can you identify for me one that you were not an author or a co-author of?
A. That expresses that view?
Q. Yes.
A. Well, let's see. There's a -- if you're going to ask me to, from memory, identify a peer-reviewed study that says that in exactly those words, I'm not prepared to do that, but I will be glad to find several that make that point, you know, but perhaps not in those exact words. It's not a -- it's not a -- I don't think you'll find any expert that would argue with that point.
Q. But sitting here today, you're not able to

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identify a study that expresses that viewpoint; correct?
A. Yes, I am able. If you want to give me the time to do it, I'll get online and I'll find them.
Q. Well, we can look at your reliance list, if you'd like. You've got a number of studies cited there. Are there any studies cited on your reliance list that express that viewpoint?
A. Again, I know -- I know where this is headed, and you're -- you're going to ask me to identify essentially that sentence, and if it's not there in exactly those words, then you're going to object.
So I -- I stand by my statement that it's a widely shared view and there are, you know, several peer-reviewed studies that -- that articulate that in the body of the -- the paper.
Q. And I'll ask the question again just because I don't think you've answered it yet.
That sitting here today, you cannot identify a study that you were not the author or --
A. You're kind of eating up my lunch. I'll pull out my computer.
MR. KRISTAL: No, no. You don't have to do anything --
MR. FAYNE: I'm not asking you to do that.
MR. KRISTAL: -- on your dime. If he wants you

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to look it up now as you sit here, we can do that.
THE WITNESS: Okay. I'll go to my room and I'll do it.
Q. (BY MR. FAYNE:) No, I don't want you to look it up right now. I'm just asking you as you sit here right now, without having looked it up, are you able to identify one?
A. No, I'm not.
Q. If you look in Table 5.7 of the EPA report.
A. Page, please.
Q. Page 122.
A. Okay. I'm there.
Q. This lists a number of assays for detecting primary DNA damage; correct?
A. Correct.
Q. When you refer to direct DNA damage, is that different than primary DNA damage?
A. No.
Q. So when you use the term "direct DNA damage," that means the same thing as when EPA says "primary DNA damage"; correct?
A. Correct.
Q. And as we've just been talking about, the EPA lists a number of studies that it considered evaluating assays for detecting primary DNA damage based on

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glyphosate technical; correct?
A. Correct. That's what Table 5.7 is.
Q. You've never designed a genotoxicity study; correct?
A. You already asked me that.
Q. I apologize. I don't remember the answer. Have you designed a genotoxicity study?
A. No, I have not.
Q. And you've never conducted a genotoxicity study; correct?
A. Correct.
Q. So your understanding of genotoxicity is based on reviewing published literature?
MR. KRISTAL: Are you asking these seriatim or exclusively published literature, or what?
MR. FAYNE: I mean, yeah, I'm going to ask you -- strike that.
Q. (BY MR. FAYNE:) Your understanding of genotoxicity is based on reviewing published literature and speaking to the experts in the field of genotoxicity; is that a fair characterization?
A. That's certainly the primary basis for my knowledge of genotoxicity assays.
Q. Would you agree that EPA has within its ranks a number of experts in the field of genotoxicity?

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A. Probably a few.
Q. Within the office of its pesticide programs?
A. Yeah. Within OPP, yes. I would -- I would assume that at any one point in time during the record of this case, there would be at least one or two Ph.D.-level scientists trained in some aspect of genotoxicity.
Q. And presumably there were -- some of those experts were involved in the preparation of the 2016 OPP report. Is that a fair assumption?
A. Well, the -- whoever was on staff at the time, yes.
Q. If you'd turn to page 126 of the OPP report.
A. Okay. I'm there.
Q. So this is the summary and discussion of EPA's genotoxicity section; correct?
A. Correct.
Q. And about midway through that first paragraph it states, "In the weight-of-evidence analysis, studies evaluating endpoints that measured gene mutations and chromosomal aberration, i.e., permanent DNA damage, were given more weight than endpoints reflecting DNA events that may be transient or reversible, such as primary DNA damage, for example, COMET assays."
Did I read that correctly?

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A. Yes, you did.
Q. So would you agree that EPA's view is that studies of primary DNA damage are less important than studies measuring endpoints such as gene mutations and chromosomal aberrations?
A. I think you might have misstated that.
Q. How so?
A. Well, why don't you redo the question.
Or you could reread the question if she took it down, whichever you'd like to do.
Q. I'll re-read it.
A. Maybe I just misheard it. It could be my fault.
Q. Would you agree that EPA's view is that studies evaluating primary DNA damage are less important in the weight-of-the-evidence analysis than studies evaluating endpoints measuring gene mutations and chromosomal aberrations?
A. In general, yes.
Q. And that's inconsistent with your view that studies of direct DNA damage are the most important; is that fair?
A. Oh, I don't know. That would take some thought.
Q. What about that statement is not fair?

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A. What EPA is getting at is that any genotoxicity assay that is capable of measuring or reports permanent inheritable damage to DNA is more worrisome than a genotoxicity assay that produces a response but one that's reversible, and that I agree to -- I agree with that view.
Q. And you agree that studies of direct DNA damage do not necessarily -- necessarily show a permanent response. They can be transient or reversible; correct?
A. Correct.
Q. So turning back to your report, go to paragraph 9(c). This is on page 8.
A. Going backwards.
Q. Skipping around.
A. 9(c). Are we on page 8?
Q. Page 8, yep. Actually, let me go back to the questions we were just discussing briefly. So as I think you just testified -- and I'll read it so that I make sure I get it correct -- is that "Assays that are capable of measuring or reporting permanent inheritable damage to DNA is more worrisome than a genotoxicity assay that produces a response but one that's reversible"; correct?
A. Correct.
Q. So you would agree that endpoints measuring

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direct DNA damage may be transient or reversible and thus not indicative of true genotoxicity; correct?
MR. KRISTAL: Objection.
A. It -- the damage might be heritable and permanent or it might not. Both can fall under that category of direct DNA damage.
Q. So positive results in those direct DNA tests are not necessarily indicative of true genotoxicity; correct?
MR. KRISTAL: Objection.
A. Well, I don't understand your use of the term "true genotoxicity."
Q. Are not indicative of a genotoxic effect; correct?
MR. KRISTAL: Objection.
A. I don't agree.
My understanding is that you've asked me if a genotoxicity assay that measures an impact which may be reversible, if you're asking me if I think that's not a genotoxic effect, then I do not agree with that, and nor do most scientists.
It is true that some impacts on DNA are repairable. It's also true that rarely are repairs fully successful, and that damaged DNA that isn't fully repaired is cumulative over time. So it's not

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appropriate, in my judgment, to dismiss genotoxicity assay results that are possibly repairable or reversible as not relevant or important.
Q. In your view, such assay results are the most important, is how I understood your report; is that not correct?
A. That's not correct.
Q. So when you say in your report that "Assays designed to detect direct damage to DNA in humans are the most important," how can I reconcile those two statements?
A. I think the problem that we have here is that direct damage to DNA can be permanent inheritable or reversible.
Q. Correct. And my question is, in light of that fact, isn't it true that studies looking at chromosomal aberrations that are not reversible, aren't those studies more important in evaluating genotoxicity?
A. I -- yes, and I've agreed with you on that multiple times. I think I have, anyway. Tried to.
Q. Sure. So now let's go to paragraph 9(c) in your report, which is on page 8. And about halfway through that paragraph you state, "I conducted a PubMed search for genotoxicity studies on glyphosate and glyphosate-based herbicides on November 19th, 2018, and

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identified 26 studies published since 2015, of which 25 reported positive evidence of genotoxicity in one or more assays."
A. Correct.
Q. Did I read that correctly?
A. Yeah.
Q. How did you perform your search?
A. Well, I went onto PubMed and typed in "glyphosate," "glyphosate-based herbicides," "genotoxicity," "mutagen," and probably a few other search words, terms. I've been -- I've done these searches before so I kind of used the same methodology.
Q. Based on that search, you identified 26 studies published since 2015; correct?
A. Correct.
Q. Did you exclude any studies from that number based on your review of the study design or quality?
A. No.
Q. The majority of the studies you identified were in non-mammalian systems; is that a correct statement?
A. I think -- don't I talk about that in the paragraph somewhere?
Q. Yes. I believe you state that --
A. 12 mammalian studies were all positive. So if there were 25 and 12 of them were mammalian, then about

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half and half.
Q. Yeah. I believe there were 26 studies total. 12 of those were mammalian; is that fair?
A. Yeah.
Q. How did you determine whether the studies were positive or negative for genotoxic effect?
A. By what the authors reported.
Q. So you reviewed the abstract or the body of the report?
A. No. I downloaded the full studies and often read most of them and certainly read the -- if the -- if the abstract was clear and I felt complete, I may not have read much more of the study, but in several of them I was quite interested in where the science has moved in recent years.
MR. FAYNE: Now is probably a good time for a break if you want to take a quick one and then maybe --
THE WITNESS: Is this lunch break?
MR. FAYNE: Well, it's 11 o'clock. Let's go off the record.
VIDEOGRAPHER: Off the record at 10:59 a.m.
(A brief recess was had.)
VIDEOGRAPHER: Back on the record at 11:10 a.m.
Q. (BY MR. FAYNE:) I'd like to shift gears now and turn to Dr. Parry's report, which you testified

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about -- or opined about in your report; correct?
A. Yes.
Q. So if we turn to page 477 of your report.
A. Maybe paragraph?
MR. KRISTAL: Paragraph.
THE WITNESS: Maybe paragraph?
MR. FAYNE: I'm really struggling with that today. Paragraph 477 of your report.
THE WITNESS: That's all right.
MR. FAYNE: Not quite that long.
MR. KRISTAL: Next deposition there will be 477 pages.
THE WITNESS: We'll catch up with it. So 477.
MR. FAYNE: Yes. Yes. This is the beginning of the Dr. Parry's section of the report.
THE WITNESS: The good Dr. Parry.
MR. KRISTAL: It's P-A-R-R-Y as opposed to E-R-R-Y.
Q. (BY MR. FAYNE:) So in paragraph 477, you state that, "In the 1990s, several positive genotoxicity studies were published," and then you cite the Lioi, et al., L-I-O-I, 1998, the Lioi, 1998 -- there are two of those -- the Bolognesi, et al., 1997 and the Clements, et al., 1997; correct?
A. Correct.

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Q. And as you discuss in your report, because of those studies Monsanto decided to retain Dr. Parry to undertake a review; correct?
A. Of those studies.
Q. Of those studies.
A. That's where they came from.
Q. Exactly. Correct.
A. Yeah.
Q. And Dr. Parry prepared a number of reports in which he summarized these genotoxicity studies that were in the public literature; correct?
A. And others.
Q. And others, including others in Monsanto's internal database of genotoxicity studies; correct?
A. Yes, sir.
Q. Dr. Parry did not conduct any primary research; correct?
MR. KRISTAL: You mean for Monsanto in this project?
MR. FAYNE: Strike that. Yes. Let me be more clear.
Q. (BY MR. FAYNE:) With respect to this project on behalf of Monsanto in the late 1990s, Dr. Parry was not performing any primary genotoxicity studies; correct?

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A. Correct.
Q. He was summarizing studies that already existed; correct?
A. Well, reviewing and -- and sharing his assessment of their quality and relevance and findings.
Q. Would you agree that his findings about what those studies showed were consistent with the findings of the study authors?
A. In general, yes.
Q. Are you aware of any instance in which Dr. Parry found a study to show a genotoxic effect when the author of that study had found the study to be negative?
A. I'm not aware of any such cases.
Q. So turning to paragraph 480 of your report, you state that in a letter --
A. Where are we now?
Q. Paragraph 480, just two paragraphs down.
A. 480. I thought you said 4E. 480, okay, I'm there.
Q. So in paragraph 480 you state, "In a letter dated August 18th, 1999, Dr. Parry transmitted his first of three evaluation reports to [redacted] -- M-A-R-T-E-N-S -- "a Monsanto toxicologist"; correct?
A. Correct.

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Q. What are you relying upon for your statement that Dr. Parry transmitted three reports?
A. My reading of the three reports.
Q. So you identified three reports in the discovery record --
A. Yes.
Q. -- from Dr. Parry to Monsanto?
A. Yes.
Q. Do you recall when the other two reports were submitted?
A. I don't remember the dates. I think two of them came together. There was an assessment of the studies and then a separate report on recommendations, so I counted that as a third report.
Q. Understood.
A. Does that help?
Q. That is helpful. I think that explains the disconnect. Thank you.
In paragraph 488, so now a couple of pages --
A. All right.
Q. -- further.
A. I'm with you.
Q. You state, "In the next several days, in early July, 1999, Monsanto officials discuss internally whether to commission the new genotoxicity research

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studies Parry recommended."
Do you see that?
A. Yes.
Q. Would you agree that it wouldn't be possible for Monsanto to discuss internally the studies that Parry recommended before he had actually submitted his recommendations?
A. Yes.
Q. I'll break this down for you. So Dr. Parry's report in August 1999, that was not Dr. Parry's first report; correct?
A. Well, can we just pull them all out?
Q. Yes. And again, it's not a trick. I'm just trying to understand your timeline.
A. If I -- if I made a mistake in my timeline, I'll readily admit it.
Q. Let's pull them out then, and I think we can clarify. Thank you.
A. Okay.
Q. So I'll mark this as Exhibit Number 9, and this is a report from Dr. Parry dated February 11th, 1999.
MR. KRISTAL: Thank you.
(Exhibit 9 marked for identification.)
Q. (BY MR. FAYNE:) So I'm showing you a document that's been marked Exhibit Number 9.

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Have you seen this before?
A. Yes.
Q. And is this one of the reports that Dr. Parry submitted to Monsanto?
A. It's my understanding this is the first one.
Q. So just to clarify the record, your understanding in your report that the August 1999 report was the first one is incorrect; correct?
A. Yes, this is the first one. The one that was just these four papers that I talked about in paragraph 477.
Q. Okay. You can put that to the side for a second.
A. Okay. So I got to fix this. It's probably the second.
Q. So turning to paragraph 80 of your report -- and I apologize. The Parry sections are -- there's a couple of them, so. Paragraph 80 of your report, which is on page 24.
A. 24, you said?
Q. Yes.
A. Okay. I'm there.
Q. You state that, "Dr. Parry provided 11 specific recommendations to Monsanto following his review of several published and Monsanto-commissioned genotoxicity

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studies."
Do you see that?
A. Yes.
Q. And I read that correctly?
A. Yes.
Q. And now I'm going to direct you back to paragraph 484. And you say --
A. Oh, Jesus. Hang on a second. 484. Got it.
Q. You state that, "In addition to his written reports, Dr. Parry provided Monsanto with a detailed list of recommended research activities to clear up lingering questions over the genotoxicity of glyphosate-based herbicides," and you cite MONGLY -- M-O-N-G-L-Y -- 01314264; correct?
A. Correct.
Q. And is this the -- are these the recommendations that you're referring to when you say "11 specific recommendations"?
A. It's the last of the Parry reports, by my accounting, and it's the one that spells out a number of recommendations, yes.
MR. FAYNE: So let's pull that out. So we'll cite -- or we'll mark as Exhibit 10 what I understand to be the second and third Dr. Parry reports, but you can confirm that for me once you have a chance.

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(Exhibit 10 marked for identification.)
MR. KRISTAL: Thank you.
THE WITNESS: Yes, these are -- these are the -- what I understand to be the penultimate and most complete report by Dr. Parry, upon his review of all of the genotoxicity assays that he was asked to review by Monsanto, as well as his recommendations for further research to resolve lingering questions.
Q. (BY MR. FAYNE:) And to be clear, you're -- the way you framed it in your report is that those are two separate reports?
A. The way that I first obtained these reports, they were referred to in different documents. I see these are MONGLY-numbered consecutively, but, as I said, they -- they were -- when I first encountered them, they were not a part of the same report. And I'm not even sure that they were, but, you know, I can probably go back in the record and try to determine that.
Q. Is it your understanding that both the first report setting forth his conclusions and the second report setting forth his recommendations, both of those were submitted to Monsanto in August 1999? Correct?
A. Yes. And as far as I know, they were the last reports from him as well.
Q. So I'd like to turn to the page you cite, which

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is --
A. Oh, yeah. Sure.
Q. -- a page ending in 4264.
A. Yes.
Q. So it looks like page 4264 lists some key questions, and then there's a -- at the bottom it says, "Deficiency in the data set," and then when we get to page 4265, it says "Actions recommended"; correct?
A. This is what I would regard as this third Parry report where he starts out laying out the key questions and then he makes his recommendations on what should be done to address the key questions.
Q. It's this report where he sets forth the 11 specific recommendations you referred to?
A. Correct.
Q. Could you explain how you count 11 recommendations in this report?
A. Yes.
Q. Please do.
A. Okay. Well, provide comprehensive in vitro cytogenetic data on glyphosate formulations. C-Y-T-O-G-E-N-E-T-I-C. That would be one.
The second, B, is another one where he's saying conduct these studies with and without antioxidant activities to see if -- if the impact is reversible.

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And then he recommends that these be under -- undertaken in an in vitro micronucleus assay in human lymphocytes. I'm not sure if I counted that as one or two. You know, I would have to go through and recreate my thinking.
Q. And again, I'm just trying to understand the basis of your opinion, so I'm trying to understand how you got to 11.
A. Right. So I took this document and specifically pages 2, 3 and 4 of it, and tried to identify the distinct clusters of work, and I -- I did so fairly carefully and I came up with 11.
Q. Okay. I think it would be helpful for me or for us to understand what those 11 are. So if we could keep walking through it. So I believe you testified that A is one. We agree on that; correct?
A. A is -- yes. So let's see if we can...
Q. And your testimony is that B is either --
A. Let --
Q. Please. Go ahead. Yeah.
A. Okay. So the recommendation "I recommend that both a) and b) should be undertaken using the in vitro micronucleus assay in human lymphocytes," that is another one. And I'll determine later whether it's two. He just says it would be cost effective.

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And then C is another one, "The induction of oxidative damage in vivo and determine the influence of antioxidant status. Determine the exposure concentrations of glyphosate which overwhelm the antioxidant status."

MR. KRISTAL: Chuck, could I ask you to just slow down a little bit. Amy's fingers are starting to burn up.

THE WITNESS: Okay. Sorry, Amy.

Q. (BY MR. FAYNE:) So just to stop you on -- are you counting C as one study?

A. Yes.

Q. Okay.

A. I believe so.

Okay. Next one -- hang on. So D is clearly another distinct assay, set of assays.

Trying to -- I can't recall as I sit here today whether I counted his number E, which is not to repeat the chromatoid exchange studies, whether I counted that as a recommendation for a new study or not. I think I didn't.

Q. But sitting here today, you can't say one way or the other whether you did or didn't?

A. Let me -- let me get to the end and if it adds up to 11, then I'll be pretty sure that I didn't.

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So Parry has also recommended the COMET assay in the liver and kidney of mice.

Q. So just to be clear, F is another study; correct?

A. Yes.

The in vitro data on surfactants is another recommendation.

So these are the distinct new study recommendations in this accounting by Parry, and I'll have to go back and see where I found the other ones, but I know there's 11 in a Parry document and I will find it for you.

Q. Okay.

A. Yeah.

Q. That's something you'll do during your lunch break or?

A. Well, I'll give it a try.

Q. So sitting here today, you're not able to recreate how you came up with 11; is that fair?

A. Right now. We'll see after lunch.

Q. And just to make sure we're -- to close the loop on this particular document of actions recommended, as I counted -- as you were speaking, I got six studies. Did you have a different number?

A. No. I had six. I think perhaps part of the

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explanation is that there are actually some recommendations at the first part of it that aren't addressed in the second part. That's -- may be. But I'll let -- give me a few minutes to recreate my thinking. I'm quite sure I have -- I can explain to you how I got to 11. I didn't make it up.

MR. KRISTAL: Are you reviewing -- Exhibit 10 is actually four documents. In other words, I don't know if you meant to include it as four.

MR. FAYNE: Excuse me, Counsel. I know it's not your deposition. I understand you're trying to be helpful and we can work this out later, but as I understand it right now, he's not able to recreate it --

THE WITNESS: Yeah. Yeah. Yeah.

MR. FAYNE: -- and we can come back to it.

MR. KRISTAL: Yeah. But if you want Dr. Benbrook to review to answer your questions, I don't think it's fair to him to have him do it over lunch. He should do it during the dep and ask questions.

MR. FAYNE: Okay. Well, then the answer can be that you don't know sitting here today how you came up with 11 and we can leave it there.

Q. (BY MR. FAYNE:) Is that -- that's your testimony, correct, right now you can't recreate how you came up with 11 studies?

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A. Oh, yes, I can. You know, but, again, it will take a little time.

Q. It makes it difficult for me to ask you questions about it if you can't tell me sitting here today what the 11 studies recommended were, and I'm referring to the document you cited in your report and asking you to count it.

A. Okay.

Q. I understand that right now --

A. I didn't bring my entire Parry file.

Q. I understand.

A. Which is about that thick. And in that Parry file I have the notes on how I counted these studies, and I'm sure that I have the --

MR. KRISTAL: We'll clear it up when I get a chance to ask questions. It's a pretty simple explanation, if you don't want me to say anything on the record. If you really want an accurate count, I can say something and then we can see if we can resolve it.

MR. FAYNE: Sure. Go.

MR. KRISTAL: If you don't, that's fine.

MR. FAYNE: Please go.

MR. KRISTAL: I'm not trying to --

MR. FAYNE: Please.

THE WITNESS: Can we go off the record?

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MR. FAYNE: Yeah. Let's go off the record.
VIDEOGRAPHER: Off the record at 11:31 a.m.
(A brief recess was had.)
VIDEOGRAPHER: Back on the record at 11:32 a.m.
Q. (BY MR. FAYNE:) You state in your report, Dr. Benbrook, that Monsanto refused to conduct new studies in nine of the 11 areas; correct?
A. Correct.
Q. How did you determine that Monsanto refused to conduct those studies?
A. Because they're not in -- there's no evidence of them being conducted, and also in their e-mail exchanges about responses to the Parry report, they say they're not going to conduct the studies that Parry recommended, with the exception of the micronucleus studies that they did to try to refute Bolognesi. They did, I think, four of those.
Q. So you agree that they did conduct some studies in response to Dr. Parry's recommendations; correct?
A. Yes. Yes. They did several bacterial reverse mutation studies and glyphosate-based formulations, and then they did I believe it was four micronucleus studies in the hope of refuting the Bolognesi findings.
Q. How did you become aware that they had conducted the studies to replicate the Bolognesi

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findings?
A. Well, they're in -- they're in the EPA document. They're in Kier and Kirkland. They're in Brusick.
Q. It's correct, is it not, that earlier in the Roundup litigation your opinion was that they had not conducted any of the studies that Dr. Parry recommended? Is that fair?
A. I don't recall if I said that.
Q. But at some point you became aware that they had in fact performed at least some of the studies Parry recommended; correct?
A. Yes.
Q. Have you conducted a search of the discovery record to identify any additional studies that Monsanto may have conducted in response to Dr. Parry's recommendations?
A. No. I have assumed that the four Monsanto reviews of genotoxicity studies represent a complete accounting of the studies that Monsanto did. I think the only exception is that there were some bacterial reverse mutation studies done for Brazilian regulators and Argentina regulators on formulated products that may not be in any of the Monsanto reviews. Those studies were brought to my attention in one of the earlier

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depositions.
Q. Are you aware whether any of the studies that Dr. Parry recommended already existed either in Monsanto's database or in the public literature?
A. Well, surely several of Dr. Parry's recommendations -- other scientists had done studies using those genotox assays, and Parry felt that it would be important to try to replicate them.
And so, yes, they're -- there were some published studies reporting the results of the assays that Parry recommended that Monsanto replicate using glyphosate technical and conduct for the first time using formulated glyphosate-based herbicides.
Q. If those studies were not cited in Dr. Parry's reports, you're not able to say one way or the other whether he was aware that those studies already existed; fair?
A. Yes. I wouldn't have any way to read his mind.
Q. So it's possible that Dr. Parry recommended further studies on certain assays that he wasn't aware that they already existed; fair?
A. I suppose he may not be aware of some registrant studies that Monsanto chose not to provide to him, yeah.
Q. Or public-literature studies; correct?

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A. He may -- he may have missed and not been aware of. Yeah, that's possible.
Q. So it's possible that some of the studies he recommended already existed without his knowledge; correct?
A. Sure.
MR. ESFANDIARY: Anything is possible.
Q. As we were discussing previously, Monsanto initially reached out to Dr. Parry because of the four studies that were published in the late 1990s; correct?
A. No, that's not correct.
Q. What's incorrect about that?
A. Monsanto reached out to Dr. Parry because they realized that they were in trouble in terms of the recently published studies reporting a genotoxic effect of both glyphosate technical and some other assays on formulated glyphosate-based herbicides.
They realized that these published studies in the peer-reviewed literature were in contrast to the universally negative genotoxicity studies that had been submitted to regulators, and they were looking for help from third-party experts, the independent scientists like Dr. Parry, to provide their views to regulators, to other scientists, to the media, relative to and in support of Monsanto's view of the genotox literature.

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So the purpose of the initial approach to Dr. Parry was vetting him as a potential future member of the Monsanto third-party network of experts who -- who Monsanto turns to from -- would turn to at various times to support their view of both registrant-submitted studies and peer-reviewed studies.

Q. You just testified that the studies that raised concern within Monsanto were those that were published in the peer-reviewed public literature; correct?

A. Those were among them, yes. This initial four were -- I don't think it was the only studies that they were concerned about at that time, but it was the first set. They were trying also to keep costs down. If you look at the e-mail exchanges, they were, you know, concerned about how much time Parry would have to invest in it, so they started with a fairly small assignment.

Q. So you reviewed the internal Monsanto e-mails and it's your opinion, based on those e-mails, that they were trying to save costs?

MR. KRISTAL: Objection.

