

JAN 15 1992

Depo of: GEORGE J. LEVINSKAS Monsanto v Aetna December 23, 1992

Page 162 to Page 259

ACE-FEDERAL REPORTERS, INC.

202-347-3700

CONDENSED TRANSCRIPT & CONCORDANCE
PREPARED BY:

ACE-FEDERAL REPORTERS, INC.
1120 G STREET, NW SUITE 500
WASHINGTON, DC 20005
Phone: 202-347-3700
FAX: 202-737-3638

Page 162

[1] - SUBJECT TO PROTECTIVE ORDER -
 [2] IN THE SUPERIOR COURT OF THE STATE OF
 [3] DELAWARE
 [4] IN AND FOR NEW CASTLE COUNTY
 [5] ----- x
 [6] MONSANTO COMPANY, :
 [7] Plaintiff, :
 [8] -vs- : CA No. 88C-JA-118-1-CV
 [9] AETNA CASUALTY & SURETY : C-1-90-492
 [10] COMPANY, et al., :
 [11] : Volume II
 [12] Defendants, :
 [13] ----- x

[13] DEPOSITION OF GEORGE J. LEVINSKAS
 [14] Wednesday, December 23, 1992
 [15] Wilmington, Delaware
 [16] Continued Deposition of GEORGE J. LEVINSKAS,
 [17] called for examination pursuant to agreement by
 [18] counsel, at the law offices of Elzufon, Austin &
 [19] Drexler, 21st Floor, 1201 Market Street, at 9:30 a.m.,
 [20] before CRAIG L. KNOWLES, Court Reporter, when were
 [21] present on behalf of the respective parties:
 [22] - continued -

Page 163

[1] APPEARANCES:
 [2] PETER J. WALSH, JR., ESQ.
 [3] Potter, Anderson & Corroon
 [4] 350 Delaware Trust Building
 [5] Wilmington, Delaware 18999
 [6] On behalf of the Plaintiff.
 [7] DAVID S. FLORIG, ESQ.
 [8] Manta and Welge
 [9] One Commerce Square, 37th Floor
 [10] 2005 Market Street
 [11] Philadelphia, Pennsylvania 19103
 [12] On behalf of the Defendant Liberty Mutual
 [13] Insurance Company.
 [14] MARILYN M. SANDBECK, ESQ.
 [15] Wiley, Rein & Fielding
 [16] 1776 K Street, N.W.
 [17] Washington, D.C. 20006
 [18] On behalf of the Defendant Travelers Indemnity
 [19] Co.
 [20]
 [21]
 [22]

Page 164

[1] C O N T E N T S
 [2] WITNESS EXAMINATION
 [3] George J. Levinskas
 [4] by Mr. Florig 5, 247
 [5] by Ms. Sandbeck 221
 [6] by Mr. Walsh 242
 [7] E X H I B I T S
 [8] LEVINSKAS DEPOSITION NUMBER IDENTIFIED
 [9] Exhibit 1 164
 [10] Exhibit 2 179
 [11]
 [12]
 [13]
 [14]
 [15]
 [16]
 [17]
 [18]
 [19]
 [20]
 [21]
 [22]

Page 165

[1] P R O C E E D I N G S:
 [2] Whereupon,
 [3] GEORGE J. LEVINSKAS,
 [4] was called for continued examination by counsel for
 [5] Defendants and, having been previously duly sworn by
 [6] the Notary Public, was examined and testified further
 [7] upon his oath as follows:
 [8] EXAMINATION BY COUNSEL FOR DEFENDANTS
 [9] BY MR. FLORIG:

[10] Q. Dr. Levinskas, good morning.
 [11] A. Good morning.
 [12] Q. We will try to get you out of here today as
 [13] early as we can.
 [14] You understand you are still under oath,
 [15] correct?
 [16] A. I do.
 [17] MR. FLORIG: Mark this as number 1.
 [18] (Deposition Exhibit 1 was marked for
 [19] identification.)
 [20] BY MR. FLORIG:
 [21] Q. Dr. Levinskas. You have in front of you what
 [22] has been marked as Levinskas number 1. I would just

Page 166

[1] like to ask you, is this a copy of your resume, or
 [2] c.v.?
 [3] MR. WALSH: You can take a minute to look at
 [4] it.
 [5] MR. FLORIG: Sure.
 [6] (Witness examines document.)
 [7] A. Yes.
 [8] BY MR. FLORIG:
 [9] Q. On the first page in the upper right-hand
 [10] corner there is an IBT number. Do you know what that
 [11] refers to?
 [12] A. I have not seen this, the heading on here. I
 [13] don't, I have no knowledge of it.
 [14] Q. Can you tell when this resume was prepared?
 [15] A. I do not recall a specific date. It does
 [16] have, among the references there is one dated 1977, so
 [17] it would either be 1977 or later.
 [18] Q. You will see on the first page under the first
 [19] heading, Business, it says, "Director, environmental
 [20] assessment and toxicology."
 [21] A. Yes.
 [22] Q. Do you see that?