A. No. It's my opinion that they were cognizant of the cost entailed in -- in hiring Dr. Parry to do a thorough review of the genotox literature. I think they were -- they clearly did not provide Dr. Parry all of the internal genotox studies that they had conducted and

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submitted to registrants.

I think they -- in Dr. Parry's reports, he does identify exactly what studies he was provided, and I doubt it's more than a quarter of the total Monsanto registrant-submitted studies. For example, they didn't provide him with 20 different bacterial reverse mutation studies that showed the same thing.

Q. And there would have been no reason to do that, correct, because they all show the same thing?

A. Correct. No -- no controversy on that matter.

But as the discussion and interactions between Monsanto and Dr. Parry went on, it was -- it's clear in the record that Monsanto became concerned about the cost of Dr. Parry doing the studies that he felt were needed to clarify some of the questions, the key questions that he identified.

In effect, Parry -- Parry was under the impression that as this dialogue went on, that he might be asked to do those studies. I'm not sure if he was, you know, ever told that directly, but I think he surmised that.

But in any event, at the end of the day, Monsanto decided that they would not do the studies and that it would take too much time and cost too much money to -- to allow Parry to do all the things that he

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recommended to bring them around to their view of genotoxicity of glyphosate and glyphosate-based herbicides.

Q. I'd like to focus on the studies in the public peer-reviewed literature that found a positive genotoxic effect in the late 1990s; okay?

A. Yeah.

Q. Those are studies that Dr. Parry reviewed for Monsanto; correct?

A. I believe there were three different sets of studies. You know, it was the -- we talked about the first set, which was only four, and then there was another set, and then there was another set. And this -- the report that we've been talking about here in Exhibit 10, it's my understanding this was the final one that integrated Dr. Parry's review of these three tranches of sets of studies.

Q. So going back to those -- let's just talk about the four studies you cite in paragraph 477 of your report; okay?

A. Okay.

Q. Those are all published in the peer-reviewed literature; correct?

A. Correct.

Q. They would be available to EPA; correct?

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A. Yes.

Q. And, in fact, you're aware that those studies were submitted to EPA as part of a 2002 tolerance approval process; correct?

A. I'm not aware of that.

Q. You don't recall that from prior depositions?

A. No, I don't.

Q. Any reason to believe that those studies were not submitted to EPA? And I'm not -- strike that.

Those studies were submitted to EPA by commenters, not by Monsanto; correct?

A. I don't recall.

Q. Any reason to believe that they were not submitted by commenters?

A. No.

Q. So let's turn to paragraph 498 of your report. So you state in paragraph --

A. Hang on.

Q. Oh, sure.

A. 498?

Q. 498 on page 110?

A. Got it.

Q. You state, "In my opinion, Dr. Parry's reports triggered an obligation to (1) report the information to the EPA; (2) update the Roundup label to disclose the

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potential of genotoxicity risk following significant and/or long-term exposures to Roundup; and (3) conduct the various studies proposed by Dr. Parry to exposure the genotoxicity of formulated glyphosate-based herbicides."

Did I read that correctly?

A. Yes.

Q. So if I understand your opinion in this paragraph, there are three separate parts to it; correct?

A. Yes.

Q. So I'd like to break those down and take them one at a time, if that's okay.

A. Fine.

Q. So first you state that Dr. Parry's reports triggered an obligation, presumably from Monsanto, to report the information to EPA; is that correct?

A. Correct.

Q. What is the source of the obligation from Monsanto to report those studies to EPA?

A. FIFRA, Section 6(a)2(B), the adverse health effects reporting requirement.

MR. KRISTAL: That's FIFRA, F-I-F-R-A, all in caps.

Q. So you're aware that EPA has adopted

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regulations implementing FIFRA Section 6(a)(2); correct?

A. Yes.

Q. Have you reviewed those regulations?

A. Yes.

Q. When was the last time you reviewed them?

A. It's been many times. Probably in the last couple months when I -- there are two of the -- two of the passages from 6(a)2(B) are quoted verbatim in the report, so it would have been in late November.

Q. And just to be clear, you've reviewed the regulations in the 40 CFR Part 158?

A. Yeah. Yes, sir.

Q. And your opinion, based on your review of those regulations, is that Monsanto had a legal obligation to submit the Parry report; is that correct?

A. Yes.

Q. And when you say in your opinion that it triggered an obligation to report the information to EPA, what information specifically are you referring to?

A. Parry's conclusions that glyphosate technical and formulated glyphosate-based herbicides appear to pose genotoxic risk.

Q. You testified previously that you're not aware of Dr. Parry drawing any conclusions from those studies that were different than the conclusions drawn by the

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authors of the study; is that fair?

A. I don't believe I said that. I mean, I -- I've taken Dr. Parry's report at its word.

Q. Understood. But Dr. Parry didn't look at those studies and find a genotoxic effect where the author of the study had not found one; correct?

A. I'm not aware of any episode of that or example of that.

Q. You also testified previously that these studies were in the public literature; correct?

A. Correct.

Q. So EPA had access to them; correct?

A. Correct.

MR. FAYNE: Mark this as Exhibit 11.

MR. KRISTAL: Thank you.

(Exhibit 11 marked for identification.)

Q. (BY MR. FAYNE:) I'm showing you an exhibit marked Number 11, which is 40 CFR Part 159, Subpart D. And it's Reporting Requirements for Risk/Benefit Information.

A. Correct.

Q. You've seen this before; correct?

A. Yes.

Q. And if you look at Section 159.152, it states, in paragraph C, that "Compliance with this part will

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satisfy a registrant's obligations to submit additional information pursuant to Section 6(a)(2)"; correct?

A. Correct.

Q. And these regulations were adopted in the late 1990s; correct?

A. Correct. And changed a couple of times.

Q. Sure. More -- if you look, for instance, at the very end of this document, you can see that they were adopted initially in September 1997, and then amended in June 1998, correct, at the very bottom?

A. I see -- yes, I see that. Yep.

Q. If you turn to Section 159.155.

A. Okay.

Q. "When information must be submitted."

A. Yeah.

Q. And Subpart A reads, "The following reportable information must be received by EPA not later than the 30th calendar day after the registrant first possesses or knows of the information"; correct?

A. Correct.

Q. And then it lists seven categories of information; correct?

A. Correct.

Q. Which category do you contend Dr. Parry's reports fit into?

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A. Well, the -- in -- I don't remember exactly in my report where I quote from 6(a)2(B). It states clearly that consultant reports are -- including preliminary reports -- are among the data that, and information, that should be provided to the agency if -- and on the understanding that the information is new, has new value. Registrants are not under an obligation to submit over and over again the same information that has been provided to the agency.

So the -- the component of Parry's report that in my judgment triggered an obligation to provide the information to EPA under 6(a)(2) was his -- his conclusion that there is valid science suggesting that both glyphosate technical and formulated glyphosate-based herbicides have genotoxic potential, which is not the conclusion or the information that Monsanto had provided to the EPA.

Q. Let me -- I'm going to parse what you just said.

If I heard you correctly, you stated that Section 6(a)(2) of FIFRA states that expert reports must be submitted.

A. That consult -- yeah. Yeah. Reports commissioned by a registrant, done on behalf of a registrant, and I think they actually use the term

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"consultant."

Q. So if I look at FIFRA Section 6(a)(2), I'll see language about experts and consultants?

A. The passage is in my report. We can find it.

Q. Understood. But I'm not asking about your report. I'm asking about the statute itself.

Your contention is that the statute itself --

A. I can't remember if the passage I quoted is actually from FIFRA or if it's from the implementing regulations. I don't recall exactly where it -- where it is, but it's an official statement of what EPA requires under 6(a)(2).

Q. You would agree that the EPA regulations are EPA's official statement about what's required to be submitted; correct?

A. Well, they're part of it, yeah.

Q. And as we discussed previously, Section 159.152 states that compliance with this part satisfies a registrant's obligations; correct?

A. Yes.

Q. So you would agree that if a registrant complied with 40 CFR Part 159, Subpart D, they've complied with their reporting requirements under Section 6(a)(2) of FIFRA; correct?

A. I believe this is the full set of requirements

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under 6(a)(2), yes.

Q. And so previously we were discussing Section 159.155; correct?

A. Okay.

Q. And that section provides when information must be submitted. So my question to you again is: What category of -- which of these seven categories does the Dr. Parry report fit into?

A. The first one, scientific studies, I suppose. It's -- Parry's report was a scientific review, review, study.

Q. Okay. Well, let's -- let's turn to -- so scientific study is described in 159.165. So why don't we turn to 169 -- 159.165.

A. Okay.

Q. So 159.165 lists -- it looks like there's toxicological studies, ecological studies, results from a study that demonstrates any toxic effect, and then (d), incomplete studies. Did I state that accurately?

A. Yes.

Q. I presume you're referring to this as a toxicological study; is that correct?

A. Parry's review, it's a review of toxicological studies involving genotoxicity assays, yeah.

Q. Okay. So Section 1 under "Toxicological

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studies" states that, "The results of a study of the toxicity of a pesticide to humans or other non-target domestic organisms if, relative to all previously submitted studies, they show an adverse effect under any of the following conditions," and then they list a number of conditions.

We discussed previously that Dr. Parry did not conduct a primary genotoxicity study; correct?

A. Correct.

Q. He was reviewing summaries -- strike that.

He was reviewing studies in the published literature and in the Monsanto database; correct?

A. Well, he was reviewing and integrating the information to render his expert opinion on whether the existing genotoxicity database confirmed or didn't confirm the potential of glyphosate technical and GBHs to pose a genotoxic risk, and he reached a conclusion that, in fact, the studies taken en masse did, and that a variety of additional studies would be required to clear up ambiguity or uncertainty in the interpretation of the existing studies.

Q. Dr. Parry didn't create any new data; correct?

A. He didn't carry out any primary studies. We've already agreed to that.

Q. And the data that he was summarizing is data

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the EPA already had in its possession and could review itself; correct?
A. I believe all of the studies that Monsanto provided to Parry were either a registrant study that had already been submitted to EPA or a study in the peer-reviewed literature.
Q. You would agree that EPA is capable of reviewing those studies and assessing for itself whether they show a genotoxic risk; correct?
A. Yes.
Q. You testified previously that Dr. Parry's report provided new information that was not previously known to the agency. What new information?
A. That an internationally recognized expert in genotoxicity that Monsanto reached out to, because of his technical competence and experience, upon examination of a set of studies, reached a different conclusion than Monsanto did about the genotoxic potential of glyphosate and glyphosate-based herbicides.
That is -- that is exactly the significance of Parry's work and analysis that is important in the record of this case.
Q. When EPA determines whether or not pesticide poses a genotoxic risk, does it rely on the registrant's characterization of the studies or does it review the

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studies itself and reach a determination?
A. It -- it typically relies on the registrant's characterization of the study.
In certain times in history, they'd just cut and paste the registrant summaries. I think it's a matter of considerable uncertainty the degree to which EPA does a true independent assessment of some of these studies. I think that that's a cluster of issues beyond what we're dealing with in this case.
But it is -- it is -- it is clear to me that Parry's integration of the results of the studies that he was asked to look at drew upon his -- his years of experience and knowledge about the various ways that exposures to a chemical can damage DNA, and that his integration, his weight-of-the-evidence judgment, if you will, to use a term of art that is also used by EPA and IARC, that his weight-of-the-evidence judgment and integration of that data was in fact a new and important scientific finding.
MR. ESFANDIARY: Zach, it's two minutes to 12:00. Would this be a good time to --
MR. FAYNE: No. But give me a few more minutes.
MR. ESFANDIARY: All right.
THE WITNESS: Yeah. Let's finish this -- let's

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finish Parry.
Q. (BY MR. FAYNE:) Is it your position that the authors of the studies that Dr. Parry reviewed were not experts in genotoxicity?
A. No.
Q. The authors of those studies, you would contend, were experts in genotoxicity; correct?
A. Well, they conducted the studies. I don't -- I haven't reviewed the résumés of all of the scientists that conducted those studies, and particularly there would be no way to do so on the registrant-commissioned studies.
Q. Let's focus specifically on the studies that were in the published literature, not the registrant-commissioned studies.
Would you agree that the authors of those studies that we've been discussing, that they were qualified experts in genotoxicity?
A. Yes.
Q. And the authors of those studies concluded that -- they ran a study. It showed a genotoxic effect. Correct?
A. Some of them, yeah.
Q. And EPA had access to their conclusions, correct, because they're in the published literature?

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A. Correct.
Q. We also discussed previously that EPA has experts in genotoxicity; correct?
A. Yes.
Q. They perform a weight-of-the-evidence analysis of the genotoxicity data; correct?
A. That's what they said that they did, yes.
Q. That includes both registrant-submitted studies; correct?
A. Yes.
Q. And published-literature studies; correct?
A. Yes, sir.
Q. And in their most recent evaluation in 2017, EPA considered the studies that Parry relied upon; correct?
A. I believe that's the case, yes.
Q. When I say "Parry relied upon," I mean the studies cited in Dr. Parry's reports; correct?
A. Correct.
Q. So in December 2017, EPA reviewed those studies and concluded that the weight of the evidence did not show glyphosate to be genotoxic; fair?
A. Through the oral route of exposure based on typical levels of residues in the diet, yes.
Q. Did they find glyphosate to be genotoxic

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through any route of exposure?
A. They didn't address the other routes of exposure or the other exposure levels.
Q. Your understanding is that when EPA assesses the genotoxic potential of a pesticide, it only looks at the oral route of exposure, in the case of glyphosate?
A. No, that's not my understanding.
Q. So did they evaluate whether glyphosate poses a genotoxic risk through other routes of exposure?
A. Not to any significant extent, you know, in terms of the content of the September 2016 report. And had they done such an analysis, they would not have included the additional phrase "through the oral route of exposure." They would have said, "through the oral and inhalation or dermal routes of exposure."
They clearly felt that their judgment about genotoxic risk was conditioned upon typical levels of exposure through the diet, and that's why they included that phrase in their summary statement.
Q. You've never assisted a pesticide manufacturer or any other company in evaluating whether to submit information under 6(a)(2); correct?
A. Some -- you know, I think some 6(a)(2) issues came up in my work for a pesticide manufacturer called Appropriate Technology Limited. I did some work with

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them on registration matters in the '90s.
Q. You think or you -- do you recall what those 6(a)(2) issues were, sitting here today?
A. No, I don't. It's been a long time, but I think they were among the issues that we talked about.
Q. But you're not sure sitting here today --
A. Yeah.
Q. -- whether they were --
A. It's been a long time.
Q. Have you ever published in a peer-reviewed journal about 6(a)(2) reporting requirements?
A. No.
Q. Ever assisted EPA in evaluating the 6(a)(2) reporting requirements?
A. No.
MR. FAYNE: We can take a break now if this is a good time to stop.
THE WITNESS: So is this lunch?
MR. KRISTAL: Yep.
VIDEOGRAPHER: Off the record at 12:04 p.m.
(A lunch was had from 12:04 p.m. to 1:13 p.m.)
VIDEOGRAPHER: Back on the record at 1:13 p.m.
Q. (BY MR. FAYNE:) Welcome back.
A. Thank you.

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Q. I'd like to turn now to page 96 of your report.
A. All right.
Q. And this is a section of your report where you're discussing the TNO study; correct?
A. Correct.
Q. Which was a dermal penetration study?
A. Yes, sir.
Q. The study was conducted in 2002; correct?
A. Correct.
Q. And it was conducted in response to some questions from EU regulators; correct?
A. That was certainly one of the motivating factors, yes.
Q. And by "EU," I should say, European regulators; correct?
A. Correct.
Q. So performed for compliance purposes in Europe; agree?
A. To augment the dossier the Germans were putting together.
MR. FAYNE: I'm going to mark as Exhibit 12 the final TNO report.
THE WITNESS: Thank you.
MR. KRISTAL: Thank you.
(Exhibit 12 marked for identification.)

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Q. (BY MR. FAYNE:) Turn to page 25 of 41. Actually, let me strike that.
Have you seen this document before?
A. Yes, sir.
Q. This is the final TNO report; is that correct?
A. Final of several, yes.
Q. But this was the final --
A. As far as I know, this is the final.
Q. When you say "final of several," you mean there were several drafts before this --
A. Yes.
Q. -- final report; correct?
A. Correct.
Q. And I know, if you could let me finish my question.
A. Sorry.
Q. And the study is titled "In vitro percutaneous absorption study with C14 glyphosate using viable rat skin membranes"; correct?
A. Correct.
Q. Would you turn to page 25 of 41.
A. Okay. I'm there.
Q. The second paragraph states, "In general, the poor recoveries combined with the high variation within the glyphosate test groups make the data generated in

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this study unsuitable for risk assessment."
Did I read that correctly?
A. Yes, you did.
Q. And you cite this statement in your report; correct?
A. I do.
Q. In other words, the study authors concluded that the data generated were unsuitable for risk assessment. Do you agree with that?
A. Certain aspects of it.
Q. Which aspects do you not agree with? Sorry, were you saying you agree with certain -- you were agreeing with the fact that the study authors stated certain aspects were not reliable for --
A. Correct.
Q. -- regulatory purposes?
Let me ask the question again just to make sure the record is clear.
The study authors concluded that the data generated are unsuitable for risk assessment; agree?
A. That's -- that's what they wrote, yes.
Q. Do you have any basis to disagree with their conclusion that it was not suitable for risk assessment?
A. Just that there -- there are -- as they say, they're highlighting poor recoveries as one issue.

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There was also a lot of variability in some of the autoradiography aspects of the study, which were highlighted, but there were other aspects of the study that weren't highlighted or discussed as problematic.
Q. For the areas of the study that were highlighted as problematic, do you have any basis to disagree or any reason to disagree with the author's conclusion that those aspects were not suitable for regulatory purposes?
A. I think there's -- there is a history in these sorts of studies of poor recovery. Some of the Monsanto-commissioned skin penetration studies had very low recoveries. It's a -- it's a problem in aspect in skin penetration studies that scientists that do this sort of work struggle with.
So I agree that the recoveries in this report were -- were low or poor, but they weren't unprecedented in terms of other studies that have been done of this sort.
Q. Do you agree with the study authors that this report -- that this study was unsuitable for risk assessment?
A. That's their judgment of it, yes.
Q. Do you agree with that judgment?
A. I think there are -- there are aspects of this

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study that I think are reliable for risk assessment purposes.
Q. Do you agree that the study overall was not suitable for risk assessment purposes?
A. I think the -- as I said, I think there's aspects of the studies that -- that were not changed through the four drafts that I know of that were not highlighted as problematic. There are certainly other aspects of the study that are highlighted as a problem and a source of concern.
So I -- you know, I recognize that -- that TNO in this last version made this statement that they didn't -- they didn't feel that the study was up to snuff for risk-assessment purposes, and in fact it's why they offered to reproduce the study or redo the study at no cost, to clear up any ambiguity about the findings.
Q. You state -- you just testified and you state in your report that TNO agreed to reproduce this study at no cost.
A. Correct.
Q. What are you relying on for that statement?
A. A MONGLY e-mail where -- let's see -- through [redacted] or [redacted] one of the -- one of the Monsanto Europe scientists that were interacting with TNO directly was reporting to his colleagues about a

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recent interaction with TNO over the remaining questions about certain aspects of the study.
Q. So your testimony is that there is an e-mail, internal Monsanto e-mail, in which they report about conversations with TNO; is that correct?
A. Yes. There's several.
Q. You're not aware of any e-mail from an employee or an agent of TNO suggesting that they would do the study at no cost?
A. No. Just Monsanto, a Monsanto employee reporting that that's what he was told by TNO.
Q. Would you agree that TNO would not agree to repeat a study at no cost if they didn't believe that there were issues with the first data generated in the first study?
A. You know, I think -- I think TNO was aware of some of the issues with the recovery and the autoradiography.
There's a -- this back-and-forth with TNO went on for over a year, and there's multiple e-mails in the record of where Monsanto scientists are explaining to Donna Farmer or Bill Heydens or other Monsanto officials what happened with the TNO study and what they -- what they feel it found and the risks that it posed to the future freedom to operate for glyphosate-based

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herbicides in Europe. There's a -- yeah, there's a very -- there's an extensive back-and-forth about it.

Q. If you turn back to page 25 of the report, it also states that, "The properties of the formulation made it difficult to quantify the exact amount applied onto the skin and to guarantee contact of the fluid with the entire skin surface."

A. Yes.

Q. And the next sentence states, "These problems may have caused the irregular recovery and the high variation of the absorption data"; correct?

A. Correct.

Q. So they're identifying a number of problems with the study; correct?

A. Yeah. Potential problems, potential explanations.

Q. Would you agree that Monsanto was not required to submit this final report? And right now I'm just referring to the final report, that Monsanto is not required to submit this final report to EPA?

A. Well, they -- I don't think they would be required to submit the final report had they submitted the first draft report, which they surely were required to submit.

Q. We'll get to that in a second.

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A. Okay.

Q. But just relying -- referring just to this final report in which the study authors conclude that the study is unsuitable for risk assessment; correct?

A. I think -- I'm not -- so I'm understanding your question to be just about this version of the report, notwithstanding what happened with the earlier versions, and I -- I really don't know the details of the regs well enough to say whether they would be obligated to submit the study anyway given that there were some issues with it. I'd have to look at that in more depth.

Q. That's because you're not familiar enough with the regulations to say one way or the other, sitting here today, whether this should have been reported; correct?

A. It's just this is a -- a thorough answer to that question would require me to refresh my memory about which aspects of the study they've acknowledged in the body of the report.

This is the -- this is the conclusions page. This is the end of it. In the body of the report, they actually talk about in more detail what some of the problems were, and I would have to evaluate whether those -- those problems, you know, rendered the whole report unreliable, or just aspects of it. That would

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come into play in answering your question.

Q. Sir, I'm asking you what testimony you intend to offer at trial of this matter, and my question is whether you intend to testify that Monsanto had a legal obligation to submit this report to EPA?

A. I will certainly testify that Monsanto had an obligation to submit one of the TNO reports. They all -- all of them have the same core finding with the exception of the revision of the dermal penetration rate for the technical glyphosate concentrate.

There was a revision between the initial draft and the second draft in the skin penetration rate for the technical glyphosate from 1 point something, 1.12, to .52. That was the only change in the core findings of the report, and those core findings are stated in exactly the same way in all four versions, with the exception of that -- that one revision that happened between the first draft and the second draft.

After the second draft, so in the third and fourth, that number also did not change. So what I regard as the core findings and the most important findings and certainly the most important findings to Monsanto in terms of the perceived threat to glyphosate's freedom to operate in Europe, was those core findings, which did not change from one version of

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the report to the final version.

Q. We were discussing previously that in this final report, the study authors identified a number of problems with the study that made it unsuitable for risk assessment; correct?

A. That is what they say, yes.

Q. Were those same issues present in the prior version of the study?

A. Not all of them. The discussion of the problems, I don't believe there was really any in the initial draft. I think there was some in the second draft, quite a bit more in the third draft, and not -- not many changes between three and four.

Q. And I'm not asking you about the discussion of the problems. I'm asking you about the problems with the data itself.

They didn't recreate the study; correct?

They generated data once and then wrote several drafts --

A. Correct.

Q. -- of the report; right?

A. Right. It was the interpretation of the same set of analytical results.

Q. So the data issues they identified in this final report, those would have been present for the

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first draft, the second draft, the third draft, et cetera; correct?
A. Correct. I understand what you're getting at now. Yes.
Q. So fair to say that the study authors would have reached the same conclusion with respect to draft one, that it was not suitable for risk assessment purposes; correct?
A. No, I can't -- I can't say that. I mean, it's a hypothetical.
After this series of communications with Monsanto that extended over a whole year where Monsanto was extremely upset about the findings of the study, didn't want to -- didn't believe them, felt that there was something wrong with the study, at the end of that discussion, the TNO people agreed to put in this paragraph that said they didn't -- they felt that the poor recoveries and some of the other problems with the study render it unsuitable for risk-assessment purposes.
That's -- that's what TNO has said. TNO did not retract the empirical findings, the core empirical findings, which I would have expected them to do if they felt they were unreliable.
Q. In the final report, TNO identifies poor recoveries; correct?

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A. Correct.
Q. Those poor recoveries would have existed at the time of the first draft of that report; correct?
A. Correct.
Q. TNO also identifies in the final report high variation within the test groups; correct?
A. Correct.
Q. That high variation would have been present at the time of the first draft of the report as well, too; correct?
A. Correct.
Q. You've testified today and stated in your draft report -- or, excuse me. Strike that.
You testified today and stated in your report that your opinion is that Monsanto should have submitted the draft TNO report; correct?
A. Yes, sir.
Q. You agree that that draft report did not have a signed GLP compliance statement; is that correct?
A. No, I don't agree with that.
Q. Okay. Why don't we --
A. Yeah. Let's take a look. There's a -- there's a bunch of forms at the beginning of it, at least in the beginning of the one that I...
So I guess the signed -- those signed -- wait.

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Yeah, here. Here they are.
So there's quality assurance statement on page 6. There's a statement of GLP compliance on page 5. There's a testing facility acknowledgment on page 8, and a GLP compliance monitoring unit statement on page 7.
Q. And sorry to -- sorry to interrupt, but you're looking at the final report; correct?
A. Oh, okay.
Q. I'll --
A. Yes.
Q. I'm going to mark as Exhibit 13 --
A. Now, don't you be tricking me that way.
Q. I wasn't trying to, trust me.
MR. FAYNE: I'm going to mark as Exhibit 13 the June 14th, 2002, draft TNO report.
MR. KRISTAL: Thank you.
(Exhibit 13 marked for identification.)
THE WITNESS: Okay. I have this in front of me.
Q. (BY MR. FAYNE:) So if you turn to page 4 of 35, you'll see that there's a statement of GLP compliance. Do you see that?
A. Yes.
Q. And you see that the statement of GLP

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compliance was not signed by the study director.
A. Correct.
Q. Correct?
A. Correct.
Q. You would agree with me that GLP compliance statements are an important part of any GLP study?
A. Of course.
Q. It allows the -- anyone reading the study to understand that it was conducted pursuant to good laboratory practices; correct?
A. Correct.
Q. And until the study director signs that statement, there's no guarantee that the study has been conducted in accordance with good laboratory practices; correct?
A. Well, certainly not from the laboratory.
Q. Can you turn to page 5 of 35? There's a quality assurance statement. Do you see that?
A. Yep.
Q. And about two-thirds down the page there's a statement about the report being audited; correct?
A. Yes.
Q. And that section is not filled out yet because this report --
A. Right.

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Q. -- had not yet been audited; correct?
A. Correct. It states right upfront it's the unaudited draft report.
Q. Would you agree with me that the data that the study authors relied upon in the final report were the same as the data that they were relying upon in this draft report? Correct?
A. They -- they re-did a few of the calculations, and they -- as I said, they did make an adjustment in one of the core findings, but that was done between draft report number 1 and the second version and did not change in the subsequent two versions.
Q. Between draft report number 1 and the final report, TNO didn't conduct any new primary studies; correct?
A. Yes, sir. That's my understanding.
Q. As I understand your report, your opinion is that draft reports such as this draft TNO report should be submitted to EPA; correct?
A. Yeah. It would fall under the category of a preliminary report. That's the term that EPA uses in -- or maybe it's from the U.S. Congress -- in the 6(a)(2) statute.
Q. So based on your review of the statute and presumably EPA's regulations, it's your opinion that

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Monsanto had a legal obligation to submit this report?
A. Yes.
Q. So your view is that EPA would have wanted to rely on this draft report over the final report which said that it was not suitable for risk-assessment purposes?
A. I didn't say that.
Q. So do you agree that the final report is more important to EPA's review of glyphosate?
A. Typically final reports are more refined and often include additional analyses that may have been done between when the initial draft report was done, but I think the critical feature of the TNO -- this TNO project and report was that the core findings, the most important findings, the findings that were of great concern to Monsanto, did not change between the initial draft report and the fourth -- the final version, with the exception of the one number that I mentioned already.
Q. And those core findings are the same findings that TNO said in the final report were unsuitable for risk assessment; correct?
A. They didn't specifically say that those findings were unsuitable.
Q. They did say that the data generated in the

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study were unsuitable for risk assessment; correct?
A. Yeah, they said -- you know, they said data that was generated in the study was unsuitable.
Q. So if the data generated in the study was unsuitable, wouldn't that suggest that the core findings of the study were unsuitable?
A. If TNO had felt all of the data was unsuitable, I think they would have deleted the findings from the study.
Q. What's your basis for speculating that TNO would have deleted the findings from the study?
MR. KRISTAL: Objection to the form.
A. If they felt that they were unreliable and unsuitable for any use, including risk assessment, they would have deleted the -- deleted the findings.
Q. How do you know that TNO would have deleted the findings?
A. How do I know? Well, I guess I don't. I'm not part of their organization. I don't know what their policies are.
But just a read of their studies, it is pretty clear the areas of the study where there were issues that were discussed between the Monsanto scientists and the TNO scientists, issues which were identified in the later versions of it as -- in particular, the poor

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recoveries and the -- some issues with the autoradiography. Those are discussed in increasing detail in the third and then final version of the report.
But there's -- there's no discussion in any of the versions of the reports about the core main findings. And my -- my sense is that, if they had felt that those findings were also incorrect, that they would have changed them or deleted them.
Q. In paragraph 17 of your report, you state -- and you're welcome to turn to it, but you probably don't need to. I'll read it to you. You can tell me if you need to turn to it.
MR. KRISTAL: Well, he's not going to be able to acknowledge if you read it correctly unless he's memorized --
MR. FAYNE: Okay.
MR. KRISTAL: -- the report.
THE WITNESS: So are we talking page 17?
MR. FAYNE: Paragraph 17. Go ahead.
THE WITNESS: Okay. Won't take me long to get there. Okay. I'm there, sir.
Q. (BY MR. FAYNE:) You state, "At several stages in the regulatory history of glyphosate and Roundup brand herbicides, this report documents episodes in

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which I conclude Monsanto failed to meet obligations imposed on it by federal law and EPA regulations."

Did I read that correctly?

A. Yes.

Q. I understand from your prior testimony today that you contend that Monsanto should have submitted the Parry report and TNO study to EPA; correct?

A. Correct.

Q. Other than those two events, can you identify for me any other action that you claim Monsanto took that violated federal law or EPA regulations?

A. In the 1986 registration standard, EPA imposed on glyphosate registrants -- which at the time were only Monsanto -- a requirement to add a number of worker safety provisions onto the label. They gave them until June of 1988, I believe. I don't remember the exact date. It's in my report. Monsanto refused to add those additional worker safety provisions onto the label, and to this date they're not on the label.

EPA requested Monsanto to do a repeat mouse oncogenicity study to resolve the issues in the 1983 Bio/dynamics study. Monsanto refused to conduct that study. After the resectioning of the slides and the even deeper controversy over the 1983 study, EPA designed a special study designed to resolve the kidney

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tumor issue in the Bio/dynamics mouse study, and Monsanto refused to carry that study out.

In the reregistration -- again, the registration standard document of 1986, Monsanto called for a repeat mouse and a repeat rat study, and they -- the mouse study was not done. There was a rat study underway that was subsequently submitted to EPA and which satisfied that data requirement. Those are the main ones that I can recall.

Q. So let me just parse that very briefly. You contend that Monsanto violated EPA regulations by not adding the worker safety provisions set forth in the 1986 registration standard; correct?

A. Correct.

Q. You contend that Monsanto violated the EPA regulations by failing to resolve the issues in the 1983 Bio/dynamics study; correct?

A. Well, failing to repeat it. That was the first request that EPA made of Monsanto, but -- and then there was a subsequent request to do this more -- this sort of specially designed and statistically powerful study to settle the issue over the kidney tumors, and those are the primary ones that I spend -- you know, that I discuss in my report.

Q. So just to make sure I'm clear, your contention

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is that by not repeating the mouse study in the 1980s, Monsanto was in violation of EPA regulations; correct?

A. When -- when the agency puts a requirement in a registration standard document and states that it must be done by a particular date, if a registrant doesn't do that, then they haven't followed an EPA requirement, yeah.

Q. Are you aware of whether EPA ever made a finding that EPA was in violation of a regulatory requirement?

A. You mean that Monsanto was in violation?

Q. Yeah. Let me restate the question. Thank you.

A. Okay.

Q. Are you aware of whether EPA ever made a finding that Monsanto was in violation of a regulatory requirement?

A. You know, I don't -- I'm not aware of a -- I guess I am aware that there were -- there were formal findings on some inappropriate advertising that the enforcement division of EPA investigated and forced Monsanto to change the content of some advertising which was not in compliance with EPA regulations for truthful advertising. I think there was maybe four episodes of that; one or two in Iowa, a couple in New York, and maybe one or two others.

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Q. So I'll come back to that later. I'm referring specifically to the two violations that you asserted a few minutes ago. So the first -- strike that.

You testified that Monsanto was in violation of EPA regulations by not adding the worker safety language from the 1986 registration standard; correct?

A. When EPA establishes a requirement in a registration standard and states that it should be done by X date, if the registrant doesn't do that, then, yes, they would be in violation of a requirement in a registration standard, and it's part of EPA regulations that registrants have to do what's in a registration standard to maintain their registrations.

Q. Are you aware of whether EPA ever made a finding in connection with that 1986 registration standard that Monsanto was in violation of the labeling requirements?

A. I'm not aware if they did or not.

Q. You also testified that you believe Monsanto was in violation of the EPA regulations for refusing to conduct the repeat mouse study in the 1980s; correct?

A. Correct.

Q. Are you aware of whether EPA ever made a finding that Monsanto was in violation of the EPA regulations in connection with that event?

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A. No, I don't -- I don't believe they ever made a finding. It was just a debate over mouse oncogenicity, you know, that has persisted now for 30 years.
Q. Do you have any knowledge of the communications between Monsanto -- strike that.
In your report you detail a number of communications between Monsanto and EPA in the 1980s; correct?
A. Yes.
Q. Some of those relate to the 1986 registration standard; correct?
A. Yes. Yes.
Q. And as we were just discussing in that registration standard, EPA set forth a requirement for certain labeling provisions related to worker safety; correct?
A. Correct.
Q. Other than what you've spelled out in your report, are you aware of any other conversations or communications between EPA and Monsanto regarding the labeling requirements in the 1986 registration standard?
A. Yes.
Q. What communications?
A. Well, dialogue that went on between the 1986 registration standard and the 1993 R.E.D. I mean, it

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was an ongoing discussion about what additional worker safety provisions should be on all of the Roundup labels.
Q. So you agree that there was an ongoing discussion --
A. Oh, yes.
Q. -- between Monsanto and EPA about what language should go on the label; correct?
A. Correct.
Q. And you would agree with me that you're not aware of every conversation or communication between Monsanto and EPA related to that subject; correct?
A. Well, I certainly am sure there were many face-to-face meetings where there's no record of what was -- what transpired, you know, during the meeting. So, yes, I couldn't possibly be aware of all of them.
Q. Would you agree with me that ultimately EPA must approve every label on a formulated pesticide product?
A. Well, every new label that is approved and then eligible to go on a pesticide product, yes.
Q. So Monsanto couldn't label its products with certain language unless it had EPA's approval to do so; correct?
A. Correct.

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MR. KRISTAL: You mean the actual label? Label can mean advertising, marketing.
MR. FAYNE: Sure.
Q. (BY MR. FAYNE:) So EPA -- Monsanto couldn't put language on the label of its pesticide product without EPA approval; correct?
A. Yes. That's correct.
Q. EPA will not approve a label unless, in its view, the label directions and safety precautions are sufficient to ensure that the pesticide will not cause any unreasonable adverse effect on man or the environment; correct?
A. That's the basic standard in the FIFRA statute, and it's certainly the goal and the hope of EPA and registrants that all provisions that go onto labels will achieve that.
But in the case of the worker safety provisions in the 1986 registration standard which EPA felt were required to and justified to reduce applicator, mixer/loader exposures, those -- those were never put onto the label because Monsanto refused to do so, argued that they weren't needed, argued that there was a generic revision of the worker safety standard that was moving through the system and that any final action on additional worker safety provisions on the labels should

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be deferred until that was completed, and on and on and on.
And, you know, basically Monsanto disagreed with the EPA over the need for any additional worker safety provision, so there's really no substantial additional worker safety provision put on a -- on a Roundup label that I'm aware of since the mid '80s.
So EPA thought additional provisions were justified and said so in the 1986 registration standard, and they were -- and Monsanto did not feel they were justified, and EPA didn't -- did not feel it was warranted to start a cancellation action over that disagreement, and so they never appeared on the label.
Q. You would agree with me that ultimately EPA accepted Monsanto's position. Otherwise, they would not have approved Monsanto's labels; correct?
A. I can't think of a -- of a single case where EPA cancelled the registration of a pesticide over, you know, a work -- you know, a single worker or a, you know, a half dozen worker safety provisions. It just -- it never was done. I'm not aware of any example of that.
And I clearly don't -- I think it would be hard for me to imagine how EPA could justify or politically withstand the reaction if they had tried to cancel

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Roundup over those -- those -- that page and a half of additional worker safety provisions that Monsanto refused to put on its label.

So EPA had a choice, and they -- they were not willing to exercise their legal right to initiate a cancellation action, and so Monsanto prevailed in that -- in that event.

Q. Just to understand -- strike that.

Just to make sure I understand your testimony, you're suggesting that if EPA had stated that it was going to cancel the pesticide registration if Monsanto didn't put the worker safety language on the label, that Monsanto would have played a game of chicken and waited for EPA to cancel the registration?

A. Well, that -- that is the only -- that would be the only option that -- given that it's Monsanto's responsibility to generate the labels and to also write any alternative label language in a label amendment, the changes on the label have to come from Monsanto and be submitted to EPA.

Monsanto was unwilling to propose adding the additional worker safety provisions on any of the Roundup labels. EPA could have initiated a cancellation action for Monsanto's failure to comply with a requirement in the 1986 registration standard. They

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were clearly within their rights to do that.

They could have done it, but they did not do it, and in my professional judgment, they did not do it because they felt that it was not a significant enough of a concern to entail the administrative and political cost of trying to cancel a widely-used herbicide.

Q. Is your testimony that if EPA does not agree with the language that a pesticide manufacturer proposes for its label, its only option is to cancel the registration?

A. Well, so you're talking about a situation where there is an existing registration, a valid federal registration for -- for a glyphosate-based herbicide. If -- if Monsanto chose not to add the, say, the worker safety provisions that were in the '86 registration standard onto that label, that label remains in effect and the herbicide could continue to be used until such a point in time when EPA initiated a cancellation action and actually, you know, carried it through to the end.

Q. There are hundreds of Roundup formulations; correct?

A. There are something on the order of 125 registered products. There are clearly not a hundred different formulations. Many different products have essentially the same formulation. There's probably --

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at any one time over the history of glyphosate-based herbicides manufactured and sold by Monsanto, there's probably 90 percent of the volume is from six or so different formulations, or very modest changes in them.

Q. Anytime Monsanto, or any pesticide manufacturer, introduces a new end-use product, they have to get approval from the EPA for the label; correct?

A. That's correct.

Q. So any time after 1986 that Monsanto wanted to introduce a new glyphosate-based product, it would have to get approval from the EPA for the label on that product; correct?

A. Correct.

Q. Isn't it the case, Dr. Benbrook, that the EPA could reject any of those applications for a new end-use product if it didn't agree with the worker safety language on the product label?

A. Yeah, technically they could, but what -- what would be the point, because the existing registrations would stay on the books and be active? It wouldn't end the use of the -- of the herbicide.

Q. But without EPA approval, Monsanto wouldn't be able to introduce new glyphosate-based products; correct?

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A. Yeah. If the EPA denied an application for a new version of Roundup, they could do that, yes.

Q. Are you aware of the EPA ever denying an application for a new version of Roundup based on failure to include the worker safety language from the 1986 registration standard?

A. I know there were -- there were a few requests that didn't go through. I can't -- I can't recall whether they were just label amendments or wholly-new products, and I don't recall whether the worker safety provisions or lack thereof was the primary reason or one of the reasons. I'd have to research the registration file to answer that.

Q. So sitting here today, you cannot say that you're aware of any instance in which EPA denied an application for a new version of Roundup based on failure to include the worker safety language from the 1986 registration --

A. Yeah, that's what I said. I can't -- I can't think of one. I'm not -- I'm not convinced that there aren't any, but I can't think of them.

Q. I'd like to go to paragraph 391 of your report.

A. I'm there.

Q. So this is your discussion of the new worker safety language --

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A. Yes.
Q. -- in the 1986 registration standard; correct?
A. Uh-huh. Correct.
Q. And paragraph 391, you note the EPA's primary concern that led to their decision to include this language in the registration standard document was eye and skin irritation; correct?
A. Correct.
Q. Not cancer; correct?
A. Correct.
Q. Turn to page 398.
A. Paragraph 398.
Q. I'm sorry.
A. It's all right.
Q. I'll get it right one of these times.
A. You got it right the time before.
Q. You quote from the registration standard document; correct?
A. We're talking 399?
Q. 398.
A. Oh, okay. Yes.
Q. And you quote from that document that, "Worker safety rules must appear on end-use products containing glyphosate, except for those labeled for homeowner use only"; correct?

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A. Correct.
Q. And that is consistent with the current EPA regulations which require worker safety statements only on products that bear directions for use in agriculture; correct?
A. There's a lot in that question. In the registration standard this language was not required on the home use end-use products that had a very low concentration. I believe 3 percent was the cutoff, so...
Q. So you agree that under the 1986 registration standard, Monsanto was not required to add the new worker safety language on products labeled for homeowner use only; correct?
A. Correct. Yes.
Q. Do you know whether the glyphosate-based products used by Mrs. Stevick were labeled for homeowner use only?
A. I didn't -- as I said in the beginning, I've not reviewed any case-specific information.
Q. So you do not know whether the glyphosate-based products used by Mrs. Stevick were labeled for homeowner use only; correct?
A. I don't know what products she used so I can't answer the question.

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Q. You also don't know what products Mr. Hardeman used; correct?
A. Correct.
Q. Or what products Mr. Gebeyehou used?
A. Also correct.
Q. You agree that EPA has sole authority within the federal government to approve pesticide registrations; correct?
A. What -- EPA does provide some authority to state departments of agriculture to do certain state-specific registrations, but that authority is in effect transferred from the EPA, so I think we're in agreement.
Q. So you agree that EPA has sole authority within the federal government to approve pesticide registrations; correct?
A. Yes.
Q. And that means every pesticide sold and distributed in the United States must be registered and approved by EPA; correct?
A. Correct.
Q. We were discussing previously that EPA has authority to cancel or suspend a pesticide registration; correct?
A. We spoke about that some, yes.

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Q. And you state in your report at paragraph 179 that, "As of 1994, cancer risk was the most commonly cited reason for pesticide cancellation and suspension actions."
A. Correct.
Q. Has the EPA ever cancelled or suspended the registration of glyphosate?
A. No.
Q. Would you agree with me that EPA endeavors to apply a health-protective approach when it evaluates pesticides?
A. Not always.
Q. So your testimony is that EPA does not always apply a health-protective approach?
A. Correct.
Q. In what circumstances does it not apply a health-protective approach?
A. A highly -- in the case of contested regulatory actions, EPA has been forced politically to reach comprises with registrants to bring about a degree of risk reduction when in fact the agency would have preferred and felt that a greater degree of risk reduction was probably warranted.
The EPA -- the regulatory process and the interactions with registrants on high-risk pesticides,

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it is a bit of a dance, and EPA doesn't always get everything that it feels is justified or warranted.

And so, you know, I -- I do believe that EPA has fallen short of bringing about the degree of risk reduction that -- that certainly their own reports seem to consider justified.

Q. You would agree that under FIFRA, EPA is required to ensure that any pesticide registered for use in the United States does not pose an unreasonable risk to human health or the environment. Is that fair?

A. That's the basic standard for adverse effect, is the term of art, not risk.

Q. And you would also agree with me that under the Food Quality Protection Act of 1996, EPA must find that a pesticide poses a, quote/unquote, reasonable certainty of no harm before it can be registered for use on food; correct?

A. Correct. Well, it's actually they have to determine that there's a reasonable certainty of no harm from establishing a pesticide tolerance. The tolerance must be in place before EPA will consider a registration application authorizing the use of the pesticide on the food crop for which the tolerance applies.

Q. Okay. In your prior depositions you've been asked about EPA's data requirements; correct?

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A. Yes.

Q. And I don't want to go through those at length again today, but EPA does have a prescribed set of data requirements for pesticide registration; correct?

A. Yes.

Q. And those cover a number of different areas such as product performance, toxicology, human exposure; correct?

A. They -- there's no longer any requirement for product performance data except in the case of antimicrobial pesticides. That used to be part of the requirements but it dropped out I think in the '72 or '78 amendments to FIFRA.

Q. And as I understand, both from your expert report and your prior deposition testimony, you do not intend to testify that Monsanto failed to comply with mandatory data requirements that are set forth in the regulations at Part 158; is that correct?

A. With the exception of the circumstances and incidents that I've already discussed relative to the replacement of the mouse onco study, replacement rat study, and the study that was -- the special study that was designed.

You know, one could -- certainly the replacement rat study would have been a core -- a core data requirement. The special study that was designed by EPA to resolve the lingering uncertainty over the kidney tumors, that -- that's not a study that was part of the core data requirements. It would be an additional study.

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Q. EPA also has authority to require registrants to submit additional studies and data; correct?

A. Correct.

Q. So EPA is not limited by the data requirements in Part 158; fair?

A. Correct.

Q. If EPA doesn't believe the information required under Part 58 -- 158 is sufficient to evaluate the potential of a product to cause harm, it can require that additional data be submitted; fair?

A. Very -- very true.

Q. And that could be through a formal data call-in or a more informal request to the registrant; correct?

A. Correct.

Q. EPA can also waive data requirements; correct?

A. Correct.

Q. And it might do that if the data might not be useful to the agency's evaluation?

A. Yeah. Because, for example, they have a very similar study.

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Q. Right. So they might have a similar study or it might be an irrelevant route of exposure; correct?

A. Correct.

Q. I'd like to turn now, since we've been talking about it a bit already, to your discussion of the 1983 mouse study --

A. Okay.

Q. -- which starts on page 64 of your report.

A. Yes, sir. I'm there.

Q. So this section refers to the long-term cancer study in mice that Monsanto submitted to EPA in 1983; correct?

A. Yes.

Q. And you state on page 4 of your report that this -- sorry. Page 4, paragraph 6(b).

A. I'm there.

Q. That this was the first valid chronic -- first chronic -- sorry, first valid chronic oncogenicity study on glyphosate; correct?

A. Yes.

Q. So you agree that the 1983 long-term cancer study in mice was a valid study?

A. Yes.

Q. So going back to Section 6 of your report where we just were. This is on page 64.

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A. Got it.
Q. So in this section, you summarize in detail the back-and-forth between Monsanto and EPA. Is that a fair characterization?
A. Yes.
Q. Summarize documents from the public record and internal Monsanto e-mails; true?
A. Correct. Most of the material on the 1983 Bio/dynamics study is in the public -- in the public domain. EPA cleared dozens of documents, and I -- I had already downloaded those and studied them for other projects that I've been involved with.
Q. I know you've testified about these events in prior depositions, so I just want to walk through a few aspects of it, if that's okay.
A. That would be fine.
Q. You state in paragraph 277 of your report that "Bio/dynamics concluded in its report that the slightly increased incidence of adenomas in the high-dose males was considered spurious and unrelated to glyphosate administration."
Did I read that correctly?
A. Yes, you did.
Q. EPA initially reviewed the Bio/dynamics report and disagreed with that conclusion; correct?

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A. That's correct.
Q. So EPA did not simply accept Monsanto's interpretation of the results; it pushed back on them?
A. It did.
Q. And then as you summarize here -- and again, I don't want to walk through this in too much detail today, but that set off a long series of back-and-forth between Monsanto and the agency; fair?
A. Absolutely fair.
Q. Monsanto submitted several letters setting forth its position; correct?
A. Correct.
Q. EPA provided responses in various letters and memoranda; correct?
A. Yes.
Q. EPA convened multiple meetings of senior scientists?
A. Correct.
Q. Monsanto representatives met with the EPA on multiple occasions?
A. Yes.
Q. EPA requested that the kidney slides be resectioned and reevaluated; correct?
A. That is an outcome that occurred. It was not initiated by EPA.

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Q. So the kidney slides were resectioned and reevaluated; correct?
A. Monsanto took it upon themselves to do it and was hopeful that that would reopen the consideration of the renal tubular adenomas in the mouse study.
Q. The agency also convened a scientific advisory panel to evaluate the study; correct?
A. Actually a couple of them, but yes.
Q. And so over this period of time, which spanned from roughly 1983 through 1986, is it fair to say that EPA engaged multiple experts to review this study?
A. No. No. Monsanto did. Monsanto convened several consultants to support its arguments to the agency, but the number of people inside EPA that looked at the study, that didn't change much. It was Lacayo and Reto Engler and Kasza, the pathologist, and Dykstra. They were -- and Farber, of course, was the deputy, the head of the division. That cast of characters didn't change much in the five-year period.
Q. Would you agree with me that EPA as a body devoted a tremendous amount of time and attention to this single study?
MR. KRISTAL: Objection.
A. Absolutely.
Q. Do you contend that Monsanto made any material

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misrepresentation to the agency in connection with the 1983 mouse study?
A. What do you mean by "material"?
Q. Let me take out the word "material." Do you contend that Monsanto misrepresented any fact to the agency in connection with that 1983 mouse study?
A. Well, yeah, they did some.
Q. What did they misrepresent?
A. They clearly -- in Frank Serdy's letter back to I can't remember if it was Doug Campt, but one of the officials in the chain of command, he represented that all of the consulting experts that Monsanto invited to the SAP meeting testified that there was no basis or justification to do a repeat mouse study, when none of them said anything about that.
Q. Other than that incident that you just referred to, can you think of any other misrepresentation that Monsanto made to the agency in connection with the 1983 mouse study?
A. I think it's fair to say that Monsanto often provided EPA with information that deviated from what the agency had actually requested. It was sort of in addition to and not fully responsive, but I don't think that would rise to the threshold that you've embedded in your question of purposely misleading.

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Q. So other than the statement that you referred to about -- strike that.

So other than Frank Serdy's statement about what various members of the SAP testified, you're not aware of any misrepresentation by Monsanto in connection with this mouse study; correct?

A. I think the -- the word "misrepresentation" is a fluid one, and I think the zeal with which Monsanto always represented information about this 1983 mouse study to the EPA was so consistently biased in favor of and in the direction of Monsanto's read of the study and hoped for evaluation of the study by -- by EPA that I think it could be characterized as really getting into the misrepresentation category.

Q. You would agree with me that it's not unusual for registrants to communicate with EPA about a particular study; correct?

A. No, it's -- it's common.

Q. It's also common that registrants would try to persuade the agency that their interpretation of the data was correct?

A. That is also common.

Q. And are you contending today that trying to persuade the agency amounts to misrepresentation?

A. It depends on how far it goes and what tactics

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are used and how -- how willing the registrant is to respond to the request for information that the agency provides to them along the way.

Another example would be literally on the day that Monsanto found out that Dykstra's review of the Bio/dynamic study was going to identify oncogenic potential because of the renal tubular adenomas, Dr. Gingerich, who was one of the scientists working in the Washington office of Monsanto, had at least two meetings and I think two phone calls with senior officials in OPP on the very day that he heard about it.

And in his conversation with Bill Burnham, who at the time, I believe, was the deputy director of HED, Burnham said, "Well you could provide us additional data on historical controls from the same laboratory and around the same period of time."