Page 167

[1] A. Yes.
 [2] Q. I believe you told me yesterday you held that
 [3] position from approximately 1980 to 1986?
 [4] A. Yes.
 [5] Q. So this would have been prepared sometime in
 [6] the early to mid 1980s?
 [7] A. Well, as I said, the date I gave about '80 or
 [8] so for my title of director of environmental assessment
 [9] and toxicology, I am not too sure of the actual date on
 [10] which that change was made.
 [11] Q. All right.
 [12] A. But since this has a 1977, reference to a 1977
 [13] publication, I would say it was after 1977.
 [14] Q. Does the residence listed help you be more
 [15] definite?
 [16] A. We lived at Kirkwood until 1981, I believe.
 [17] Q. Did you prepare this, do you want to refer to
 [18] it as a resume or c.v.
 [19] A. Whichever you choose.
 [20] Q. Did you prepare this c.v., yourself?
 [21] A. I don't recall doing it, but I probably did.
 [22] Q. You can take as long as you need to look

Page 168

[1] through this.
 [2] What I would like to know is whether all of
 [3] the information contained therein was accurate at the
 [4] time this was written.
 [5] (Witness examines document.)
 [6] BY MR. FLORIG:
 [7] Q. I won't ask you to go through all of your
 [8] publications.
 [9] A. I believe it is.
 [10] I would like to go back and make two comments
 [11] relative to earlier testimony.
 [12] Q. Sure.
 [13] A. I think I indicated my first title at Monsanto
 [14] was manager of product -
 [15] Q. Development, I think you said.
 [16] A. Development. It was probably manager of
 [17] product safety.
 [18] Q. All right.
 [19] A. And in that same paragraph on page 3-19-71 to
 [20] present it says, let me go back here, make a reference

[21] to the planning and design of environmental health
[22] laboratory currently under construction in the vicinity

Page 169

[1] of the Washington Medical School. That would make me
[2] think that this was probably prepared more likely about
[3] '75 or '6.

[4] Q. All right.

[5] A. Or it could have been as late as '77.

[6] Q. That lab came on line in '77?

[7] A. I think it came on line in '77, so this was
[8] probably prepared about '75.

[9] Q. Okay.

[10] A. Well, I go back to that '77 publication, it
[11] would have to be early '77.

[12] Q. Was this c.v. ever circulated outside of
[13] Monsanto?

[14] A. I have no knowledge that it was.

[15] Let me back up. I did put together a c.v.
[16] which I had sent once or twice at request of people
[17] either in professional societies or where I had been
[18] invited to lecture. With those exceptions, which I
[19] sent a few times, I have no knowledge that this was
[20] sent out side of Monsanto.

[21] Q. Were the c.v. or c.v.'s of employees involved
[22] in toxicity testing ever attached to reports that were

Page 170

[1] sent outside of Monsanto?

[2] A. I have never attached them. I do not know
[3] what others may have done.

[4] Q. I want to direct your attention to page 3
[5] under the heading 1971 to present. In the second
[6] paragraph, the first sentence says, "Direct and
[7] supervise toxicology section of department which
[8] determines the need for, plans, monitors and evaluates
[9] all toxicity testing for the company."
[10] Do you see that?

[11] A. Yes.

[12] Q. Was it true in 1977 that you were involved
[13] with all toxicity testing?

[14] A. It was intended that all toxicity tests were
[15] to be placed through my section in the department.

[16] Q. All right.

[17] A. Let me modify that. We are talking now with
[18] respect to mammalian testing.

[19] Q. Didn't you say yesterday that the
[20] environmental sciences group may have been doing
[21] toxicity testing, as well?

[22] A. I indicated that there could be aquatic

Page 171

[1] testing or environmental fate testing that was being
[2] done elsewhere in the company.

[3] And also it would be a question of what
[4] timeframe are we talking about.

[5] Q. So there may have been toxicity testing going
[6] on within the company which you were not involved with,
[7] correct?

[8] A. I have no knowledge that there was, but there
[9] could have been.

[10] Q. One of the goals of toxicologists and
[11] industrial hygienists is the protection of people,
[12] correct?

[13] A. I am not prepared to speak to the goals of
[14] industrial hygienists. My efforts as a toxicologist
[15] are to, as I said, determine the need for, design,
[16] plan, implement, evaluate, test data and forward it to
[17] others with my interpretation or suggestions as to the
[18] significance and, on occasion, utility of the
[19] information. How it is used and how it is implemented
[20] by others, I do not know.

[21] Q. Do you have any understanding of why those
[22] people would request or need that information?

Page 172

[1] A. There could be a variety of reasons.

[2] Q. What would they be?

[3] A. One could be a regulatory requirement, which
[4] have gotten increasingly more stringent over the years.
[5] The other could be a - these are compared to existing
[6] products.

[7] Another goal would be to have information from
[8] which procedures could be developed to ensure the

[9] safety of employees, users of the product.

[10] Q. Those all lead ultimately to the protection of
[11] people, don't they?