And, you know, this is -- to me it was sort of extraordinary that on the very day that Monsanto found out about this -- this pending EPA review and conclusion based on the study, that they -- that they had had these conversations.

But when Monsanto, five or six months later, submitted historical control data to the EPA in response to Dr. Burnham's request, it included data from other labs and data from outside the time period that had been

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identified.

So it's an example of where Monsanto really didn't do what EPA asked it to do and sort of muddied the water by including historical control data from other labs, which basically EPA wasn't going to pay much attention to anyway.

Q. But you don't contend that Monsanto manipulated or misrepresented the historical control data; correct?

A. No, didn't say that.

Q. And my question to you is whether Monsanto misrepresented any fact, and so far I haven't heard one that they've misrepresented, but correct me if that's wrong.

MR. KRISTAL: Objection to the form of the question.

A. I've already discussed the one example in the record that I would -- where there is clear evidence that Monsanto did misrepresent facts.

Q. So you would agree that other than that one example, there's not clear evidence that Monsanto misrepresented a fact; correct?

A. There's not clear evidence that I've had a chance to review yet. I would certainly not sit here and say that there isn't clear evidence in the record.

Q. Let's turn to paragraph 320 of your report.

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And in this paragraph you describe that Monsanto in the April through May 1985 period --

A. Yes.

Q. And again, I'm going to ask you a very specific question, so I'm just going to set this up, if that's okay.

So in April, May, 1985, Monsanto hired Dr. Kuschner, an outside pathologist, to review the kidney slides and he found an additional kidney tumor in the control group; correct?

A. Correct.

Q. And Monsanto submitted that report to OPP; correct?

A. Let's see. I think the report -- I can't remember if it went from Bio/dynamics directly into EPA, or from Bio/dynamics to Monsanto and EPA, but it was one of those two.

Q. At some point the report was submitted to EPA?

A. Yes. Yes, it was.

Q. In paragraph 323, you state that, "The Kuschner report delayed EPA's final determination as to glyphosate oncogenicity in the Bio/dynamic study"; correct?

A. I'm sorry. Where are you reading from?

Q. Paragraph 323.

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A. 323. Okay. Yes. Okay. I'm there.
Q. So as of May 1985, EPA had not yet made its final determination as to whether the Bio/dynamic study showed that glyphosate was oncogenic; correct?
A. Well, the review of Dykstra and the position taken by the CARC was it was still being discussed. They had -- they had reached the decision to classify glyphosate as a possible oncogen, but they were still discussing these aspects of the study with Monsanto.
Q. You state in your report that the Kuschner report delayed EPA's final determination; correct?
A. Correct.
Q. So as of May 1985 when that report was submitted, EPA had not yet made its final determination?
A. Distinction between in the context of this -- this whole discussion, there's an OPP determination and there's an EPA determination. OPP had made its determination via the hazard evaluation division and Dykstra's review. I believe at this time the CARC memo, which had been signed by now; right? I'm pretty sure. That represented OPP's position, but there had been no action taken at the EPA level of whether EPA management accepted that OPP decision.
So it's a little -- it's confusing, and I assure you for someone that's spent as much time with

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the record as I have, it's sometimes hard to tell what's an EPA decision or what's an OPP decision.
Q. Is there any other branch within EPA that regulates pesticides other than OPP?
A. No.
Q. So OPP's decision is the decision of EPA; no?
A. No, it's not. No, it's not. Senior-level management in EPA will sometimes overrule an action taken by OPP. In fact, they -- this was part of what happened in the case of glyphosate.
Q. When EPA reregistered glyphosate in 1993, would that be an EPA action?
A. Yes.
Q. You would agree that that was a major regulatory action; correct?
A. Yes, sir.
MR. FAYNE: I'm going to mark as Exhibit 14 the 1993 Registration Eligibility Decision.
(Exhibit 14 marked for identification.)
Q. (BY MR. FAYNE:) If you could turn to -- strike that.
You've seen this document before; correct?
A. Yes, sir.
Q. You're familiar with it?
A. Yes.

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Q. If you could turn to page 14, please.
A. First word, "Adenomas"?
Q. Correct. And if you go to the second paragraph, it's describing a carcinogenicity study in mice; correct?
A. Let me just get a sense of the context here. I take it this is in the toxicology discussion section?
Q. That's correct.
A. Estimate usage, science assessment, product chemistry...
Okay. So you --
Q. That second paragraph is discussing the 1983 mouse study; correct?
MR. KRISTAL: Which paragraph?
THE WITNESS: The second one. Starting, "A carcinogenic study"; correct?
MR. FAYNE: Correct.
THE WITNESS: Yes, okay. Correct.
Q. (BY MR. FAYNE:) So you agree that this second paragraph is discussing the 1983 mouse study; correct?
A. Correct.
Q. And at the bottom of this paragraph, the document states that, "Therefore, glyphosate was not considered to be carcinogenic in this study"; correct?
A. Correct.

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Q. So EPA's final determination was that glyphosate was not carcinogenic in this study; correct?
A. That says it's stated here, and of course this occurred in 1991 with the reevaluation.
Q. And we'll get to the 1991 reevaluation.
A. Okay.
Q. But I thought you were making a distinction between EPA and OPP. Are you saying that the 1991 reevaluation was also EPA's determination, as opposed to OPP?
A. No.
Q. So this 1993 document, this is EPA's determination; correct?
A. This is -- yeah. This is a -- this would reflect EPA's position and judgment.
Q. So as of 1993, EPA did not consider glyphosate to be carcinogenic in the 1983 mouse study?
A. Correct.
Q. You would agree with me that EPA has confirmed that conclusion on multiple occasions since 1993; correct?
MR. KRISTAL: Object to the form of the question.
A. Well, there have been -- there have been a number of tolerance petitions where EPA has discussed

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the chronic toxicology database, and then there's been all of the documents relative to the rereview of glyphosate that started in, what, 2008 culminating in the 2016 report being the fullest expression, and at multiple times along the way, the EPA expressed its judgment based on the entire animal bioassay data set.

And I really don't believe there was anything new or different said about the 1983 Bio/dynamic study from 1991 on. I mean, that was it. That was the end of the story on that study.

Q. So since 1991, EPA's position on the 1983 study has been consistent; correct?

A. Has been consistent, yes.

Q. And consistently found that it did not show carcinogenicity; correct?

A. Well, they -- that's what they determined in 1991, and they never revisited that decision or changed it.

Q. So your position is that during the current rereview process, culminating in what you said was the 2016 EPA report, but that's been updated since in December 2017, that EPA didn't revisit that study?

A. No. No. I don't think they did at all, yeah.

Q. What's your basis for saying that they haven't looked back at the study?

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A. They had a final determination of that study, and I don't think they -- they spent a lot of time reassessing their evaluation of many of the old animal bioassays. So I think to the extent that they spent time assessing new studies, it would be the more recent ones.

Q. Did EPA -- I'm sorry. Strike that.

Did IARC consider the 1990 -- 1983 mouse study?

A. Yes.

Q. Did it reach any determination about that study?

A. Yes.

Q. Did it find that the tumors in the study were treatment-related?

A. Yes.

Q. You agree that in its most recent evaluation in December 2017, OPP has reviewed the IARC report; correct?

A. Yes.

Q. And that would include the IARC -- the section of that report addressing the 1983 mouse study; correct?

A. Correct. Yeah.

Q. And in the December 2017 OPP report, EPA again found that glyphosate is not likely to be carcinogenic; correct?

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A. Correct.

Q. It also conducted a review of the animal data; correct?

A. Well, yeah. It reviews the same studies that it reviewed, and going back to the 1993 reregistration document, yeah.

Q. So in the December 2017 report, EPA had reviewed the IARC determination, had reviewed IARC's conclusions about the animal data, and still reached the determination that glyphosate is not likely carcinogenic; fair?

A. OPP had reviewed, not all of the EPA, because there was a disagreement in EPA about the aspects of the evaluation.

Q. OPP had reviewed the IARC determination, IARC's conclusions about the animal data, and reached the determination that glyphosate is not likely to be carcinogenic; correct?

A. EPA reached that conclusion based on a weight-of-the-evidence assessment relative to the five categories in EPA's classification system.

You know, there's -- certainly there are differences in the evaluation of the animal data between EPA and IARC, but certainly not as significant as the differences in assessment of the genotox database.

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Q. Sir, if you could turn to page 85 of Exhibit 6, which is EPA's --

A. Yep. Yep.

Q. -- 2016 --

A. 85?

Q. 85, yes.

A. Okay. I'm there.

Q. This is OPP's discussion of the 1983 mouse study; correct?

A. Correct.

Q. And this is their -- OPP's 2016 report which follows the IARC evaluation; correct?

A. Follows?

Q. Sorry, came after IARC's determination; correct?

A. Well, I'll -- yes. Yes.

Q. And if you turn to page 87, the --

A. I'm there.

Q. The top paragraph states, "Based on the weight of evidence for this study, the agency concurs with the PWG conclusion, following a thorough examination of all kidney sections, that the renal tubular neoplasms are not treatment-related with a lack of statistical significance in the trend and pairwise test"; correct?

A. Correct.

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Q. So in 2016, EPA concluded, based on a weight-of-evidence evaluation of this study, that the tumors were not treatment related; correct?
A. That -- that was EPA's position then and I believe it's still to this day.
Q. I'd like to go to -- you can put that down now. Thanks.
A. I was going to say, no more than three documents open at once.
Q. Yes, I understand.
A. Or we'll get hopelessly --
Q. Let's turn to page 78 of your report.
A. Are we done with this '93 R.E.D.?
Q. Yes. You can put that away.
A. Okay. Where are we going in my report?
Q. So you don't even need to turn there, actually.
In your report you discuss the 1986 scientific advisory panel; correct?
A. Yes.
Q. Which reviewed the 1983 mouse study?
A. Correct.
Q. What is a science advisory panel?
A. It's an ad hoc group of scientists convened by EPA to provide scientific and technical guidance to the agency on issues that arise in the course of regulating

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pesticides.
Q. And an S-A-P, or science advisory panel, is composed of scientists who are independent of EPA; correct?
A. Correct.
Q. They're selected by EPA's Office of Science Policy?
A. Yes.
Q. The 1986 SAP memorialized its findings and recommendations in a February 24th, 1986, memo; correct?
A. Correct.
(Exhibit 15 marked for identification.)
Q. (BY MR. FAYNE:) Marking as Exhibit 15 the SAP's 1986 memo. You've seen this document before?
A. Yes, but I need to read it.
Q. And I just have a very quick question for you about what the panel concluded.
A. Okay. Just let me finish reading it, please. Okay.
Q. In this 1986 SAP memo, the SAP recommended that glyphosate be categorized -- categorized as Group D, not classifiable; correct?
A. Correct.
Q. So the SAP did not believe there was sufficient evidence to classify glyphosate as a possible oncogen;

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correct?
A. Correct.
Q. The SAP also recommended that there be a data call-in for further studies in rats and/or mice --
A. Correct.
Q. -- to clarify unresolved questions; correct?
A. Yes.
Q. And you testified previously that Monsanto did conduct a new study in rats; correct?
A. There was a new study ongoing at the time of this meeting.
Q. But since 1986, Monsanto did -- strike that.
After the 1986 SAP, Monsanto did complete a new study in rats; correct?
A. They completed it and submitted it to the agency, yes.
Q. And that's the Stout and Rucker study?
A. I don't recall the author's name.
(Exhibit 16 marked for identification.)
Q. (BY MR. FAYNE:) We've marked as Exhibit 16 an EPA memorandum dated October 30th, 1991, subject "Second peer review of glyphosate."
You've seen this document before; correct?
A. Yes, sir.
Q. This document is titled "Second peer review."

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The first was the March 1985 memo you mentioned previously; correct?
A. Correct.
Q. If you turn to page -- the second page of the document, it states individuals in attendance; correct?
A. Yes.
Q. And there are a number of individuals listed here. I haven't counted them up, but it looks like more than ten individuals on the committee; correct?
A. Yes.
Q. And at the top it states that signature indicates concurrence with the peer-review committee -- I'm sorry, strike that.
It states, "Signature indicates concurrence with the peer review unless otherwise stated"; correct?
A. Yes.
Q. So on this document and others like it, the signature indicates concurrence; correct?
A. Correct.
Q. Unless something else is indicated on the signature line; correct?
A. Correct.
Q. And as you can see from this report, the majority of members of the committee concurred in the peer review; correct?

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A. Correct.
Q. Can you turn to page 5. There's a study, Stout and Rucker study dated 1990, "Chronic study of glyphosate administered in feed to albino rats"; correct?
A. Correct.
Q. And that's the -- that's the 1990 study that Monsanto completed; correct?
A. Correct. That probably was underway in 1986.
Q. So this shows that EPA reviewed the 1990 rat study; correct?
A. Right. I assume this is a summary of the review.
Q. And if you turn to page 13 --
A. I'm there.
Q. Number 3, that's the 1983 mouse study; correct?
A. I'm sorry, page?
Q. Sorry. On page 13, where it says --
A. Okay. Yep.
Q. -- "Hogan, GK" --
A. Yes.
Q. "1983."
A. Yes. Yes.
Q. So EPA also reviewed the 1983 mouse study in this 1991 peer review; correct?

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A. It was included, yes.
Q. And they state on page 14, if you turn to page 14, the third paragraph states, "Committee's interpretation. In their meeting of June 26, 1991, the health effects carcinogenicity peer-review committee concluded that despite the fact that the incidence of renal tubular neoplasm in the high-dose males exceeded that of historical controls, the biological significance of the findings was questionable."
Did I read that correctly?
A. Yes.
Q. And then the peer-review committee cites a number of reasons why they thought the review was questionable -- the findings were questionable; is that fair?
A. That's correct.
Q. Finally, if you turn to page 19 --
A. I'm there.
Q. -- it states the peer-review committee's classification that glyphosate should be classified as a Group E (evidence of non-carcinogenicity for humans), based on lack of convincing carcinogenicity evidence and adequate studies in two animal species; correct?
A. Correct.
Q. So in 1991, EPA reviewed the 1990 rat study,

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reviewed the 1993 mouse study, and concluded that glyphosate should be classified as non-carcinogenic to humans; correct?
A. That's correct.
Q. Your report details at length the events from 1983 related to this 1983 mouse study up through the end of the 1980s; correct?
A. Correct.
Q. You don't mention that Monsanto performed a study in rats, do you?
A. No.
Q. Why not?
A. There was no -- no disagreement or controversy over the interpretation of that study. The EPA scientists reviewed and reached the same conclusions as the Monsanto scientists in the contract lab.
Q. In forming your opinions in this case, did you consider the fact that Monsanto performed the rat study as requested by the SAP?
A. I believe the rat study was started before the SAP meeting.
Q. But the SAP stated that there should be a new study --
A. Right.
Q. -- in mice and/or rats; correct?

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A. Yeah.
Q. And Monsanto performed the study in rats; correct?
A. Yeah. It was ongoing and they completed it, yeah.
Q. Did you consider that fact in forming your opinions in this case?
A. Yes.
Q. But you didn't consider it important enough to include in your expert report; is that correct?
MR. KRISTAL: Objection.
A. No, I didn't.
Q. Your report also does not mention the 1991 peer review; correct?
A. I'd have to go back and look if it did, but it's certainly a part of the record that I've testified to at length in the earlier depositions.
Q. You would agree with me that the 1991 peer review is an important piece of the regulatory history; correct?
A. Yes.
Q. Okay. So I want to now move to a discussion of the request for a repeat mouse study, which we've talked about a little already; correct?
So you state in your report that in 1986, EPA

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issued the registration standard document; correct?
A. Yes.
Q. And in that document, EPA concluded that the available data were not sufficient to adequately assess whether glyphosate was carcinogenic; correct?
A. Correct.
Q. And EPA requested a repeat of the mouse study with a larger number of animals in each test group; correct?
A. And a rat study.
Q. And a -- but -- sure. But I'm speaking specifically about the mouse study. Correct?
A. Okay. All right.
Q. And you testified that they did do the rat study; correct?
A. Right. Right.
Q. Monsanto formally requested a waiver, as I understand it from your report; correct?
A. Uh-huh.
Q. If you could say "yes" or "no."
A. Yes.
Q. And it's not uncommon for a registrant to submit a waiver request; correct?
A. No. It happens.
Q. And in some cases, the agency agrees; in some

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cases it might not agree. Correct?
A. That's also correct.
Q. In paragraph -- actually, strike that.
You also describe a memo that was prepared by Dr. William Dykstra; correct? And this is the -- sorry. Strike that again.
You also describe a memo from Dr. William Dykstra in which he states that, "The toxicology branch does not concur with Monsanto regarding the waiver of the repeat mouse study"; correct?
A. Correct.
Q. That memo was prepared in 1990 -- 1988; correct?
A. I believe that's correct. Can you just direct me to the paragraph?
Q. Sure. It's paragraph 380.
A. 380, okay.
Q. And actually, if you go to 384, you note that Dr. Dykstra set forth several specific study requirements, including that there should be 200 male mice per group; correct?
A. That was one of them, yes.
Q. So that would be 400 male mice total; correct?
A. No. No. There were several groups. There was a control group and five treatment groups as opposed to

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only three, so it would be 1,200 male mice.
Q. So the study that Dr. Dykstra was requesting would be 1,200 male mice?
A. Correct.
Q. How many mice are typically included in a long-term cancer study?
A. Well, in the original 1983 Bio/dynamic study, there was 50 mice in each of the control and three treatment groups, so 200 male mice, 200 female mice, so a total of 400.
Q. So this would be three times as large as the typical study?
A. Yes.
Q. Are you aware of any pesticide company that has performed a long-term cancer study using that many mice?
A. No, not off the top of my head. It would be a very -- it would be a very unusual study, a very powerful study that, if there were indeed a problem with renal tube adenomas, that study would have resolved it.
Q. And you've referred to this as a special study --
A. Yeah.
Q. -- because it's unusual; correct?
A. Right.
Q. And you discuss this memo from Dr. Dykstra in

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1988 because it's, in your view, an important piece of the regulatory history; fair?
A. Correct.
Q. So if I understand your report correctly, EPA requested that Monsanto perform this more powerful mouse study in the 1986 registration standard document, and then --
A. No. No, they didn't -- the request for that more powerful study, I don't believe it was in the registration standard document. It occurred -- it, you know, two years later in the back-and-forth, after the resectioning of the kidney slides and after the controversy over the magic tumor in control mouse 102A.
Q. So in the registration standard document, EPA requested a repeat mouse study; correct?
A. A repeat mouse study.
Q. Correct. So EPA requested the repeat mouse study, and then denied Monsanto's request for a waiver in 1988; correct?
A. Correct. Well, I don't know the date that they denied the waiver, but in between the issuance of the registration standard and Dykstra's request for this special study, there had been the resectioning of the slides and the controversy over whether there was an additional renal tubular adenoma in one of the control

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mice.
And OPP and Dykstra felt that the way to resolve this very sharp difference of opinion with the three EPA pathologists that read all the slides saying there's no renal tubular adenoma in control mouse 102A, and all of the Monsanto-hired pathologists saying that there was -- one of the two had to be wrong.
And I think it's fair to say that there was never agreement between OPP and Monsanto about whether there was in fact a renal tubular adenoma in control mouse 102A, so EPA designed this very powerful study that had Monsanto done the study and had it produced no evidence of kidney tumors, the debate over the 1983 study would have ended at that point.
MR. FAYNE: I'm going to move to strike that answer as non-responsive.
MR. KRISTAL: I think it was completely responsive, and I'd also remind counsel we're beating dead mice at this point, too.
Dr. Benbrook has been asked ad nauseam about this study, and you're really repeating a lot of the same -- it's the same report and you're repeating a lot of the same questions.
MR. FAYNE: This is a new report, and I'm walking through it paragraph by paragraph.

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MR. KRISTAL: No. No. I understand it's a new report. The same information was contained in the old report. The same information has been asked --
THE WITNESS: Counsel, you didn't do any of the last deposition. I was there, and I will tell you this is very similar to what we went through.
MR. FAYNE: I understand.
MR. KRISTAL: All I'm saying is I gave you some leeway. I just ask you not to repeat questions on the exact same subjects asking and showing the same documents.
MR. FAYNE: I'm trying to understand his opinions that are set forth in this new report.
MR. KRISTAL: And I would suggest you look at any one of the five.
MR. FAYNE: I've reviewed all five.
MR. KRISTAL: And including all five of them --
MR. FAYNE: I appreciate it.
MR. KRISTAL: -- and you'd understand exactly what you're asking because it's already been asked.
MR. FAYNE: Okay. Thank you. I appreciate that.
Q. (BY MR. FAYNE:) If you could turn to paragraph 368 of your report.
A. We're going -- we're going back now? 368?

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Q. 368.
A. Okay. I'm there.
Q. You state that, "The 1986 glyphosate RS document states on page 2: 'Failure to comply with these requirements [example, filling data gaps, adding new worker safety rules] may result in the issuance of a Notice of Intent to Cancel or a Notice of Intent to Suspend in the case of failure to submit data."
Did I read that correctly?
A. Yes, you did.
Q. You just testified that Monsanto never conducted the repeat mouse study that EPA requested in the 1986 registration center document; correct?
A. Yes.
Q. But EPA never issued a notice of intent to cancel the glyphosate registration because of Monsanto's failure to do so; correct?
A. That is correct.
Q. EPA never issued a notice of intent to suspend; correct?
A. Correct.
Q. And one more question. If I could turn you back to the 1991 peer review. And I apologize, I don't -- which exhibit is that?
A. Exhibit 16.

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Q. Exhibit 16. You testified previously that your understanding is that EPA did not request the additional kidney sections; correct?
A. There were -- there were two rounds of reassessment of the kidney slides.
Q. But I believe your testimony previously was that EPA did not request that resectioning.
A. Correct.
Q. If you turn to page 13 of this document.
A. I'm there.
Q. The last paragraph, the first sentence, states, "The agency then requested that additional kidney sections from the mouse study be prepared and examined."
Do you see that?
A. Yes.
Q. Would you agree with me, then, that your prior testimony was --
A. No.
Q. -- incorrect?
A. So there were two rounds of this, as I said. The first rereading of the kidney slides was actually rereading the original slides. The second round of reassessment entailed actually resectioning the slides, and that -- that is what is addressed in this passage.
Q. So you would agree the EPA requested the

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resectioning of the slides; correct?
A. The resectioning of the slides was proposed originally by Monsanto in their ongoing back-and-forth, and ultimately EPA decided to request the resectioning of slides because that -- you know, they had to unthaw the kidneys and slice them again, so it required a request to do that.
MR. FAYNE: 17.
(Exhibit 17 marked for identification.)
Q. (BY MR. FAYNE:) I've marked as Exhibit 17 a June 1989 memo from EPA prepared by William Dykstra, subject, "Glyphosate EPA Registration Numbers 524-318 and 524-333 - Historical Control Data For Mouse Kidney Tumors."
Do you see that?
A. Yes.
Q. Have you seen this document before?
A. Yes.
Q. This is a memo from Dr. Dykstra dated June 1989, which is approximately one year after the Dykstra memo we discussed previously; correct?
A. Correct.
Q. And if you turn to page 2 of the document, the last paragraph before the section that says "Background."

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A. Okay.
Q. It states that TB -- and "TB" stands for the toxicology branch; correct?
A. Correct.
Q. "The toxicology branch concludes that a repeat of the mouse oncogenicity study is not required at this time. After the results of the new two-year rat chronic toxicity and oncogenicity study are reviewed, toxicology branch will reconsider whether the repeat of the mouse oncogenicity study is required."
Did I read that correctly?
A. Yes, you did.
Q. So in 1989, the EPA toxicology branch agreed that Monsanto did not have to conduct the repeat mouse study; correct?
A. At this time.
Q. At this time; correct?
A. Correct.
Q. EPA further explained that after the results of the rat study were reviewed, it would consider whether to request that repeat mouse study; correct?
A. Yes, sir.
Q. And as we discussed previously, Monsanto did complete that new rat study, and EPA reviewed it in 1991; correct?

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A. Yes, sir.
Q. Do you know whether EPA ever requested that Monsanto repeat the mouse study after 1991?
A. I don't believe they did.
Q. So you stated earlier that at this time, but to your knowledge EPA has not requested that repeat study since 1989; correct?
A. Correct.
Q. You state in your report that Monsanto's refusal to conduct that new repeat mouse study altered the regulatory history; correct?
A. Yes.
Q. You're aware that since the early '90s, there have been four new studies in mice; correct?
A. Yes.
Q. Do you know whether any of those studies found compound related kidney tumors like those reported in the 1983 study?
A. I'd have to refresh my memory, but there's a number of tumors identified in the mice and rat studies that -- where there's difference of opinion between different entities. IARC read them differently in some respects than EPA. There were, I think, maybe 14 different tumors that are where the results are subject to controversy, depending upon who's reviewing the

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study.
Q. But you're not aware of any of those studies that found compound related kidney tumors; correct?
A. I'm not aware of any that found renal tubular adenomas of the same sort that were in the CD-1 mice in 1983, but I do believe the kidney -- the kidney was a target of other adenomas and carcinomas in some of the other studies, and in particular the -- it was the -- a Syngenta study.
Q. You mentioned that there have been many studies in mice and rats since the early '90s; correct?
A. Well, I think the total count is 14.
Q. Correct. There have been 14 --
A. Yeah.
Q. -- long-term studies in rodents; correct?
A. Yeah. I think that's the number most people agree to.
Q. EPA has reviewed all 14 of those studies as recently as December 2017?
A. Well, they're discussed in the December 2017 report. They're discussed in the September 2016 report and all the earlier reports, yeah.
Q. And again, since 1991, EPA has consistently classified glyphosate as not likely to be carcinogenic; correct?

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MR. KRISTAL: Asked and answered.
A. Yeah, it's glyphosate technical based on expected levels of exposure to the general public.
MR. FAYNE: Is now a good time for a break?
THE WITNESS: I'm ready for a bio.
VIDEOGRAPHER: Off the record at 2:57 p.m.
(A brief recess was had.)
(Exhibit 18 marked for identification.)
VIDEOGRAPHER: Back on the record at 3:19 p.m.
Q. (BY MR. FAYNE:) Dr. Benbrook, I'm marking as Exhibit 18 the October 1st, 2015, EPA report of the Cancer Assessment Review Committee.
A. Okay.
Q. You've seen this document before; correct?
A. Yes.
Q. The Cancer Assessment Review Committee, or CARC, is a team of interdisciplinary EPA scientists with specific expertise in cancer classification; agree?
A. That's correct.
Q. The CARC must review all food-use pesticides for their carcinogenic potential; correct?
A. I'm not sure that all pesticides come before CARC, but they -- certainly all of the ones where there are technical issues that need to be resolved.
Q. And the CARC recommends a cancer classification

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that ultimately OPP decides whether or not to adopt; correct?
A. That's correct.
Q. If you turn to page 10.
A. I'm there.
Q. The middle paragraph before the bullet states, "In accordance with the 2005 Guidelines For Carcinogenic Risk Assessment, based on the weight-of-evidence, glyphosate is classified as 'Not Likely to Be Carcinogenic to Humans.'"
Did I read that correctly?
A. Yes, you did.
Q. So in 2015, as we discussed, the Cancer Assessment Review Committee classified glyphosate as non-carcinogenic; correct?
A. Yes.
Q. If you turn to page 6, it lists the committee members in attendance.
A. I remember seeing the list. Yes, I see it.
Q. And it shows that there were 13 members of the committee; correct?
A. Yes.
Q. And --
A. I didn't count them, but I'll take your word for it.

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Q. I'll represent to you that it's 13.
A. Okay.
Q. And each of the members signed; correct?
A. Yes.
Q. None of them indicated they did not concur in the decision; correct?
A. That's correct.
Q. So that means all 13 members of the committee concurred with the classification of glyphosate as not likely to be carcinogenic to humans?
A. Yes.
Q. And I'll note that you testified in August that you thought that maybe not all 13 had concurred, but you now agree that you were not remembering correctly in August; correct?
A. Perhaps we were addressing the 1991. You know, I don't -- I don't know what part of the deposition you're referring to.
Q. Sure.
A. But I could have gotten one wrong.
Q. But we agree today that --
A. Today.
Q. -- all 13 concur?
A. We are on the same page, sir.
Q. Great. So turning to -- now I'm in your

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IA -- you can put that aside.
A. Back to the report?
Q. Back to the report. Paragraph 387. It's on page 86.
A. I'm there. 387?
Q. You know what? I'm sorry. Could we actually pull out the CARC report again? I'm sorry.
A. This last one?
Q. Yes.
A. Okay.
Q. So you've testified in your report about Jess Rowland; correct?
A. Correct.
Q. And you suggested or you assert in your report that Jess Rowland's involvement with the CARC calls into question its objectivity. Is that a fair characterization?
A. Not exactly. The record shows some unusually close and inappropriate communications between Jess Rowland and Monsanto on the general topic of OPP's evaluation of glyphosate oncogenicity.
Q. You state in paragraph 463 -- if you want to turn there in your report.
A. 463?
Q. Yep.

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A. 460. Going the wrong direction. Okay. I'm there.
Q. The second sentence of that paragraph you state, "Considering Dr. Rowland" -- I think that should probably be "Dr. Rowland's relationship with Monsanto, it raises, in my opinion, serious questions about the objectivity of that report and the scientific basis of EPA's determination that glyphosate is not likely to pose cancer risk."
Do you see that?
A. Correct.
Q. And you're referring to the CARC assessment?
A. Correct.
Q. Do you have any reason to believe that the 12 other members of this committee were biased in any way?
A. I found very curious and suggestive an e-mail that Jess Rowland sent to one of the Monsanto people where the topic of discussion was Monsanto had contacted Rowland to see if Rowland and EPA needed any support from Monsanto in sticking to its position that glyphosate poses no oncogenic risk after the release of the IARC classification as a probable human carcinogen.
And in the response from Rowland to -- I believe it was Serdy. I can't remember. We can no doubt find the MONGLY document, if you want. Rowland

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says that he's in good shape on epi and exposure, there is an issue about a carcinoma in I believe it was the Syngenta oncogenic feeding study, and he says -- he says that he identifies the CARC as "my people."
And that tipped me off to the -- to perhaps an undue influence by Rowland on the members of CARC in that he felt that they were his people and hence would follow his lead.
Q. So you reviewed the e-mails between Jess Rowland and Monsanto and those e-mails led you to question the objectivity of the CARC; is that fair?
A. It suggested to me that there was a Jess Rowland-led effort to try to assure that EPA's statements and reports on the matter of glyphosate oncogenicity stuck to the decision that really went back to 1991, that glyphosate poses no oncogenic risk to humans.
Q. You're not aware of any communications from any of the other non-Rowland members of the CARC and Monsanto; correct?
A. Let me -- no, I'm not.
Q. Each member of the CARC has equal voting rights; correct?
A. I believe that's the case.
Q. And in this case, the vote on glyphosate in

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2015 was unanimous, as we discussed; correct?
A. Correct.
Q. Now let's go to paragraph 387 of your report.
A. 387?
Q. Yes. And just to orient you, this is --
A. Okay. I'm there.
Q. And to orient you, this is the last paragraph of your discussion of the 1983 mouse study.
A. Oh, okay. Thank you.
Q. You state, "In my opinion Monsanto should have conducted a special study requested by EPA in response to the agency's request, and in light of the company's commitment to product safety. I also conclude that, and in the interim, Monsanto should have added an oncogenicity warning to Roundup labels as well as in glyphosate-based herbicide chemical safety data sheets and other information developed for physicians and poison control centers."
I omitted a parenthetical, but otherwise did I read that correctly?
A. Yes, you did.
Q. So you state that Monsanto should have added an oncogenicity warning in the interim; correct?
A. Correct.
Q. And by "in the interim," do you mean the period

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of time between the 1986 registration standard document and Monsanto's completion of the repeat mouse study?
A. Well, I think that a prudent company would have moved to add such a warning following the initial CARC classification that occurred I believe in 1985, and that that's when it should have -- it should have been initiated. It takes time to add that sort of language to all the labels.
It wouldn't have happened until probably 1987, at the earliest, given the cycle of label, but that's when it should have begun.
Q. And the reason you contend they should have done that is because at that time, EPA in 1985 had determined that it was a possible carcinogen; correct?
A. Correct.
Q. And then in 1986, EPA had determined that it was a class Category D carcinogen, not classifiable; correct?
A. Now, 1991.
Q. The 1986 registration standard document adopts the Category D classification; correct?
A. I don't believe so.
Q. Regardless, your position as of -- let's start with 1985. The reason you contend Monsanto should have added the warning is because of EPA's classification of

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glyphosate as a possible carcinogen; correct?
A. As codified in the 1985 CARC meeting.
Q. So by that logic, would you agree that today Monsanto has no obligation to put a cancer warning on its products based on EPA's classification of glyphosate as Category E, non-carcinogenic?
MR. KRISTAL: Objection. Because Dr. Benbrook is not being offered on causation, and, therefore, there's additional information in the present time other than EPA's classification.
MR. FAYNE: You can answer.
THE WITNESS: Would you please repeat the question?
Q. (BY MR. FAYNE:) Sure. By that logic, would you agree that Monsanto has no obligation today to place a cancer warning on its glyphosate-based herbicides in light of EPA's classification of glyphosate as not likely to be carcinogenic?
A. No, I don't agree. There's much more information and there is a classification by the International Agency For Research on Cancer that glyphosate and glyphosate-based herbicides are probable human carcinogens, which I think raises substantially the justification for a clear cancer warning on labels and material safety data sheets, et cetera.

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Q. Would you agree that prior to the IARC determination in March 2015, that Monsanto had no obligation to put a cancer warning on its products based on the then existing EPA classification of glyphosate as Category E, non-carcinogenic?
MR. KRISTAL: Same objection. And he's already been questioned about this.
THE WITNESS: May I answer?
MR. KRISTAL: Sure.
THE WITNESS: I don't believe that Monsanto had a legal obligation under FIFRA.
I do believe that they had a moral and ethical obligation as a company with a professed commitment to product stewardship and safety of its users. Given -- given the equivocal oncogenic response data in a number of the animal bioassays, in addition to the positive epidemiological studies that Monsanto was aware of at the time, a responsible company would have alerted its users that there is some chance, some evidence that there may be an oncogenic risk, and I think it was incumbent on the company, by virtue of its stated commitment to product stewardship and its pledge to promote the safe use of its products, to provide users with that information.
Q. (BY MR. FAYNE:) So your opinion is that

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Monsanto did not have a legal obligation to add a cancer warning to its label, but it had a moral one; is that fair?
MR. KRISTAL: Objection. Obviously calls for a legal conclusion.
A. I didn't say "legal obligation." I said an obligation under FIFRA under the requirements that the EPA imposes. In fact, I do believe that Monsanto at some point had a legal obligation under OSHA regs to -- to accurately include the IARC classification on OSHA chemical safety data sheets or whatever they call them.
Q. Let me -- let me be more clear, then. You do not believe that Monsanto has a legal obligation under FIFRA to put a cancer warning on its product labels; correct?
MR. KRISTAL: Objection. Calls for a legal conclusion.
A. I would agree that there -- that there was no OPP requirement or statement of an obligation during this post-1991 period to add a cancer warning on the labels.
Q. You would agree that the 1986 registration standard document did not impose on registrants of glyphosate-based herbicides a requirement to place a

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cancer warning on the product labels; correct?
A. Correct.
MR. KRISTAL: Objection. Calls for a legal conclusion.
Q. That document also did not impose on registrants a requirement to place an oncogenicity warning on the product labels; correct?
MR. KRISTAL: Objection. Same objection.
A. Correct.
Q. EPA has never required such warnings on glyphosate-based products; correct?
A. Correct.
Q. So your position that Monsanto should have added an oncogenicity warning on Roundup labels is not based on EPA regulations; correct?
A. Correct.
MR. KRISTAL: Objection.
Q. It's based on your personal opinion about what a moral or ethical pesticide company would do?
MR. KRISTAL: Same objection.
A. It's based on what Monsanto has communicated to its user community, the medical community, regulators through various avenues in the course of describing their commitment to product stewardship.
Q. So based on what Monsanto has communicated,

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it's your personal opinion that they have a moral or ethical obligation to put a cancer warning on their products; correct?
A. Correct.
MR. KRISTAL: Object to the form of the question.
Q. You've reviewed several labels on glyphosate-based products; correct?
A. Yes.
Q. And those labels apply to the formulated product; correct?
A. Correct.
Q. As we've been talking about today, you're aware that since 1991 there have been numerous approvals of glyphosate-based formulations; correct?
A. Yes.
Q. Every time that Monsanto changes a glyphosate-based formulation, it has to submit an application to EPA to get approval of that new formulation; correct?
A. A label amendment, yes. Correct.
Q. That application for a new formulation would, of course, include any EPA-required studies on the new glyphosate-based formulation; correct?
A. If EPA felt that such a study was necessary.

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Q. You agree that each new formulation requires, at a minimum, the acute tox six-pack of studies of the product; correct?
A. Depends on how significant the changes are. There's certainly a number of changes in formulations where EPA would waive the requirement for a new six-pack.
In particular, when there's some of the antifoaming agents and some of the adjuvants that have been altered as opposed to the surfactants where there was greater concern about some impact on the differential toxicity of the formulated product compared to the technical material.
Q. And certainly to the extent EPA required it or asked for it, those applications for approval of new glyphosate-based formulations would have to include toxicology studies supporting the new approval; correct?
A. Well, most of them didn't, and for most of them there was not a requirement for a new set of toxicology studies. There -- now, if there was a wholly-new formulation -- and by "wholly new," obviously the glyphosate technical would be the same.
Now, it might be a potassium salt versus an isopropanol salt, but EPA would only require, for example, the six-pack studies if there was a substantial

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change in the surfactant, either the mix of surfactants or the concentration of surfactants in the formulated product.
Q. You've reviewed the 2016 EPA OPP report in detail; correct?
A. Yes, sir.
Q. So you're aware that in that report, EPA discusses the IARC findings; correct?
A. Yes.
Q. EPA is certainly aware that IARC found glyphosate-based herbicides are probable carcinogens; correct?
A. Correct.
Q. That's true of the 2015 CARC report, as well; they also discuss the IARC determination. Correct?
A. I guess it had come out a couple of months before.
Q. If you could pull up the 2016 OPP report. It's Exhibit 6.
A. Yep. Got it.
Q. If you turn to page 13.
A. I'm there.
Q. The third paragraph of that section states that, "Recently, several international agencies have evaluated the carcinogenic potential of glyphosate," and

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then they go on to discuss a number of bodies that have reviewed glyphosate; correct?
A. Yes, sir.
Q. And that includes the IARC review; correct?
A. Correct.
Q. If you then go to the next paragraph, it states that, "The recent peer review performed by CARC served as an initial analysis to update the data evaluation for glyphosate at that time."
Do you see that?
A. Yes.
Q. So you would agree that CARC was the initial analysis performed by OPP on glyphosate as part of its registration review; correct?
A. Yeah, going back to 1985, actually.
Q. And then if you look at the last sentence of that paragraph, it states, "As such, the current evaluation also provides a more thorough evaluation from the 2015 CARC review."
Do you see that?
A. Yes.
Q. Would you agree that the 2016 OPP report is a more thorough evaluation than the 2015 CARC assessment?
A. In certain aspects, yes.
Q. You can put that document down for the time

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being. Thank you.
In other words, EPA doesn't have its head in the sand; correct? It's aware of what's going on throughout the world with glyphosate?
MR. KRISTAL: Objection to the form of the question.
A. If what you're asking is was the EPA aware of the conclusion reached by the IARC Working Group, absolutely, yes, they were very aware of that.
Q. And in its 2016 review, EPA considered the conclusion of the IARC Working Group; correct?
A. Yeah, both OPP and ORD, and other parts of EPA, no doubt, paid attention to that.
Q. And in its 2016 review, OPP also considered the reviews by other regulators around the world; correct?
A. I don't think they placed much weight on Canada's review and EFSA's review. They were aware of it. I think without a doubt, the evaluation of the US EPA on the matter of glyphosate oncogenicity was the most thorough and generally led the pack or was deferred to by most other regulatory agencies.
So I would say the only -- the only other assessment that would probably correctly be identified as comparably in depth would be the ones conducted by the Germans as part of the European reregistration of

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glyphosate, the BfR review.
Q. And the BfR review which informed the EFSA determination; correct?
A. Correct.
Q. And by "EFSA," that's the European Food Safety Agency?
A. Agency, yeah.
Q. You've reviewed -- we've discussed already that you've reviewed several glyphosate formulation labels; correct?
A. Yes.
Q. Have you reviewed recent labels?
A. Yes.
Q. Labels that have been issued since the 2015 IARC determination?
A. Some of them, yes.
Q. You've already testified that each label for a new glyphosate-based formulation must be approved by EPA; correct?
A. Yes.
Q. Before EPA can approve a label, it must make a determination that the glyphosate-based formulations label is consistent with FIFRA and the regulations implementing FIFRA; correct?
A. Well, that would be the -- the framework in

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which they make a judgment of whether they're going to challenge anything about a particular label or not.
Q. So under FIFRA, EPA is required to make the determination that the label is consistent with the statute and with EPA's regulations that went into the statute; correct?
A. Correct.
Q. You testified previously that in order to change the labeling for a registered pesticide, the registrant must submit it to EPA to review and approve; correct?
MR. KRISTAL: For about the tenth time.
THE WITNESS: Yes.
Q. You also testified that EPA has to approve all labeling and label changes?
MR. KRISTAL: Don't answer that question. Now you're not only repeating questions that have been asked at every other deposition, you're repeating questions that you asked earlier today.
THE WITNESS: We --
MR. KRISTAL: Don't answer that question.
THE WITNESS: I'm not going to, but...
MR. FAYNE: You're instructing the witness not to answer that question?
MR. KRISTAL: Yes, because it's now in the

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realm of harassment. We're six hours in and you're repeating questions you asked today, and you're repeating questions that have been asked at the other depositions. If you don't have any more questions, there's no --
MR. FAYNE: I've got more questions.
MR. KRISTAL: I know. Well, ask questions that aren't repetitive. I've had very few objections in this deposition.
Q. (BY MR. FAYNE:) A registrant can't make a unilateral label change except for minor adjustments to the label; correct?
A. Correct. There's a long passage in the regulations on what such minor changes that don't require a formal label amendment, and there's actually a process for noting some minor changes.
Q. So a company couldn't just take it up on its own to make a change to precautionary statements without putting that change before EPA for review and approval?
MR. KRISTAL: Don't answer that question.
A. I've answered that question 16 times.
Q. I'll take that as a --
A. No change in my response.
Q. So despite IARC's finding that glyphosate-based herbicides are a probable carcinogen, EPA has continued

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to approve the labels on glyphosate-based formulations for sale and use in the United States; correct?
A. That's correct.
Q. And it has approved labels that -- strike that.
Despite EPA's awareness and review of the IARC monograph finding that glyphosate-based herbicides are a probable carcinogen, the agency has continued to approve labels that do not include a warning about carcinogenicity; correct?
A. Correct.
Q. As of today, EPA continues to find -- strike that.
As of today, EPA continues to classify glyphosate as not likely to be carcinogenic to humans, notwithstanding IARC's finding; correct?
A. Based on typical and expected exposures for the general population, yes.
Q. So EPA's approval of the product labels on glyphosate-based formulations is consistent with its determination that glyphosate is not likely to be carcinogenic to humans; correct?
A. Yes.
MR. FAYNE: Can we go off the record for just one minute?
VIDEOGRAPHER: Off the record at 3:48 p.m.

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(A brief recess was had.)
VIDEOGRAPHER: Back on the record at 3:48 p.m.
Q. (BY MR. FAYNE:) I'd like to turn back to your report. Go to paragraph 87.
A. 87?
Q. Yes.
A. That's got to be up front.
Q. Page 26, if I get the paragraph and page right this time.
A. I'm there, sir.
Q. You say, "In my opinion, the failure of EPA to require Monsanto or any other glyphosate-based herbicide registrant, to carry out a chronic oncogenicity feeding study using a formulated glyphosate-based herbicide does not obviate the scientific importance and regulatory risk-assessment relevance of such a study."
Did I read that correctly?
A. You did, sir.
Q. You've testified previously, and I just want to confirm that nothing has changed, that EPA has not required Monsanto to conduct a long-term feeding study using a formulated product?
A. That's correct.
Q. And since your last depositions, you would agree that there are -- strike that.

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You agree that there are now many registrants of glyphosate-based products besides Monsanto; correct?
A. Yes.
Q. And agree that as of today EPA has never required any registrant of a glyphosate-based project to conduct a long-term feeding study using a formulated product?
A. That is correct.
Q. Are you aware -- strike that.
Are you aware of anyone that has conducted a long-term cancer feeding study with a glyphosate-based herbicide?
A. Yes.
Q. Who is that?
A. A team led by Seralini in France.
Q. Just like to turn your attention to page 6 of your report. Actually, it starts on page 5. And it's paragraph 7(b).
A. 7(b)?
Q. Yes.
Okay. You state, "Despite knowledge of the differences in toxicity and risks arising from exposures to formulated Roundup in contrast to pure glyphosate, Monsanto has not carried out critical long-term cancer feeding studies with Roundup. Nor has anyone else."

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Do you see that?
A. Yes.
Q. Are you testifying today that that statement is inaccurate?
A. This is in the context of EPA-required chronic feeding studies. This passage, if you read the whole thing -- the whole passage, and it's really talking about the data generated by -- by registrants. And it -- so that's what this statement refers to.
I was aware of the Seralini study. I've had extensive discussions in past depositions about the Seralini study. It -- I think it is clear from my past testimony I'm aware that it exists. I just mentioned it to you, but I do not -- I did not include it in this statement because it wasn't a study done in response to a data requirement following the GLP requirements and protocols in Part 158.
Q. You're aware, of course, that EFSA has found the Seralini study to be unreliable; correct?
A. I'm aware of much of the international reaction to the Seralini study, the efforts of Monsanto to undermine -- undermine it. I know EFSA has questions about it. I know that EPA has had questions about it. So -- and so I guess the answer to your question is yes.
Q. Are you aware of any pesticides -- sitting here

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today, are you aware of any pesticide manufacturer that has conducted a long-term feeding study on a formulated product?
A. No.
Q. Would you agree then that it's not industry standard to conduct a long-term feeding study on a formulated product?
MR. KRISTAL: Object.
A. Oh, most -- most surely. It's not industry standard.
Q. Going back to paragraph 87, which is the one I read previously.
A. It's going to be about page 25 or something?
Q. 26, yeah.
A. 26. I'm there, sir.
Q. So I had read the preceding sentence, that you state in your opinion Monsanto should have carried out a long-term feeding study; correct?
A. On a formulated --
Q. On a formulated product.
A. Major formulated product, correct.
Q. You then say, "It also does not relieve Monsanto of its obligation, as the dominant manufacturer of glyphosate-based herbicides, to carry out such a study in the interest of assuring its formulated

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products are as safe as the company had been claiming since the late 1970s."
Did I read that correctly?
A. Yes.
Q. What is the source of Monsanto's obligation to carry out this study?
A. Their obligation under FIFRA to assure that the pesticide products that it obtains, labels through the EPA process, and sells to users do not pose, in general, a risk of unreasonable adverse effects, of which certainly non-Hodgkin's lymphoma would classify as an adverse effect in humans.
It is -- it is the responsibility of registrants under the statute to assure that their products do not pose excessive risk, i.e., an unreasonable adverse effect on man.
And when a company has in its possession information that suggests that such risks may actually be occurring, and especially when a registrant has acknowledged that there are valid reasons to expect that their formulated products are more toxic than their pure technical active ingredient, that combination of facts is what leads me to my opinion that Monsanto had an obligation to conduct long-term chronic feeding studies on formulated product, given that it was manufacturing

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and selling the most heavily applied pesticide in the history of the world.
This was not just an average pesticide. This is the most heavily used pesticide in history. There are more people exposed to it at a higher level than probably any pesticide ever. Monsanto was fully aware of those facts. And given that, given their professed statement and commitment to product stewardship and the safety of its users, and given the enormous amount of money that they were making off the product, they surely could have justified doing a chronic mouse and a chronic rat study on one of their major formulations.
And had they done that, and if the studies had been clean, then we would not be sitting here. However, if they did the studies and the results were substantially different than the 14 animal bioassays conducted with technical glyphosate, the regulatory -- as I said in one place in the report, the regulatory history of Roundup would have been changed. It's impossible to predict exactly how, but it would have been changed.
Q. We've discussed that there are other manufacturers of glyphosate-based herbicides; correct?
A. Now there are.
Q. Now there are. And you state in your report

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that Monsanto, as the dominant manufacturer of glyphosate-based herbicides, had an obligation to conduct this study; correct?
A. Right. Correct.
Q. Is it your position that other manufacturers of glyphosate-based herbicides don't have an obligation to conduct such a study?
A. Certainly not until Monsanto has done it. Monsanto still is the dominant single company in the world. It's true that there's -- roughly half of the global supply of glyphosate is manufactured in China, but it's many companies that do it.
So in terms of the economic importance of glyphosate-based herbicides to a company, there is no question but that Monsanto is the major global player.
Q. So the obligation you're referring to turns in part on a company's market share; is that a fair characterization?
A. Absolutely.
And in all pesticide regulation, the company that typically first registers a pesticide active ingredient, a company that has a proprietary position in it, a company that has the most extensive set of labels, it is looked to by the rest of the industry as bearing the principal responsibility for assuring that the

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database is complete and that any questions that regulators have, any questions that the medical community might have, are being dealt with.

Q. You've never designed a long-term cancer study; correct?

A. Oh, my gosh. Are we back to that?

Q. We're back to that.

MR. KRISTAL: Yeah. Don't answer that.

THE WITNESS: Yes.

MR. ESFANDIARY: You've asked it four, five times now.

MR. FAYNE: I'm just setting up the next line of questioning.

MR. KRISTAL: It doesn't matter what you're setting up.

Q. (BY MR. FAYNE:) Okay. As someone that's never designed a long-term cancer study, how can you -- strike that.

As someone who has never designed a long-term cancer study, do you know whether it's feasible to conduct such a study on a formulated product?

A. Absolutely it's feasible and it should have been done.

Q. What is your -- what are you relying upon to assert that it's absolutely feasible?

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A. There's no -- no scientific, chemical, biological, physiological reason why a group of mice or rats could not be treated with or exposed to the formulated product as opposed to the technical active ingredient. There's absolutely no reason why a study couldn't be conducted in exactly the same way.

Q. It's possible that administering the surfactants in formulated products could make the mice ill before you'd be able to obtain any meaningful results on cancer; isn't that correct?

MR. KRISTAL: You're asking if something is possible? Is that the question?

MR. FAYNE: Yes.

THE WITNESS: That's a -- it's really an irrelevant question.

In the design of a cancer study, EPA guidelines call for, first, a range-finding study. And in that range-finding study, groups of -- we'll use mice as the example -- are fed progressively higher doses to determine a maximum tolerated dose.

It is -- it is virtually certain that the maximum tolerated dose in a Roundup study, including the standard POEA surfactant, would have been substantially lower than the maximum tolerated dose in the current animal feeding studies using technical glyphosate.

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Everybody knows that that would be the case. But that -- there's no reason why those range-finding studies couldn't be done and then the registrant would pick typically two intervening dose levels between zero, or the control group, and the maximum tolerated dose of animals fed the formulated product.

Q. (BY MR. FAYNE:) I'd like to turn now to your discussion of ghost-writing, which starts on page 111.

In paragraph 499 of your report -- let me know once you're there.

A. I'm there.

Q. You provide a definition of "ghost-authorship" or "ghost-writing"; correct?

A. Yes.

Q. And you state that, "Ghost-writing refers" -- "refers to three types of contributions to a written document by a person not listed as the author or among the co-authors of a document"; correct?

A. Yes.

Q. "Those three types of contributions include producing the first and original draft of a document or sections of a document"; correct?

A. Correct.

Q. The second is "revising a document or its sections in a way that adds to or alters the substantive

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content of the document"; correct?

A. Yes.

Q. And the third is "providing information and text, either as original writing or text derived from the existing document, that is used by a listed author or co-author or document editor to alter the content of a document and/or respond to comments made during peer review"; correct?

A. These are the circumstances in which ghost-writing could occur in the standard process of publishing a scientific study in a peer-reviewed journal.

Q. How did you come up with this definition of ghost-writing?

A. This is a generally known, generally accepted understanding of what ghost-writing is.

Q. Are you relying on any particular source to come up with the definition?

A. I don't -- I don't -- I can't think of any specific source. I don't think there's any ambiguity or disagreement. This is the way Monsanto uses the term "ghost-writing."

It's very clear from the many e-mails where Monsanto discusses its use of the technique of ghost-writing. So, I mean, I don't think

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there's -- that there's any real disagreement that these are examples of ghost-writing.

Q. You derived your definition of ghost-writing in part on the way Monsanto described ghost-writing in internal e-mails. Is that accurate?

A. No. No. No.

I mean, I -- before I became involved in this case, I knew what ghost-writing was. Anybody that publishes in scientific journals understands the importance of accurate authorship.

The COPE guidelines, which is one of the standard set of professional guidelines for scientists, discuss appropriate attribution of authorship. They describe accurate declarations of conflicts of interest. They describe when and how funding should be disclosed.

And, you know, I don't think there's really any serious disagreement or ambiguity about each of these three examples of ghost-writing that I've noted in my report.

MR. FAYNE: I'm marking as Exhibit 19 an article from COPE, which you just referred to in your testimony, about authorship disputes.

(Exhibit 19 marked for identification.)

Q. (BY MR. FAYNE:) Have you seen this document before?

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A. Yes.

Q. If you go to the third paragraph, it states that, "Listing the authors tells readers who did the work and to ensure that the right people get the credit and take responsibility for the research. Although journal editors do not always agree among themselves on what constitutes authorship, many of them subscribe to the guidance from the International Committee of Medical Journal Editors (ICMJE), also known as the Vancouver group."

Did I read that correctly?

A. Yes, you did.

Q. Are you familiar with the International Committee of Medical Journal Editors?

A. I am.

Q. Would you agree that ICMJE is an authoritative source on ethical guidelines for publishing in peer-reviewed journals?

A. It's certainly one of the most widely accepted and aspired to.

Q. Agree that many journal editors rely on it, as described in this COPE article?

A. Yes.

Q. Did you review the ICMJE guidelines in reaching your opinions in this case on ghost-writing?

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A. Actually, I've had to review them for -- because of my co-authorship of multiple papers over the last four, five years. Most of the nutrition papers that I've written, the journals rely on the ICMJE guidelines.

Q. So if you look at the paragraph after the one we just read, it restates the ICMJE guidelines as they existed in 2001; correct?

A. Yes.

Q. And they state that, "Authorship credit should be based only on: (1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content; and (3) final approval of the version to be published."

Did I read that correctly?

A. Yes.

Q. And the next sentence states, "Conditions (1), (2) and (3) must all be met"; correct?

A. Yes.

Q. So under these guidelines, in order to be listed as an author someone must meet all three criteria; correct?

A. Yes.

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Q. Would you agree that these three criteria are different than the ones that you set forth in paragraph 499 of your report?

A. Modestly.

Q. Modestly?

A. Yeah.

Q. In your report, you state that, "Providing information and text that is used by a listed author or co-author without being listed as an author constitutes ghost-writing"; correct?

A. Let's -- let's review the material under -- on the right-hand side column, "How to reduce the incidence of authorship problems."

"People generally lie about authorship in two ways: By putting" -- First, "by putting down names of people who took little or no part in the research (gift authorship, see below)."

Second bullet, "By leaving out names of people who did take part (ghost-authorship, see below)."

It's my articulation and explanation of what I mean by "ghost-writing" or "ghost-authorship" is fully consistent with these guidelines.

MR. FAYNE: I'm going to move to strike that answer as non-responsive.

MR. KRISTAL: I think it's completely

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responsive, but we don't have to decide that right now. Nor do we have the authority to decide it.

MR. FAYNE: Sure.

I'll repeat the question and we can all decide whether that answer was responsive.

MR. KRISTAL: Sure.

Q. (BY MR. FAYNE:) The question was, you state in your report that providing information and text that is used by a listed author or a co-author without being listed as an author constitutes ghost-writing; correct?

A. Correct.

Q. Somebody could provide information or text that's used in a study or report without having final approval of the study; correct?

A. Presumably, yes.

Q. Somebody could produce the first draft of a document without having final approval of the document; correct?

A. Yes.

Q. Someone could revise a document without having final approval of the document; correct?

A. Yes. What's your point?

MR. KRISTAL: You don't have to ask -- your job is not to ask, just to answer.

THE WITNESS: Jerry, you're being very nice,

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but I'm getting to the end of my rope on some of this.

MR. KRISTAL: No, I understand. Be patient. We are now -- we've got less than an hour left of his Monsanto questions.

Q. (BY MR. FAYNE:) In your view, if somebody provides edits to a document and isn't listed as an author, is that ghost-writing?

A. Depends whether the edits change the substance of the paper or whether they're done by an editor or someone that is proofreading or really not -- not tasked or capable of changing the substantive content of the document.

It's very common. For example, a lot of scientists don't have English as a first language. They -- they write some English, and then one -- somebody, sometimes even a person that's not listed as a co-author, will clean up the English so that proper tensive verbs are used, et cetera.

Q. Apart from language translation issues, editing a document for clarity, would that be something that would require somebody to be listed as an author?

A. Probably not, if it's truly just for clarity and it doesn't change the substantive content. But the decision on how substantial the contributions of an editor are in terms of clarifying the content of a

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paper, you know, it has to be left up to the team.

I can -- I can imagine that there are circumstances where, you know, substantial editing and refinement of the clarity of passages, some -- some teams may say, Let's add so-and-so as a co-author. There's no harm in doing that. There's no -- no reason preventing that from being done.

Q. Understood, but my question is more aimed at when is it required in order to comply with ethical guidelines, not can you do it.

A. Okay. All right. Fair enough.

Q. So my question is, at what point is it required --

A. I already answered that.

Q. I under --

A. When the editing changes the substantive content of the document.

Q. By "substantive content," do you mean the conclusions of the document, of the study authors?

A. No, I mean the substantive content of it, as opposed to the words that are chosen to express a given sentence.

Do we really need to argue about what substantive content is?

Q. You tell me.

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MR. ESFANDIARY: Well, Bill Heydens thought he could ghost-write things. I mean --

MR. FAYNE: Can we not have people who aren't even defending the deposition testifying?

Q. (BY MR. FAYNE:) In your report you focus primarily on four studies that you contend were ghost-written by Monsanto; is that fair?

A. There's more than four.

Q. But the four that you have independent sections for; correct?

A. Yes. There's -- I -- I don't remember exactly how many there are independent sections on, but in the "Critical Reviews of Toxicology" special issue, there's five papers.

Q. Okay. So let me walk through the section. So there's the Gary Williams, et al., 2000 paper; correct?

A. Correct.

Q. And that was published in the Journal of Regulatory Toxicology and Pharmacology?

A. Correct.

Q. There's the Williams, et al., 2012 paper that was published in the Journal of Toxicology and Environmental Health; correct?

A. Yes.

Q. There's the Kier and Kirkland 2013 paper

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published in the journal Critical Review in Toxicology; correct?
A. Correct.
Q. And then there's the Critical Reviews in Toxicology special issue on glyphosate risks; correct?
A. Correct.
Q. So I'm going to focus on those four, if that's okay with you.
A. Sure.
MR. KRISTAL: Would you do it if it wasn't okay with him?
MR. FAYNE: Yes.
Q. (BY MR. FAYNE:) You're aware, I imagine, that each of these journals have authorship guidelines; correct?
A. Yes.
Q. Did you review the authorship guidelines in forming your opinions in this case?
A. I don't remember which ones I did and didn't. I had reviewed the Critical Review of Toxicology because I -- I had thought about submitting a paper to it myself.
I don't remember which ones I specifically reviewed, but, you know, I'm fairly certain there's not a lot of difference across them, but they are generally

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consistent with the COPE and the International Committee on -- of Medical Journal Editors' guidelines.
Q. Each of these four publications that I just listed -- one of which I understand is a series of articles; correct?
A. Correct.
Q. Each of those publications were reviews of studies in the existing published literature; correct?
A. Yes.
Q. They were not primary studies?
A. Correct.
Q. So I take it you're not contending that Monsanto manipulated the underlying data, scientific data, in any way; correct?
A. I'm not speaking to that. I'm not saying they did; I'm not saying they didn't.
Q. Do you have any reason to believe that the authors listed in these studies did not agree with the analyses or conclusions set forth in the studies?
A. No.
Q. Any reason to believe that Monsanto or its employees caused the authors to change their conclusions?
A. Yes.
Q. For which study?

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A. Well, several of them. There was multiple back-and-forths between Heydens and authors of the Critical Review of Toxicology special issue. You know, and as I said, there's extensive records that I've reviewed where Heydens was the Monsanto official who was most frequently involved in inserting his personal and presumably Monsanto corporate views in these journal articles as they were in the various stages of preparation.
Q. Is it your testimony that the authors of any of these articles believed that the science showed glyphosate to be carcinogenic?
A. I've never put that question to any of them directly so I have no idea whether they hold that view. The papers in which their names appear does not state that view.
Q. And you're not testifying that they initially stated that view and then Monsanto somehow convinced them to reverse course and say that glyphosate was not carcinogenic; correct?
A. I'm not aware of that occurring.
Q. A little earlier you testified that, I believe, that it was well known by Monsanto that its formulated product was more toxic than glyphosate alone; correct?
A. Correct.

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Q. You would agree with me that toxic does not necessarily equal carcinogenic; correct?
A. Surely. There is multiple forms of toxicity that fall short of inducing cancer.
Q. Toxic and carcinogenicity are two different concepts; correct?
A. Well, carcinogenicity would -- is a toxic effect, but there are many other toxic effects.
Q. And many substances can be toxic at certain doses; correct?
A. To certain organisms, of course.
Q. So even water at a high enough dose could be toxic; correct?
A. Well, I don't know if it would be exactly -- it floods the lungs and keeps air from getting in and you die, so it's not -- it's -- that is not a toxic mode of action in inducing death.
Q. So --
A. Nor is getting crushed by an 18-wheeler.
Q. Understood.
A. Okay.
Q. So for the members of the jury, just to be clear, when you say "toxic," you don't mean carcinogenic; correct?
A. A pesticide that is toxic could also be a

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pesticide that is carcinogenic. A pesticide that is carcinogenic is by definition toxic because carcinogenicity is a component of or falls within the realm of toxic responses.
Q. But a pesticide that is toxic is not necessarily carcinogenic?
A. Correct.
Q. So the fact that something is toxic does not mean that it's carcinogenic; correct?
A. Not necessarily.
Q. In your May deposition you were asked about a number of foreign regulatory determinations; do you recall that?
A. EFSA, Canada, yes, I do remember that.
Q. So you acknowledge that a number of foreign regulators, including Canada, EFSA, New Zealand, Australia, that they've classified glyphosate as non-carcinogenic; correct?
A. We've discussed that, yes.
Q. And that's all of those since the IARC determination in 2015; correct?
A. Yes. Some of them were before, some of them after, and I don't believe any of them have changed.
Q. Are you aware of any foreign regulatory body that has conducted a risk assessment of glyphosate since

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the IARC classification and concluded that glyphosate is carcinogenic?
A. Not that -- not a reassessment that's resulted in a final conclusion, no.
Q. So you would agree that as of today IARC is the only scientific or regulatory entity in the world that has reviewed the full evidence on glyphosate and concluded that glyphosate is a probable carcinogen; correct?
A. Well, I think the Office of Environmental Health's assessment in the state of California has reached that conclusion.
Q. And you're -- it's your understanding that -- I believe you're referring to OEHHA in California?
A. Yeah, OEHHA.
Q. That they conducted a risk assessment and reached that conclusion?
A. Yes.
Q. And they reviewed studies and data in reaching that conclusion?
A. Yes. And, as you know, their regulations also require them to follow IARC determinations.
Q. Right. So OEHHA was required by statute to classify glyphosate as a probable carcinogen based on the IARC determination; correct?

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A. Correct. But then they also did their own assessment of the science in an effort to fully implement the requirements of Proposition 65.
Q. What assessment was that? Is there -- is there a name for it? I'm not sure what you're referring to, so I'm...
A. Under Proposition 65, the OEHHA is responsible for coming up with a NSRL. I can't remember exactly what the acronym refers to, but it's a level of exposure below which there would not be a requirement for listing. So they set a benchmark for exposure.
Q. That's a level of exposure below which the state agency does not believe there's any risk of cancer; correct?
A. And any need to so label under Prop 65.
Q. Right. So no need to label, and that's the level at which the agency believes there's no risk of cancer; correct?
A. I don't think it would be accurate to say "no risk of cancer," but it is accurate to say it's a threshold below which the -- the agency would not require the listing of chemicals under Proposition 65.
Q. Other than OEHHA in California, would you agree that as of today IARC is the only scientific or regulatory entity in the world that has reviewed the

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evidence and concluded that glyphosate is a probable carcinogen?
A. Certainly there's no other one that's done an extensive and independent review as IARC has, no.
Q. You state in paragraph 13 of your report that, "Monsanto has failed to meet its obligation by failing to warn about the risks of oncogenicity, genotoxicity, and, most recently, carcinogenicity."
A. Correct.
Q. Are you aware of any pesticide manufacturer that has placed a warning on its label for oncogenicity?
A. Yes.
Q. You've seen pesticide labels that include a warning for oncogenicity?
A. Yes.
Q. Which labels are those?
A. Some of the 2,4-D labels have a warning. The -- I think Monsanto put a warning on Alachlor labels at the -- at one point in the history of Alachlor.
I think there probably was a warning on the EDB labels, ethylene dibromide, and, you know, I'd have to go through the list of oncogenic active ingredients and look at -- look at the various labels, but I have not done that analysis in preparation for this case.
Q. What about genotoxicity? Have you ever seen a

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pesticide label that includes a warning for genotoxicity?
A. Let's see. I'd have to -- I'd have to do an assessment of different -- different active ingredients to answer that. I didn't -- I didn't make an effort to do that in preparation for this.
Q. So sitting here today, you're not aware of any pesticide manufacturer that has added a genotoxicity warning on its pesticide product label; correct?
A. Correct.
Q. If you go to paragraph 20 of your report.
A. Page 13?
Q. Sounds right.
A. I'm there.
Q. Have you ever seen -- sorry, before we get to paragraph 20, have you ever seen a pesticide label that includes a warning based on an association found in epidemiological study, an association between the product or its ingredients and cancer?
A. I think -- I certainly know that there's some chemical safety data sheets that do that, and there's some of the OSHA sheets that do that, but on a -- on an end-use product label, I'd have to, again, do an assessment.
Q. So sitting here today, you're not aware of any

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pesticide product label that includes a warning that's based on an association found in an epidemiological study; correct?
A. Solely on that, no.
Q. So now turning to paragraph 20. You state that, "Two common assertions" -- sorry, I'm skipping to the second sentence of that paragraph.
A. By all means, go for it.
Q. "Two common assertions that have perpetuated a lack of care by some people applying Roundup herbicide are that Roundup is non-toxic and safe enough to drink."
Do you see that?
A. Yes.
Q. What are you relying on for your statement that Monsanto has asserted that Roundup is safe enough to drink?
A. I didn't say that Monsanto has asserted that. Many other people have.
And what I say in this paragraph is that Monsanto has not done as much as it should have to discourage overstatements of the safety of glyphosate-based herbicides. And as I -- as I note in paragraph 20, the two most common simple statements are "It's safe enough to drink" and "It's non-toxic." Those two statements arise fairly regularly in public

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discussions, media discussions, advertising material, promotional meetings.
It -- sometimes actual employees of Monsanto make those statements. Certainly William Heydens has made the statement multiple times. And I believe that it was part of Monsanto's effort to protect the freedom to operate for glyphosate-based herbicides that they wanted people to believe that glyphosate-based herbicides are non-toxic and they did very little to discourage people who were saying that it was also safe enough to drink.
Q. Your testimony is that Monsanto employees and Dr. Heydens made the statement that Roundup is safe enough to drink. Did I understand you correctly?
A. No. I said "non-toxic."
Q. And I'm asking -- I apologize. I might have misunderstood that. I'm referring to the statement that it's safe enough to drink.
Are you aware of any Monsanto employee or any agent of Monsanto that's made that statement?
A. In the record in writing, I'd have to think about that.
Q. So sitting here today, you're not aware of anything in writing in the record in the Roundup litigation that makes that statement; correct?

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A. From a Monsanto employee.
Q. Are you aware of it being said by someone other than a Monsanto employee in the discovery record in this case?
A. Yes.
Q. Who's that?
A. I'll have to -- I'll have to search it out. There's multiple instances of that.
Q. So sitting here today, you can't identify for me a document where somebody either at Monsanto or outside of Monsanto made that statement in writing; correct?
A. I'd have to -- I'd have to go back and find it. You know, I can guarantee you that that statement is in the record.
MR. FAYNE: I'll pass the witness for now.
THE WITNESS: Are you done?
MR. FAYNE: I might have more questions for you after --
THE WITNESS: Okay.
MR. FAYNE: -- your counsel has a chance to go, but I'm going to pass him over to you.
MR. KRISTAL: Why don't we take a five-minute break so we can get organized and move forward.
THE WITNESS: And I want to use the boys' room.

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VIDEOGRAPHER: Off the record at 4:30.
(A brief recess was had.)
VIDEOGRAPHER: Back on the record at 4:39 p.m.
EXAMINATION
BY MR. KRISTAL:
Q. Good afternoon, Dr. Benbrook. It's Jerry Kristal on behalf of the plaintiffs. I've got a couple of questions, if that's okay?
A. Yes, sir.
Q. First of all, just housekeeping. I'll mark as Exhibit 20 the December 26, 2018, errata sheet that we had handed to counsel for Monsanto towards the beginning of the deposition.
(Exhibit 20 marked for identification.)
Q. I'm not going to ask you questions about it, but I wanted it to be marked for purposes of the deposition, and it hadn't yet been marked.
You were asked by Monsanto counsel about both corporate ethics and sources of Monsanto's obligations to do certain things.
Do you generally remember that line of questioning?
A. Yes.
Q. Are you familiar with various international codes of conduct on pesticide management?

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A. Yes.
MR. KRISTAL: I'm going to mark as Exhibit 21 and Exhibit 22 two documents.
(Exhibit 21 marked for identification.)
(Exhibit 22 marked for identification.)
Q. (BY MR. KRISTAL:) I'm going to hand them both to you, and I'll give a copy to counsel.
Exhibit 21 is the International Code of Conduct on Pesticide Management. It has a date on the third page inside of 2014, and this is put out by the Food and Agricultural Organization of the United Nations World Health Organization.
Are you familiar with this document?
A. Yes, I am.
Q. Okay. And are you familiar with this document as part of your 30-plus years of experience and knowledge base vis-à-vis corporate stewardship for the pesticide industry?
A. Yes. I believe this document goes back to the mid '80s.
Q. If you look at Exhibit 22, and if you -- about three-quarters of the way down, it says, "Resolution 10/85," and then it has, on the --
A. Oh, okay.
Q. -- second page, "adopted November 28th, 1985."

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Is this the International Code of Conduct on the distribution and use of pesticides that you just referred to as the earlier version of this?
A. Correct.
Q. And through the years, from 1985 through 2014, has this been periodically revised?
A. If my memory serves me correctly, I believe about four times, maybe five.
Q. And do these documents establish stewardship industry standards of care for the pesticide industry?
A. Yes, they do.
Q. Now I'm going to show you -- I apologize to counsel, but I couldn't print this out.
So let me first hand my laptop to counsel to take a look. It's a page from the monsanto.com website entitled "Product Stewardship and the Pledge."
And if you want to scroll down, I'm going to ask questions about where Monsanto says it has adopted these international codes of conduct on pesticide management. And we can print that out at some point and make it a part of the record.
So for purposes of recordkeeping, that portion of the monsanto.com website we'll mark as 23.
MR. FAYNE: Counsel, are you representing that -- in this website there are links to two

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documents. Are you representing that these documents are the linked documents on the website?
MR. KRISTAL: Well, if you scroll down, there's a link to the current version of the International Code of Conduct on Pesticide Management that Monsanto says it adopts.
MR. FAYNE: Right. I see that link. I'm happy to click on it, but are you representing that this is that link?
MR. KRISTAL: It's probably the more recent version of that, but we'll -- I'll click on it and hand it back to you after I ask some questions.
Is that all right?
MR. FAYNE: Sure.
Q. (BY MR. KRISTAL:) So let me hand you or at least sit next to you.
A. I know this.
Q. You're familiar with this?
A. I have this printed out in my files.
Q. All right. On the Monsanto website under the Product Stewardship and the Pledge section, Monsanto writes, "We subscribe to international stewardship standards, including the International Code of Conduct on Pesticide Management issued by the United Nations Food and Agricultural Organization and fully supported

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by Responsible Care Global Charter."
So I'm going to click on the link that Monsanto provides, but let me show it to you. Do they have a number of versions of the international code in different languages?
A. Yes, they do.
Q. All right. And have you gone through this exercise of actually opening this on the Monsanto website?
A. But only the English version.
Q. Right. Right.
A. And you're going to get this document. This is -- I'm almost sure this is the most recent one, 2014.
Q. That's a 2014, is it?
A. Yeah.
MR. FAYNE: Can I see the document?
MR. KRISTAL: It's hopefully opening. Tell you what, why don't we go off the video record. When it completely opens, I'll show it to you, then we'll go back on the video record. Is that all right?
VIDEOGRAPHER: Off the record at 4:46 p.m.
(A brief recess was had.)
VIDEOGRAPHER: Back on the record at 4:48 p.m.
Q. (BY MR. KRISTAL:) We are going to mark, after we print out the linked International Code of Conduct

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that the Monsanto website takes it to, and what version is that?
MR. FAYNE: Object.
Q. What year?
A. 2014.
MR. FAYNE: I'm going to object to the characterization of that as the linked international code of conduct document.
MR. KRISTAL: Why is that?
MR. FAYNE: I see it's on the screen, but I don't know that that's where it's linked.
MR. KRISTAL: Okay. Why don't you go back. We'll go off the record.
VIDEOGRAPHER: Off the record at 4:48 p.m.
(A brief recess was had.)
VIDEOGRAPHER: Back on the record at 4:52 p.m.
Q. (BY MR. KRISTAL:) All right. While we were off the record, we opened up the link on the Monsanto website in the Product Stewardship Pledge section entitled "International Code of Pesticide Management."
And do you have that --
A. I do.
Q. -- open in front of you?
And what is the date on the linked international code that's on the Monsanto website?

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A. 2014.
Q. Okay. So we will print and mark as Exhibit 24 the opened linked version.
And if you would look at Exhibit 21.
A. 21.
Q. Thank you. And I'll have a couple of questions about this.
Does this document establish pesticide industry what are called stewardship standards?
A. Yes.
Q. And if you would turn to page 8.
A. The Article 3, Pesticide Management?
Q. Yes.
Does this document, in terms of its general format, lay out both government responsibilities for pesticide management and pesticide industry responsibilities?
MR. FAYNE: Object to form.
A. Yes.
Q. Okay. And on page 8, Section 3.2, under "Pesticide management," reads, "Pesticide industries should adhere to the provisions of this code as a standard for the manufacture, distribution, sale and advertising of pesticides."
Do you see that?

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A. Yes.
Q. And that is a part of this stewardship for the pesticide industry?
A. Code of conduct, stewardship, yes.
Q. And in the lower right-hand corner -- I'm sorry. Under 3.5, "Pesticide industry and traders should observe the following practices in pesticide management."
Correct? That's what it says?
A. Yes.
Q. And then under that, 3.5.3, "Pay special attention to the choice of pesticide formulations and to presentation, packaging and labeling in order to minimize risks to users, the public and the environment."
Is that part of the stewardship pesticide industry standard adopted by Monsanto?
A. Yes, it is.
MR. FAYNE: Objection to the characterization that it was adopted by Monsanto.
MR. ESFANDIARY: It's on the website.
MR. KRISTAL: It's on their website with a link to it. Other than that --
THE WITNESS: But the --
MR. KRISTAL: And they said they're adopted.

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Q. (BY MR. KRISTAL:) Okay. The next page, 3.5.6 under "Pesticide industry responsibilities," "Retain an active interest in following their products through their entire lifecycle, keeping track of major uses and the occurrence of any problems arising from the use of their products as a basis for determining the need for changes in labeling, directions for use, packaging, formulation, or product availability."

Is that also part of this industry standard adopted by Monsanto?

A. Yes, it is.

MR. FAYNE: Objection. Same objection.

Q. Under Section 3.11 of the pesticide management standard, "Governments, pesticide industry and the application equipment industry should develop and promote the use of pesticide application methods and equipment that minimize the risk from pesticides to human and animal health and/or the environment and that optimize efficiency and cost effectiveness, and should conduct periodic practical training in such activities."

Is that another part of this standard that is linked to the Monsanto website?

MR. FAYNE: Same objection.

A. Yes, it is.

Q. All right. And if you turn to page -- I'm

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sorry, to Exhibit 22 now, the 1985 standard, does this also set out -- if you'd look, for example, at Section 3.3 -- government standards that should be --

A. What page are we on?

Q. It's Section 3.3.

A. Okay. Get the -- okay. I'm there.

Q. Sets out government standards --

A. Yeah, 3.3.

Q. -- as well as pesticide manufacturing standards?

A. Correct.

Q. All right. 3.4 of the 1985 International Code of Conduct on the Distribution and Use of Pesticides reads, "Manufacturers and traders should observe the following practices in pesticide management, especially in countries without legislation and the means of implementing regulations."

3.4.2, "Pay special attention to formulations, presentation, packaging and labeling in order to reduce hazards to users to the maximum extent possible, consistent with the effective functioning of the pesticide in the particular circumstances in which it is used."

Is that part of this 1985 code of conduct?

A. Yes, it is.

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Q. And is this part of the reason that -- part of the basis for your opinion that Monsanto should have included an oncogenicity warning on its label as of the time of the 1983 mouse study?

MR. FAYNE: Object to form.

A. As of the time of the CARC review in 1985, correct.

Q. And is it also part of the basis of your opinion in terms of Monsanto's obligation to conduct the chronic feeding study with glyphosate-based herbicides?

MR. FAYNE: Object to form.

A. Yes.

Q. And if you look at Section 3.4.4, "Retain an active interest in following their products to the ultimate consumer, keeping track of major uses and the occurrence of any problems arising in the actual use of their products as a basis for determining the need for changes in labeling, use directions, packaging, formulation, or product availability."

Is that part of this standard and part of the basis of your opinion in terms of Monsanto's obligations?

MR. FAYNE: Object to form.

A. Yes, it is.

Q. And under 3.4.3, "A manufacturer should

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provide, with each package of pesticide, information and instructions in a form and language adequate to ensure safe and effective use."

Is that also part of the basis of your opinion for Monsanto's obligations?

MR. FAYNE: Object to form.

A. Yes, it is.

Q. You were asked if there was any company that ever put an oncogenicity warning on a product, and you mentioned Alachlor. First of all, what is Alachlor?

A. It's a grass herbicide at the time manufactured by Monsanto.

MR. KRISTAL: And it's A-L-A-C-H-L-O-R, capital A.

(Exhibit 25 was marked for identification.)

Q. (BY MR. KRISTAL:) I'm marking as Exhibit 25 two pages from the 1985 Monsanto Crop Chemicals Sample Label Guide, and on the second page of the document, up top, it reads, "Important 1985 label changes?"

Do you see that?

A. Yes.

Q. And is this the basis in terms of your understanding that Monsanto itself had put an oncogenicity warning on its Alachlor?

A. Yes.

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MR. FAYNE: Object to form.
Q. In the -- under the section "Important 1985 label changes," the first bullet point in the left-hand column, "As mentioned earlier, the results of tests in which laboratory animals were fed Alachlor daily throughout most of their lifetimes led to the additions of a warning statement on the label, 'The use of this product may be hazardous to your health. This product contains Alachlor, which has been determined to cause tumors in laboratory animals.'"
Is that an oncogenicity warning?
A. Yes.
Q. In this label change announcement from 1985, is there also another change that's being announced for the products that are listed here to "Wear goggles or face shield, rubber gloves, long trousers, long sleeve shirt or jacket of tightly woven material, along with boots high enough to cover ankles when transferring and mixing and when adjusting, repairing or cleaning equipment. Wear rubber boots when pouring from open containers or when re-entry is made into fields where the product has been applied through center pivot irrigation system and the field is still wet."
MR. FAYNE: Object to form.
Q. Is that something Monsanto was putting on the

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label for the products listed on the second page of this, similar to what EPA wanted Monsanto to put on the Roundup label in terms of the worker protection provisions?
MR. FAYNE: Object to form.
A. Yes, very -- very similar and essentially -- essentially the same time. This is 1985, and the glyphosate registration document was 1986.
Q. And the new label specifies, in addition to what I just read, "Clothing which comes in contact with Lasso must be washed before reuse. Clothing or other materials which has become drenched with the concentrated pesticide must be disposed of in a sanitary landfill by incineration or, if allowed by state and local authorities, by burning. If burned, stay out of smoke."
And is that similar to one of the worker protection provisions EPA had requested Monsanto put on the Roundup label regarding clothing which comes in contact and is drenched by Roundup?
MR. FAYNE: Object to form.
A. Its -- it's very similar, yes.
Q. Over lunch we had referred to a homework assignment where you were going to be looking at the Dr. Parry-submitted reports to Monsanto to identify the

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11 recommended studies he was proposing.
Do you recall that line of questioning?
A. Yes.
Q. And did you go through that exercise over lunch?
A. Yes.
Q. Did Monsanto counsel then not ask you about that?
A. Correct.
Q. Okay. And were you also asked to look up two of the studies that had been referenced in your report regarding genotoxicity and in vivo chromosomal damages?
A. Correct.
Q. And did you do that?
A. Yes, I did.
Q. Over the lunch break?
A. Yeah. Yes.
Q. And were you asked about that by Monsanto counsel?
A. No.
Q. I'd like you to try to find Exhibit 11 that was given to you earlier today by Monsanto counsel.
MR. FAYNE: Which exhibit is that?
MR. KRISTAL: It's the electronic code of federal regulations regarding recording requirements.

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THE WITNESS: Got it.
MR. FAYNE: Could you give me one second?
MR. KRISTAL: Sure. Take your time.
MR. ESFANDIARY: You got it?
MR. FAYNE: Yeah. Thank you.
Q. (BY MR. KRISTAL:) You were asked about certain sections by counsel for Monsanto. Let me ask you about other sections.
First of all, on the first page, Section 159.153 entitled "Definitions," do you see that?
A. I see. I do.
Q. If you would turn to the next page and look at the definition of "qualified expert."
Do you see it there up top?
A. I do.
Q. Okay. "Qualified expert means one who by virtue of his or her knowledge, skill, experience, training or education could be qualified by a court as an expert to testify on issues related to the subject matter on which he or she renders a conclusion or opinion. Under Rule 702 of the Federal Rules of Evidence, a person may be qualified as an expert on a particular matter by virtue of knowledge, skill, experience, training, or education. In general, EPA wants registrants to report information when a person

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has relevant expert credentials (e.g., a medical doctor giving a medical opinion, a plant pathologist giving an opinion on plant pathology, et cetera)."

Do you see that?

A. Yes, I do.

Q. Would Dr. Parry fall under the definition of qualified expert in the field of genotoxicity?

MR. FAYNE: Objection. Calls for a legal conclusion.

A. Yes, he certainly would.

Q. And if you turn to page 3 of 14, Section 159.158.

A. I'm there.

Q. And that section is entitled "What information must be submitted?" is it not?

A. Correct.

Q. And it reads, Section A, "General. Information which is reportable under this part must be submitted if the registrant possesses or receives the information and the information is relevant to the assessment of the risks or benefits of one or more specific pesticide registrations currently or formerly held by the registrant.

"Information relevant to the assessment of the risk or benefits also includes conclusions or opinions

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rendered by a person who meets any of the following: (1) who was employed or retained directly or indirectly by the registrant and was likely to receive such information; (2) from whom the registrant requested the opinions or conclusions in question, and, (3), who is a qualified expert in Section 159.153(b).

Do you see that?

A. Yes, I do.

Q. Okay. Would the Dr. Parry reports that were sent to Monsanto at their request on genotoxicity fall under the category 159.158, information that must be submitted to the EPA?

MR. FAYNE: Objection. Calls for a legal conclusion.

A. Yes, it would. Or yes, they would.

Q. And would this also apply to the TNO reports and preliminary reports that Monsanto received regarding the dermal absorption experiments?

MR. FAYNE: Objection. Calls for a legal conclusion. Also vague as to what "this" is.

A. Yes, it would.

Q. Okay. If you would be kind enough to go to page 157 of your report, Exhibit 3, where you discuss the FIFRA Section 6(a)(2) reporting requirements.

A. Okay.

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Q. Page 157?

A. Paragraph 157?

Q. No, page 157, paragraph 734.

A. Way in there. What did I write such a long report for? Okay. I'm there.

Q. And you have a three-paragraph section entitled "Section 6(a)(2) of FIFRA," do you not?

A. Yes, I do.

Q. On paragraph 735, you wrote the following: "The June 1986 registration standard for glyphosate contains this passage: 'Registrants,'" and you wrote at that -- you added "[at this time for glyphosate, only Monsanto] are reminded that FIFRA Section 6(a)(2) requires them to submit factual information concerning possible unreasonable adverse effects of the pesticide at any time they become aware of such information, including interim or preliminary results of studies if those results suggest a possible adverse effect on man or the environment. This requirement continues as long as your products are registered by the agency."

Did the TNO study results that were provided to Monsanto on the dermal absorption fall under that definition?

MR. FAYNE: Objection. Calls for a legal conclusion.

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A. Yes.

Q. And is that part of the reason it is your opinion that they had to have been submitted to EPA?

A. Because they contained new information that shed new light on the potential of adverse effects on human beings exposed to glyphosate-based herbicides.

(Exhibit 26 was marked for identification.)

Q. (BY MR. KRISTAL:) I'm marking as Exhibit 26 an e-mail from [redacted] M-A-R-T-E-N-S, dated April 19th, 1999. And it is to a number of people, including Larry Kier, K-I-E-R, William Heydens, H-E-D -- strike that -- H-E-Y-D-E-N-S, Donna Farmer, and others. And it's entitled "Meeting minutes 2/25."

Do you see that?

A. I do.

Q. Are you familiar with this document?

A. Yes.

Q. And is this a document that had been produced by Monsanto in this litigation?

A. Yes.

Q. And [redacted] writes, "Donna, thanks for this. It accurately reflects the situation. Please take note of the following update. I received from Professor Parry the signed secrecy agreement. As a response, I sent him a letter of authorization and all

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relevant reports and publications re mutagenicity of glyphosate, its formulations, and the surfactants for which we have mutagenicity testing data."

Do you see that?

A. I do.

Q. So when you were asked earlier whether or not Monsanto had sent Dr. Parry all of the relevant genotox literature, does this indicate that in fact they had?

MR. FAYNE: Objection.

A. Yes, it does.

Q. And on the second page of the document, under "Section 4, Global Experts."

A. I'm just looking down through --

Q. Oh, okay.

A. -- this list. On page 2?

Q. "Section 4, Global Experts."

MR. FAYNE: Counsel, did -- was this highlighting in the original document, or did you add it?

MR. ESFANDIARY: No, that's added.

MR. FAYNE: What's that?

MR. ESFANDIARY: That's added.

MR. FAYNE: That's added by you-all?

MR. ESFANDIARY: Yeah.

MR. FAYNE: Okay. Just want to make sure.

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THE WITNESS: I'm sorry, I'm missing where you are.

Q. (BY MR. KRISTAL:) Sure. Page 2, Section --

A. So we're down into the Donna Farmer?

Q. Yes.

A. All right.

Q. Let's state that. Donna Farmer had meeting minutes dated 2/25 that she had prepared April 17th, 1999, which is on the second page of this e-mail; is that correct?

A. Yes.

Q. And she writes, "Please find the meeting minutes and actions from our 2/25 meeting below."

A. Correct.

Q. Does she not?

A. Yes.

Q. And paragraph 4 of the meeting minutes is entitled "Global Experts"?

A. Yes.

Q. And it reads, "Reviewed Dr. Parry's analysis. What is our next step? Dr. Parry concluded on his evaluation of the four articles that glyphosate is capable of producing genotoxicity both in vivo and in vitro by a mechanism based upon the production of oxidative damage. The data that Dr. Parry evaluated is

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limited and is not consistent with other better conducted studies. In order to move Dr. Parry from his position, we will need to provide him with the additional information as well as asking him to critically evaluate the quality of all the data, including the open literature studies."

Is that statement, "In order to move Dr. Parry from his position," an example of Monsanto dealing with adverse information obtained by an expert?

MR. FAYNE: Objection.

A. Yes.

Q. With respect to TNO, if you'd go to the Exhibits 12 and 13. 12 is the final report. 13 is the draft TNO report.

A. 12 and 13?

Q. Yes, sir.

A. There's 12 and there's 13. Okay. I got them.

Q. First of all, did Monsanto choose TNO to conduct the study, the dermal absorption study?

A. Yes, they --

MR. FAYNE: Objection.

THE WITNESS: Yes, they did.

Q. (BY MR. KRISTAL:) And if you look on what's listed as page 8 of 41 of Exhibit 12, the final study.

A. 8 of 41?

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Q. Yes.

A. Page 8? Yes.

Q. You're aware that Dr. F. [redacted] -- B-R-O-E-C-K-A-E-R-T -- was the study monitor from Monsanto?

A. Correct.

Q. He's listed here as a study monitor?

MR. FAYNE: Objection. Lacks foundation.

A. Yes. That's [redacted]

Q. Okay. And if you look at Exhibit 13, the draft, that was faxed to whom?

A. To Dr. [redacted]

Q. Okay. The person that was listed as the study monitor?

A. Correct.

Q. And who is he employed by, according to this fax?

A. Monsanto Europe.

Q. Okay. And on the Exhibit 12, the final report, is there a Good Laboratories Practice Statement of Compliance?

A. Yes, there --

MR. FAYNE: Sorry. Which page are we on now?

MR. KRISTAL: We are on page 5 of 41 of Exhibit 12.

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THE WITNESS: Yes, there is.
Q. (BY MR. KRISTAL:) And it's entitled "Statement of GLP compliance."
"We, the undersigned, hereby declare that this report constitutes a true and complete representation of the procedures followed and of the results obtained in this study by TNO Nutrition and Food Research, and that the study was carried out under our supervision. The study was carried out in accordance with the OECD Principles of Good Laboratory Practice."
Do you see that?
A. Yes, I do.
Q. And does that same statement appear in the draft, Exhibit 13, accepted as not signed and dated?
A. No, it doesn't.
Q. If you look at page 4 of --
A. The statement appears, but it's not signed.
Q. Right. Exactly. So is that the -- in the draft, the same exact statement of Good Laboratory Practice compliance was sent among Monsanto, it just had not yet been signed and dated?
A. That is correct.
Q. All right. And if you look on page 8 of Exhibit 30 -- 13, the draft.
A. Okay, page 8. I'm there.

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Q. It's entitled "GLP Compliance Monitoring Unit Statement."
MR. FAYNE: I'm sorry. You're on Exhibit 13?
MR. KRISTAL: Yes. I'm sorry, 6. Looks like an 8.
THE WITNESS: 8.
Q. (BY MR. KRISTAL:) It does look like an 8, but it's page 6.
And it has an endorsement of compliance with good laboratory practices dated December 23rd, 1999; is that correct?
A. Yes.
Q. And if you turn to the next page, page 7 of Exhibit 13, it's entitled "Testing Facility," and it lists the name and address and phone numbers of TNO, does it not?
A. Yes.
Q. And then it reads, in the draft, "This unit is operating in full compliance with the OECD GLP principles." Do you see that?
A. Yes.
Q. So whether or not the good laboratory compliance statement was signed and dated in the draft, is there any question that TNO was operating under good laboratory practices?

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MR. FAYNE: Object to form.
A. Not that I'm aware of.
Q. Okay. And is the draft, Exhibit 5, does it have the same quality assurance statement that is in the final report, except for the fact that in the draft it had not yet been signed and dated?
A. Yes, it does.
Q. Okay. Is there any indication anywhere in this draft or final report that the study was conducted under any circumstances other than under good laboratory practices?
A. Not that I'm aware of.
Q. If you would turn to page 18 of the final study, Exhibit 12.
A. Page 18?
Q. Yes. Where it says "Deviations of the protocol."
A. Yes, I have it.
Q. Okay. Monsanto counsel read the second paragraph, which ends with the statement, "Therefore, upon request of the sponsor, the experiment has not been performed using viable" skin -- "human skin membranes."
Do you see that?
MR. FAYNE: Objection. Mischaracterizes my question.

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A. I see that sentence. You read it correctly.
Q. Okay. In the initial protocol of the study, the initial design of the study, was there also going to be a human skin membrane dermal absorption portion of the study?
MR. FAYNE: Objection. Lacks foundation.
A. That was the original plan. It came out of Dr. Donna Farmer's office. There was $70,000 pledged to the work at TNO. And the rat skin penetration study, this initial one, and the initial human skin penetration study were the first of -- I think there were seven studies that were going to be done on different formulated products.
Q. Okay. So the final TNO report indicates that the experiment on the human skin membranes had not been done because of the variations in recovery?
MR. FAYNE: Are you reading from the report?
Q. I'm summarizing what appears before the sentence that says, "Therefore, upon the request of the sponsor."
A. When --
MR. FAYNE: Object to the characterization of the document.
THE WITNESS: When Monsanto received the draft report, a decision was made to terminate any further

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work with TNO, and that included the human skin membrane study that was going to be a part of the first contract, if you will.

Q. (BY MR. KRISTAL:) Okay. And did you write about the reason Monsanto articulated internally for stopping the study?

A. Yes. It's in my expert report.

Q. Okay. If you would turn to paragraph 444.

A. Okay. 444. Okay. 444, I'm there.

Q. Okay.

A. Page 98.

Q. And do you quote in paragraph 444 from an April 4th, 2002, e-mail from the Monsanto study monitor [redacted]

A. Yes, I do.

Q. Okay. And could you read the quote that you wrote in paragraph 444 of your report regarding why Monsanto decided to stop the study?

A. "We came to the conclusion that the penetration of glyphosate would have been (probably) greater than the 3 percent already imposed by the German authorities. We decided, thus, to stop" -- in capital letters, bolded -- "the study effective today."

Q. Okay. And was that statement contained from an e-mail produced by Monsanto in this litigation?

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A. Right. The MONGLY number is given in my expert report.

Q. Is the statement of the reason for stopping the study that was articulated internally with Monsanto consistent with the reason that appears in the final study report that we just read?

A. No.

Q. I want to talk to you about the line of questioning regarding the failure of EPA to make findings that Monsanto violated any regulations.

Do you generally recall those questions?

A. Yes.

Q. Okay. This may seem like a silly question, but let me ask it anyway. If a person robs a bank and doesn't get caught, does that mean that the bank wasn't robbed?

MR. FAYNE: Objection.

A. No.

Q. Okay. And the fact that EPA did not make a finding of violations of regulations, does that mean that Monsanto did not violate the regulations?

A. Not necessarily.

Q. Okay. If you look on page 391 -- I'm sorry. The worker safety provision portion of your report. I believe it's paragraph 399.

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A. I'm there.

Q. Okay. What were the worker safety provisions that the EPA was requesting Monsanto add to its label?

A. There were some requirements involving personal protective clothing and equipment, which included either goggles or a face shield, chemical-resistant gloves, a chemical-resistant apron, chemical-resistant shoes or shoe coverings or boots. That was the required personal protective equipment.

There's a provision on when that additional P -- it's PPE is the acronym for personal protective equipment -- a provision that specifies when such equipment is to be worn.

And then in terms of the handling, the management of the gloves, there's -- under "Important," it says, "Before removing gloves, wash them with soap and water. Always wash hands, face and arms with soap and water before smoking, eating, drinking or toileting."

And then there's a provision that refers to the handling of clothing that becomes contaminated or drenched with spray material.

"After work, wash protective clothing and equipment with soap and water. Any personal clothing worn during the application should be laundered

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separately from household articles," and that "Clothing or protective equipment that becomes heavily contaminated or drenched with glyphosate has to be disposed of in accord with state and local regulations," a language very reminiscent of what we read in the case of the label changes on Alachlor.

And it emphasizes, again, in all capitals, "Heavily contaminated or drenched clothing cannot be adequately decontaminated."

Q. Okay. Now, did Monsanto ever effectuate what EPA was requesting them to do with respect to putting those worker protection provisions in its label?

A. No, it -- no, it has not.

Q. You were asked a question as to whether the reason for that worker protective provisions related to skin irritation and eye irritation; correct?

A. Oh, it would be part of it.

Q. Okay. Would those worker protector provisions reduce all exposures to Roundup for whatever adverse effect Roundup might cause?

MR. FAYNE: Objection. Calls for speculation. Beyond the scope of his expert --

A. These worker protection standards were clearly designed to reduce exposure to the eye, calling for goggles or a face shield. They were also clearly

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designed to reduce exposures through -- through the hands.
Why is that making so much noise? I'm sorry. I'm just going to have to let it ring. I'll turn the thing off. Maybe that will do it. Yeah.
I'm sorry, could we -- could we go back to where I was --
Q. Sure.
A. -- before I was interrupted by my damn phone, my phone.
Q. I was asking if you remember the line of questioning about eye irritation and skin irritation vis-à-vis the request to put in the worker protection provisions, and I asked you if those provisions would also reduce exposures to Roundup regardless of the adverse effect.
MR. FAYNE: Same objection.
A. Yes, it would. They're designed to reduce exposure to the eyes, to the hands, to the skin, to the feet, to the legs, to the back and to the torso.
Q. If you would find Exhibit 16, please, in the pile. It's the October 1991 peer review of glyphosate.
A. 16?
Q. Yes, sir.
A. All right. I'm there. Making a mess of my

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nice pile. All right. Second peer review.
Q. Okay. And on the third page, Bates number 479.
A. I'm there.
Q. There's a section entitled, "Background information." Do you see that?
A. Yes.
Q. And the -- after the chemical formula for glyphosate, it reads, "On February 11th, 1985, the carcinogenic potential of glyphosate was first considered by a panel (then called the Toxicology Branch Ad Hoc Committee) comprised of members of the Toxicology Branch of the Hazard Evaluation Division. The committee, in a consensus review dated March 4th, 1985, classified glyphosate as a Group C carcinogen based on an increased incidence of renal tubular adenomas in male mice."
Do you see that?
A. Yes.
Q. Did Monsanto ever put on its label that Roundup or glyphosate had been classified as a Group C carcinogen?
A. No, it did not.
Q. If you turn to Exhibit 15, which is a February 24th, 1986, EPA memo.
A. 15. Okay. I have it.

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MR. FAYNE: Give me one second. Which one is that?
MR. KRISTAL: 15.
THE WITNESS: February 24, 1986. It's the --
MR. FAYNE: Yes, I got it now. Thank you.
MR. KRISTAL: On the page that ends Bates number 5517.
Q. (BY MR. KRISTAL:) The first full paragraph also gives a little bit of the history of the review of the database.
A. Correct.
Q. Does it not?
And it reads "The Federal Insecticide Fungicide and Rodenticide Act (FIFRA) Scientific Advisory Panel has completed review of the database supporting the Environmental Protection Agency's decision to classify glyphosate as a class C possible human carcinogen."
Do you see that?
A. Yes.
Q. Okay. How long did that classification remain in effect?
A. Through 1991.
Q. Okay. So in between this date of this classification as possible human carcinogen for the approximately six and a half years through 1991, was

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there ever any information provided by Monsanto on a Roundup label that glyphosate, the active ingredient, was classified as a possible human carcinogen?
A. No, there was not.
Q. Have you seen any information communicating this finding to the public in any way?
A. From Monsanto?
Q. From Monsanto, yes, sir.
A. No, I have not.
Q. Have you seen any advertisements that included a statement between the time in 1985 when it was classified by EPA as a possible human carcinogen until that classification change in 1991 indicating that it was classified as a possible human carcinogen?
A. No, not.
Q. Any brochures or presentations that stated that to users of Roundup?
A. No.
Q. Any sort of press release or announcement by Monsanto to any users of Roundup or the general public?
A. No.
Q. Is this statement of the finding of possible human carcinogen consistent with your opinion in paragraph 387 that as of 1985 Monsanto should have added at least an oncogenicity warning?

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A. Correct. And I suggested language that is similar to the language that they -- that Monsanto actually put on the Lasso or Alachlor label.

MR. KRISTAL: Okay. I'm going to mark as hopefully the last document, Exhibit 27.

(Exhibit 27 marked for identification.)

Q. (BY MR. KRISTAL:) Thank you. This is an EPA document dated March 16th, 2017. The subject is "Transmission of meeting minutes and final report of the December 13th through 16th, 2016 FIFRA SAP meeting."

Have you reviewed this document before?

A. Yes, I have.

Q. And did the SAP evaluate the environmental protection -- strike that.

"SAP" means what?

A. Scientific advisory panel.

Q. Okay. In this report dated March 16th, 2017, did the scientific advisory panel evaluate the Environmental Protection Agency's review of technical glyphosate?

A. Yes. That was the part of the focus of it, and there was a series of questions placed to the SAP, as is always done when a scientific advisory panel meeting is scheduled.

Q. And if you would kindly turn to page 18.

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A. Okay. I'm there.

Q. Did the entire SAP panel conclude that the EPA did not follow its own guidelines --

A. Yes.

Q. -- from 2005?

MR. FAYNE: Objection. Lacks foundation.

A. Yes, they did.

Q. Okay. And the next-to-the-last paragraph begins "Overall, the panel concluded that the EPA evaluation does not appear to follow the EPA 2005 cancer guidelines in several ways, notably for use of historical control data and statistical testing requirements."

Is that what the SAP, the scientific advisory panel, wrote in 2017?

A. Yes, that's what they concluded.

Q. Okay. Does the fact they concluded the EPA did not follow its own guidelines raise any concern in your opinion regarding the quality of EPA's assessment?

MR. FAYNE: Object to form.

A. Yes.

Q. Did the EPA ever explain why it didn't follow its own guidelines?

A. In -- in the September 2016 report, they present their arguments for the statistical tests that

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they relied on and their use of historical control data leading them to dismiss essentially all of the positive tumor data in all of the animal bioassays. So they -- in their document, they do their best to justify the conclusions that they reached based on their review of the animal bioassay data, and that's what -- that's what they then asked the SAP to review.

Q. Okay. But did the EPA itself explain why it didn't follow its own cancer guidelines?

A. No, they didn't mention that fact.

Q. Okay. To your knowledge, is there any indication that IARC failed to follow its guidelines as established in its preamble --

A. No.

Q. -- in terms of evaluating the carcinogenicity of glyphosate?

A. In their report, correct. I -- yes, there was no indication that they deviated from standard IARC protocols.

Q. Okay. Did the -- if you turn to page 82 of Exhibit 27, the SAP --

A. The same one we're in?

Q. Yes.

A. I'm there.

Q. There's a section entitled "Scientific quality

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of the agency's carcinogenic potential characterization."

Do you see that?

A. Yes, I do.

Q. Okay. And it reads in that first paragraph, "While the issue paper does try to detail the design and data limitation of each study selected, some of the panel believed it does not provide sufficient details to support its conclusions, and this negatively impacts the scientific quality of the report. In addition, many panel members felt that some of the discussions of study design and data limitations provided in the issue paper introduced and used criteria that were not part of EPA guidelines for these assessments, and this further reduces the credibility of the assessment."

Do you agree with the scientific advisory panel's conclusions here regarding the reduction in the credibility of the EPA's assessment?

A. Actually, I do agree with it.

Q. Did IARC consider real-world exposure to glyphosate-based herbicides for its classification of probable carcinogenicity for glyphosate?

MR. FAYNE: Object to form.

A. They did --

MR. FAYNE: And lacks foundation.

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THE WITNESS: They did in the context of their review of the epidemiological evidence, all of which involved exposures to glyphosate-based herbicides and real-world exposures, and they also did in the genotox assays involving exposed human populations who -- who were exposed to a glyphosate-based herbicide under real-world conditions.

Q. (BY MR. KRISTAL:) Have there been any questions today by Monsanto's counsel or by myself that leads you to change any of the opinions and conclusions expressed in your report in this case?

A. No.

MR. KRISTAL: I have no further questions unless --

MR. FAYNE: We can go off record for five minutes.

VIDEOGRAPHER: Off the record at 5:39 p.m.

(A brief recess was had.)

VIDEOGRAPHER: Back on the record at 5:47 p.m.

FURTHER EXAMINATION

BY MR. FAYNE:

Q. Dr. Benbrook, you were shown by counsel Exhibit 25, which relates to the chemical Alachlor; is that correct?

A. Alachlor.

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Q. Alachlor. Thank you. Is that correct?

A. Yes.

MR. FAYNE: I'm going to mark this as Exhibit --

MR. KRISTAL: 28.

MR. FAYNE: -- 28, which is the EPA R.E.D. Facts, which I believe is the Registration Eligibility Decision. Correct?

THE WITNESS: Correct.

(Exhibit 28 marked for identification.)

Q. (BY MR. FAYNE:) Have you seen this document before, Dr. Benbrook?

A. Yes.

Q. You're aware that in January 1985, EPA determined that Alachlor met or exceeded the agency's oncogenicity criteria?

A. They classified Alachlor as a B2 carcinogen. Is that what you're saying? I can't remember the exact date that they did it. It's probably in this document.

Q. And B2 carcinogen, that means probable human carcinogen?

A. Correct.

Q. Did the EPA ever classify glyphosate as a probable human carcinogen?

A. No.

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Q. Were you aware that EPA issued a notice of intent to cancel the registration of Alachlor?

A. Alachlor.

Q. Alachlor.

A. It's okay.

Q. I'll restate the question.

Were you aware that EPA issued a notice of intent to cancel the registration of Alachlor?

A. Probably back when I was doing research on corn herbicides I was aware of it, but I haven't gone back to review the record in preparation for this deposition.

Q. Were you aware that EPA required a label statement that Alachlor labels include the label warning "Restricted use due to oncogenicity, a tumor hazard warning"?

A. Yes.

Q. Did EPA ever require that glyphosate-based herbicide labels include a label warning for restricted use due to oncogenicity?

A. No.

Q. Did EPA ever require that glyphosate-based herbicide labels include a label warning for a tumor hazard?

A. No.

Q. Are you aware of any company including a cancer

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warning on a pesticide label in a situation other than when EPA required such a warning?

A. I can't think of one at this late hour. To say -- to say definitively how many there are, I'd have to go through and look at a lot of labels.

Q. Sitting here today, you're not aware of any pesticide company that has voluntarily placed a cancer warning on its pesticide products without being required to do so by EPA; correct?

A. I can't -- I can't point to one now.

Q. I'd like to direct you to exhibit -- I believe it's 21, the International Code of Conduct on Pesticide Management.

A. Okay.

Q. You were shown this document by counsel; correct?

A. Correct.

Q. Had you reviewed this document before today?

A. Multiple times.

Q. It's not listed in your reference list; correct?

A. I -- I don't know if it is or not.

Q. So you can't say one way or the other whether this document is listed in your reference list?

A. I can't.

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Q. Did you rely upon this document in forming your opinions in this case?
A. This is a -- this is a document that's been part of pesticide registration and the code of conduct internationally for 35 years, 40 years. It's -- it's one of thousands of documents that I've used and has informed my understanding of pesticide risk and regulation, stewardship obligations. And I apologize for not including on my reliance list everything that I've read in the last 40 years on pesticides.
Q. If you could turn to page 11, Article 4, Testing of Pesticides.
A. Page 11. Okay. I'm there.
Q. Section 4.1.2 states that, "A pesticide industry should ensure that such tests are conducted in accordance with sound scientific and experimental procedures and the principles of good laboratory and experimental practice"; correct?
A. Correct.
Q. You're not making any claim that Monsanto violated good laboratory practices in conducting studies on glyphosate; correct?
A. No, I have not.
Q. If you turn to 4.1.3, it states that, "Pesticide industries should make available copies or

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summaries of the original reports of such tests for assessment by responsible governmental authorities in all countries where the pesticide is to be offered for sale or use." Do you see that?
A. Yes.
Q. You would agree with me that IARC is not a governmental authority; correct?
A. Yes.
Q. IARC does not register pesticides; correct?
A. Correct.
Q. So IARC would not fit within the meaning of this paragraph 4.1.3; correct?
A. Correct.
Q. If you'd turn to 4.1.4, states that, "Pesticide industries should ensure that the proposed use, label claims and directions, packages, safety data sheets, technical literature and advertising truly reflect the outcome of these scientific tests and assessments"; correct?
A. Correct.
Q. You would agree that the Monsanto label is consistent with the findings of international regulatory bodies; correct?
MR. ESFANDIARY: Which ones?
Q. The -- in general, the labels on Monsanto's

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formulated products today are consistent with the findings of international regulatory bodies; correct?
MR. KRISTAL: Objection.
Q. Glyphosate formulations. I apologize. Let me restate the question.
In general, the find -- the labels on Monsanto formulations today are consistent with the findings of international regulatory agencies; correct?
MR. ESFANDIARY: Which ones under the formulations?
MR. KRISTAL: It's getting late. Don't worry.
Q. (BY MR. FAYNE:) It's getting really late. I apologize. I'll restate the question for the third time and this time I'm going to get it correct. I promise.
You would agree with me, Dr. Benbrook, at this late hour, that the labels on Monsanto's glyphosate-based formulations are consistent with the findings of regulatory agencies around the world with respect to cancer; correct?
A. Yes.
Q. You'd also agree that the California state agency OEHHA does not have authority to register pesticides in California; correct?
A. Correct.
Q. Does not have the authority to approve

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pesticide labels; correct?
A. Right. That's the California Department of Food and Agriculture that does that, DPR.
Q. You've testified that you've reviewed this document many times.
Does anywhere in this publication, which was issued by the World Health Organization, does it mention IARC in here?
A. I can't remember. I'd have to scan through it to give a definitive answer.
Q. You don't recall a statement in this publication by the World Health Organization that says that pesticide labels should be consistent with the findings of IARC; correct?
A. I'd have to look.
Q. So sitting here today, you can't say one way or the other; correct?
A. That's what I just said.
Q. So fair to say that to your knowledge this publication requires that labels be consistent with the findings of regulatory authorities around the world, but not IARC?
MR. KRISTAL: Objection.
A. This document requires that pesticide labels be consistent with what pesticide registrants, pesticide

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regulators, and the scientific community knows about the exposures and risks arising from use of pesticides.
Q. You were asked about worker safety language in the 1986 registration standard document; correct?
A. Yes, I was.
Q. Would you agree that that worker safety language is not present in the 1993 registration eligibility document for glyphosate?
A. I would agree with that, yes.
Q. You were shown a document, I believe it's Exhibit 27, which is a March 16th, 2017, the transmission of meeting minutes and final --
A. Right.
Q. -- report of the SAP?
A. Yep.
Q. You were asked whether -- I believe you were asked whether Monsanto -- strike that.
You were asked whether EPA addressed the comments of the SAP; is that correct?
Perhaps I'm incorrect.
I'm sorry. You were asked in this report, SAP stated that EPA did not follow its guidelines; correct?
A. Correct.
Q. And you were asked whether EPA ever explained why it didn't follow its guidelines; correct?

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A. I was asked that, yes.
Q. Have you reviewed the document in which EPA responded to the comments of the SAP?
A. No.
Q. Have you reviewed the 2017 -- December 2017 OPP report which was revised following the OPP -- the SAP meeting?
A. Are you talking about the draft human health risk assessment?
Q. I'm talking about EPA's December 2017 revised issue paper.
A. Please put it in front of me.
Q. I don't have it here today. This is the updated version of the 2016 report that we've been reviewing today.
A. Okay.
Q. Have you -- do you recall if you reviewed that document?
A. Yes, I have.
Q. Do you recall if that document addresses any of the issues raised by the SAP?
A. I believe it does, yes.
Q. And you're aware that EPA directly responded to the SAP in a formal memo; correct?
A. No, I haven't seen that memo.

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Q. So you're not aware that they affirmed their understanding that they disagreed with the SAP with respect to the guideline comments?
A. I'm not surprised to learn that they would stick to their guns on this.
Q. Did you review -- strike that.
Did you rely on this SAP document in forming your opinions in this case?
A. That -- that's the most recent SAP meeting, and, yes, I was aware of it. I haven't -- I haven't read the -- I don't think I've ever read it straight through, but I'm aware of it and aware of the major findings of it.
Q. Is it cited in your reliance list?
A. I don't know. I can't remember.
Q. I'd like to turn now to some questions that counsel asked you about Professor Parry.
A. Okay.
Q. And if I could, I would like to direct you to the EPA reporting requirements. And I apologize, I'm not sure which exhibit this is. This is the 40 CFR Part 159, Subpart D.
A. 11.
Q. Thank you. So if I could turn your attention to Exhibit 11. And as we talked about earlier today, if

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you look at Section 159.155.
A. 155?
Q. Yes, 155.
A. Okay.
Q. This section addresses when information must be submitted. And as we talked about earlier today, it provides seven categories of reportable information.
Do you see that?
A. Yes.
Q. So now I'd like to turn to 159.158, which is the section that counsel asked you about.
A. 158. Okay.
Q. Part A states, "Information which is reportable under this part must be submitted if the registrant" -- and then it goes on to describe who possesses that information; correct?
A. Yes, sir.
Q. So the information must be reportable under this part; correct?
A. Information that falls into these categories has to be reported, yes.
Q. When this -- the regulation says "Information reportable under this part," do you understand that to mean Part 159 of the Code of Federal Regulations?
A. Yes.

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Q. So the information must first be reportable under Part 159 of the Code of Federal Regulations; correct?
A. Correct.
MR. FAYNE: Going to mark one last exhibit today and then I'm done, I promise.
MR. KRISTAL: I've heard promises before at depositions.
MR. FAYNE: Number 28?
MR. KRISTAL: I think so. You marked the last one which was the --
MR. FAYNE: Yeah.
THE WITNESS: The EPA, the SAP report, and it is --
MR. KRISTAL: 27.
THE WITNESS: -- it's 27.
Q. (BY MR. FAYNE:) So I'm marking as Exhibit 28 an e-mail chain related to a meeting with Professor Parry, and this is cited in paragraph 492 of your report.
A. Okay. Just a second. And do I need to get my report out, too, do you think, or are we just going to talk about this document?
Q. No, we're just going to talk about this document.

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A. Okay. Shoot.
Q. So you're aware -- I think you testified earlier that you were not aware of any written reports from Dr. Parry after August of 1999; correct?
A. I would have to go back and check the dates of the various Parry reports. As what became clear earlier, there's a series of them.
It's not exactly clear to me which ones came at the same time, which ones are two parts of one report. And the record -- it's confusing to track the flow of Parry's reports. I'd have to go back and look at it in detail to give you a definitive answer.
Q. But you're aware that Monsanto and Dr. Parry continued to communicate after August 1999; correct?
A. I am aware of that, yes.
Q. And I'll represent to you that you stated in your report that there was a meeting in February 2001 between Dr. Parry and Monsanto; correct?
A. Correct.
Q. And you cite this document, which is an e-mail -- if you turn to the second page, it's an e-mail from [redacted] to Donna Farmer, William Heydens, [redacted] and copying William Graham dated February 16th, 2001?
A. Right. Oh, yes, I remember this one now, yeah.

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Q. So you've seen this document before; correct?
A. Yeah.
Q. And this is summarizing a meeting between Monsanto and Dr. Parry --
A. Right.
Q. -- that occurred in February 2001; correct?
A. Correct.
Q. So starting with the first paragraph, second sentence, it states, "The presentation of the results of the" Monsanto -- or I should say "MON 35050 study changed the mood because it clarified certain effects found in the Bolognesi and Peluso papers."
Did I read that correctly?
A. You read it correctly, yes.
Q. Do you know what the MON 35050 study is?
A. It's a study on that numbered Monsanto formulation. I believe that's original Roundup.
Q. That is the study that was designed to replicate and explain the findings of the Bolognesi and Peluso --
A. Yes.
Q. -- papers; correct?
A. Yeah. One of -- one of several.
Q. If you go to the "Results" section of the summary, it states that --

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A. Let me -- I want to read the intervening paragraphs.
Q. Sure.
A. Okay.
Q. So the "Results" section states that, "Acceptance that glyphosate is not genotoxic."
A. That's what it says.
Q. "Broad agreement that genotoxic results in some studies with surfactants arose due to oxidative damage rather than direct genotoxicity"; correct?
A. Correct. That's what it says.
Q. And then going down to the last bullet in that section, "No longer requested any studies on the final formulation."
Did I read that correctly?
A. Yes.
Q. As of February 2001, Dr. Parry agreed that glyphosate was not genotoxic; correct?
MR. KRISTAL: Objection.
A. I'm not willing to accept [redacted] summary of this meeting as accurately reflecting Parry's views.
Q. As of February 2001, Dr. [redacted] reported from a meeting that Dr. Parry had accepted that glyphosate is not genotoxic; correct?
MR. KRISTAL: Objection.

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A. [redacted] is reporting that his interpretation of what Dr. Parry said. And, in fact, if Dr. Parry had total changed his opinions about glyphosate and glyphosate-based herbicides and believed that they were not genotoxic, I'm quite sure that Monsanto would have continued to use him and make him a party of their third-party network, which they did not do.

So I do not believe that there was a substantial change in Dr. Parry's assessment of the studies that he reviewed discussed during this meeting.

Q. Are you aware of whether Monsanto continued to work with Dr. Parry after this February 2001 meeting?

A. I think there were -- I think perhaps even a whole 'nother year, there were some communications back and forth, yes. I don't know if you would -- if that would classify as "work with."

I think there was -- there was concern expressed about what Parry, independent of his association with Monsanto might say and do about what he had learned in the course of this consulting assignment that he had done with Monsanto. There's several messages that discuss what happens next in their association with Dr. Parry.

Q. You testified that Monsanto would have

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continued to use him. How do you know that Monsanto did not continue to use him?

Is that based on your review of the e-mails produced in this litigation?

A. Yes.

Q. And those e-mails stated that they were no longer using Dr. Parry as of what date?

A. I don't -- I don't remember, but certainly by 2003, there was -- I'm almost sure there was no -- essentially no more communication, at least not that I've seen in the record.

Q. You're not aware of any publication by Dr. Parry suggesting that glyphosate or glyphosate-based formulations were genotoxic; correct?

A. In peer-reviewed -- a peer-reviewed journal? No.

Q. Correct.

A. No, I'm not aware of any.

Q. Other than the three reports in 1999 that Dr. Parry produced, are you aware of any written study or publication in which Dr. Parry concluded that glyphosate was genotoxic?

A. I'm not aware of any. It could exist.

Q. After this February 2001 meeting between Monsanto and Dr. Parry, are you aware of any statement

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or communication from Dr. Parry indicating that he believed glyphosate was genotoxic?

A. I -- no, I don't believe I am. I would have to, again, look -- look back at the MONGLY documents that memorialize the interactions between Monsanto and Dr. Parry to give a definitive answer to that question.

Q. Same answer for glyphosate-based formulations; correct?

A. Yes.

Q. You stated that you're not willing to accept Dr. [redacted] interpretation of this meeting; correct?

A. Correct.

Q. Do you have any reason to believe that his summary of the meeting was inaccurate?

A. It -- it's impossible to, based on this cryptic summary of the meeting that occurred, to understand exactly what was discussed, what date it was presented, what aspects of studies Dr. Parry expressed a view on that [redacted] interpreted was different from the view that Parry expressed in his earlier reports. It's just -- it's not possible to render that judgment based on this cursory summary of the meeting.

Q. So it's not possible to review the e-mail and understand exactly what was said or what people's intent or motivation was; correct?

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MR. KRISTAL: Objection.

A. Correct.

Q. Under the "Actions" section, it states, "Complete the MON 35050 study with an intraperitoneal injection of the MON" M-O-N, "35035 formulation minus glyphosate."

Do you see that?

A. Yes.

Q. Do you know whether Monsanto completed that study?

A. I don't. I don't know if they did or not.

Q. You don't know one way or the other?

A. Right. Correct.

MR. FAYNE: No further questions.

MR. KRISTAL: For housekeeping purposes, I have two minutes of questions.

I believe you marked Exhibit -- the Alachlor EPA R.E.D. Facts as 28, so the e-mail that you've just been discussing should be 29, so I'll put 29 on that.

MR. FAYNE: Thank you. I appreciate that.

(Exhibit 29 marked for identification.)

MR. KRISTAL: And I'm assuming 28 made its way onto the Alachlor, and if it hadn't, we can do as well.

MR. FAYNE: All right. Actually, have you marked that version that you have that's stapled?

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MR. KRISTAL: That's mine. We'll make sure for housekeeping.
MR. FAYNE: Okay.
MR. KRISTAL: We don't have to delay Dr. Benbrook while we do the housekeeping.
MR. FAYNE: All right. Thank you.
MR. KRISTAL: Sure.
THE WITNESS: I'm quite proud of my together pile here. I've got 27, 28.
MR. KRISTAL: 28 is already on there.
THE WITNESS: 29, and that's bingo.
(Exhibit 23 marked for identification.)
MR. KRISTAL: Real quick. I marked as Exhibit 23 the printout from the Monsanto website that had the link to the International Code of Conduct on Pesticide Management, and --
THE WITNESS: That's the missing one.
MR. KRISTAL: Right.
MR. FAYNE: Do you mind if I take a quick look at it?
MR. KRISTAL: Sure.
MR. FAYNE: Whenever you're ready.
MR. KRISTAL: And Exhibit 23, just before the link, says, "We subscribe to international stewardship standards including the International Code of Conduct on

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Pesticide Management." And I want to --
THE WITNESS: It goes there when it's ready.
MR. KRISTAL: Yep. And I want to follow on Exhibit 21 just in the same section that Mr. Fayne had asked you questions.

FURTHER EXAMINATION

BY MR. KRISTAL:
Q. Under Article 4, Testing of Pesticides, Mr. Fayne asked you about Section 4.1.2 in terms of good laboratory practices; correct?
A. Correct.
Q. All right. 4.1 says, and 4.1.1 say, "Pesticide industries should ensure that each pesticide and pesticide product is adequately and effectively tested by recognized procedures and test methods so as to fully evaluate its inherent physical, chemical or biological properties, efficacy, behavior, fate, hazard and risk with regard to the various anticipated uses and conditions in regions or countries of use."
Do you see that?
A. Yes, I do.
Q. When it says, "ensure that each pesticide and pesticide product," is there a difference between the pesticide as an active ingredient and the pesticide product itself?

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A. Yes. The pesticide refers to the testing of the active ingredient, and pesticide product refers to the formulated or end-use product.
Q. Okay. So the pesticide, the active ingredient for Roundup is what?
A. Glyphosate.
Q. And the pesticide product is what?
A. Roundup and the various brands of Roundup.
Q. Okay. And has Monsanto ever done any carcinogenicity testing on Roundup itself, the pesticide product?
A. No, it has not.
Q. Okay. And is that a violation of this industry standard that Monsanto itself has adopted?
MR. FAYNE: Objection. Calls for a legal conclusion.
A. It falls short of full compliance with it, especially given all of the reasons to do it.
Q. And very briefly, Exhibit 28, the Alachlor EPA registration facts. It was mentioned that eventually Alachlor was classified as a B2 carcinogen; right?
A. Correct.
Q. Okay. But in the history here it says, a registration standard was issued for Alachlor on November 20th, 1984, dropping down, "The Registration

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Standard (1) stated that Alachlor was classified as an oncogen." Do you see that?
A. Yes.
Q. And so that was November 20th, 1984, and we saw from the 1985 --
A. '5.
Q. -- chemical guide that, very shortly after the finding that it was an oncogen, Monsanto put the warning on the Alachlor products; correct?
A. Correct.
MR. KRISTAL: No further questions.
MR. FAYNE: Let's take a one-minute break and then I might have one last question and I think we're --
THE WITNESS: I think I'm done. Okay? I mean, this can go on all night.
MR. FAYNE: Well, it can.
THE WITNESS: Let's do the question.
MR. FAYNE: Okay.
MR. KRISTAL: Do you have a question?
MR. FAYNE: Yeah, we're still on the record.

FURTHER EXAMINATION

BY MR. FAYNE:
Q. You testified previously that testing -- doing long-term cancer studies on a formulated product is not industry standard; correct?

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MR. KRISTAL: Objection.
A. Correct.
So that's your question? You asked -- you said you were going to ask one question.
MR. KRISTAL: Yeah. We're beyond seven hours anyway.
MR. ESFANDIARY: Counsel --
VIDEOGRAPHER: We can go off the record and I can let you know.
MR. FAYNE: That's fine.
THE WITNESS: Are we done?
MR. FAYNE: Yes, we can be done.
THE WITNESS: Thank you.
VIDEOGRAPHER: This concludes the videotaped deposition of Charles Benbrook, Ph.D. The time is now 6:18 p.m. We're going off the record.
(Discussion had off the record.)
(Off the video record.)
MR. KRISTAL: Earlier I had said that I was going to mark as Exhibit 24 the linked International Code of Conduct from Exhibit 23, the Monsanto website. We agreed that 24 was the 2014 -- well, was going to be marked as 24, was the 2014 international code, which was the same as Exhibit 21.
MR. FAYNE: So I --

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MR. KRISTAL: 24 does not get marked.
MR. FAYNE: And I would just say that we did not agree that they're necessarily the same document. I understand that you printed out the linked version, but...
MR. KRISTAL: Well, it had the same title. It had the same author. The --
MR. FAYNE: It had a different cover page, so as far as I'm concerned, not the same document.
MR. KRISTAL: Right.
MR. FAYNE: I haven't reviewed them in detail to be able to --
MR. KRISTAL: Okay.
MR. FAYNE: -- agree to that characterization.
MR. KRISTAL: Well, everybody can go onto the Monsanto website link.
MR. ESFANDIARY: I can send you the link later. You can authenticate it later.
MR. FAYNE: I'm sure. All I'm saying is I'm not agreeing --
MR. KRISTAL: Would you agree to look whenever you get a chance and then let us know if you agree so we don't have to go back and print it and put a number 24 on it? We can print it out after the deposition.
MR. FAYNE: I thought that's what you were

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going to -- I thought that's what's you're going to do.
MR. KRISTAL: That's fine. We'll do that, then. It's no big deal.
We will provide to the court reporter an electronic copy of 24, and we'll provide that to you as well.
MR. FAYNE: That would be great. Thank you.
MR. KRISTAL: Okay. Fair enough.
(Whereupon, the deposition of CHARLES BENBROOK, Ph.D., was concluded at 6:20 p.m.)
(Exhibit 24 marked for identification.)

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CERTIFICATE

I, AMY J. BROWN, Certified Court Reporter in and for the States of Idaho and Washington, Notary Public in and for the State of Idaho, do hereby certify:
That the foregoing deposition of CHARLES BENBROOK, Ph.D., was taken December 28, 2018, at the time and place herein stated;
That the witness was first duly sworn to testify to the truth, the whole truth, and nothing but the truth in the within-entitled cause;
That the foregoing is a true and correct transcription of my shorthand notes of said deposition transcribed by me or under my direction;
I further certify that I am not interested in the outcome of said action, nor connected with, nor related to, any of the parties of said action or to their respective counsel.
IN WITNESS WHEREOF, I have hereunto set my hand and seal this 29th day of December, 2018.

_____
AMY J. BROWN, RMR, CRR
Notary Public
My commission expires: 9/24/24

INSTRUCTIONS TO WITNESS

Please read your deposition over carefully and make any necessary corrections. You should state the reason in the appropriate space on the errata sheet for any corrections that are made.

After doing so, please sign the errata sheet and date it.

You are signing same subject to the changes you have noted on the errata sheet, which will be attached to your deposition.

It is imperative that you return the original errata sheet to the deposing attorney within thirty (30) days of receipt of the deposition transcript by you. If you fail to do so, the deposition transcript may be deemed to be accurate and may be used in court.

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ACKNOWLEDGMENT OF DEPONENT

I,_____, do hereby certify that I have read the foregoing pages, and that the same is a correct transcription of the answers given by me to the questions therein propounded, except for the corrections or changes in form or substance, if any, noted in the attached Errata Sheet.

_____
CHARLES BENBROOK, Ph.D. DATE

Subscribed and sworn to before me this _____ day of _____, 20____.
My commission expires:_____

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Notary Public

LAWYER'S NOTES

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