[12] A. Yes.

[13] MR. WALSH: Excuse me, Dave, I assume that my
[14] standing leading objection continues today?

[15] MR. FLORIG: Yes.

[16] MR. WALSH: Thank you.

[17] BY MR. FLORIG:

[18] Q. Your answer was yes?

[19] A. One of the purposes is, yes, as I have
[20] indicated, to develop the information so that it can be
[21] used to assure the safety of the employees and the
[22] customers.

Page 173

[1] Q. And others who might come in contact with the
[2] material, is that true?

[3] A. I have some difficulty with that question. I
[4] can, not I, but the company, can send information with
[5] the product. And what happens to the - if the product
[6] and the information get separated at some future date,
[7] someone could come in contact with it somewhere. And
[8] if the information is not there, I don't know how that
[9] would be handled.

[10] Q. I want to ask you about several publications
[11] or texts that we didn't discuss yesterday. I just want
[12] to ask you if you are familiar with them.

[13] Are you familiar with a book by M. B. Jacobs
[14] entitled The Analytical Chemistry of Industrial
[15] Poisons, Hazards and Solvents?

[16] A. I have heard of the book, yes.

[17] Q. All right. Do you recall if you ever used or
[18] looked at the book?

[19] A. I may have glanced at it.

[20] But that is predominantly an analytical
[21] chemistry book. That is not my field of interest or
[22] expertise.

Page 174

[1] Q. How about a book by W. S. Spector entitled
[2] Handbook of Toxicology, Acute Toxicities of Solids,
[3] Liquids and Gases to Laboratory Animals?

[4] A. I have heard of the monograph. It is a, I
[5] think - I shouldn't say I think.

[6] I have heard of the monograph, but right now I
[7] have difficulty visualizing the nature of the book and
[8] its content.

[9] Q. You don't recall whether it was a compendium
[10] of chemicals and their toxicity evaluations?

[11] A. It's been some time since I have looked at the
[12] book, and I have difficulty, I just can't visualize the
[13] nature of the book or its content, I am sorry.

[14] Q. Do you recall whether either of the first two
[15] books that I mentioned were regarded as authoritative
[16] or respected within the toxicological profession?

[17] A. I cannot speak for others. I have indicated
[18] that I have knowledge of the books. Personally I do
[19] not recall using them very extensively.

[20] Q. Does that mean that you are unable to make an
[21] evaluation or you don't have an opinion?

[22] A. I cannot recall enough of either book to

Page 175

[1] comment on it at this time.

[2] Q. Next is a book edited by F. A. Patty,
[3] P-a-t-t-y, entitled Industrial Hygiene and Toxicology.

[4] A. Yes.

[5] Q. What can you tell me about that book?

[6] A. That is a rather extensive compendium. It has
[7] sections which deal with the general practice of
[8] industrial hygiene. It also has summaries of toxicity
[9] of various chemicals.

[10] Q. Was that a reference that was used throughout
[11] industry?

[12] MR. WALSH: Objection, calls for speculation.

[13] A. I do not know the extent of its use or
[14] distribution. I refer to the sections on chemicals in
[15] it fairly frequently.

[16] BY MR. FLORIG:

[17] Q. You view the information in there as reliable,
[18] as best you could tell?

[19] A. Many of the authors I know, have known

[20] personally, and I consider them to be competent
[21] toxicologists and I would accept their word as
[22] reliable.

Page 176

[1] Q. You mentioned yesterday a TLV Committee. Is
[2] that also referred to as the Committee on Threshold
[3] Limit Values?

[4] A. I believe they are the same.

[5] Q. Is that an arm of the American Conference of
[6] Governmental and Industrial Hygienists?

[7] A. Yes.

[8] Q. Are you aware of a publication by that
[9] committee entitled Documentation of Threshold Limit
[10] Values?

[11] A. Yes.

[12] Q. What can you tell me about that publication?

[13] A. Again, it is a compendium which provides
[14] summaries of the toxicology of the chemicals listed for
[15] which they have established so-called threshold limit
[16] values.

[17] Q. Is that regarded as reliable?

[18] A. OSHA adopted it for its permissible exposure
[19] limits, I guess that attests to its reliability.

[20] Q. Do you know when that committee started
[21] publishing TLVs?

[22] A. I do not know the specific year.

Page 177

[1] Q. Do you recall whether it was, when you were a
[2] graduate student, whether it was in existence at that
[3] time?

[4] A. I do not recall, as I indicated, the year it
[5] started, and I could not even make a reasonable guess
[6] as to when it started.

[7] Q. Next is a text by H. B. Elkins, The Chemistry
[8] of Industrial Toxicology. Are you familiar with that
[9] book?

[10] A. I know of the book.

[11] Q. Have you used it?

[12] A. I would - infrequently, very infrequently
[13] because it deals predominantly with chemical analysis.
[14] And I have indicated earlier that is neither my
[15] interest nor my specialty.

[16] Q. Next is a book by L. T. Fairhall entitled
[17] Industrial Toxicology.

[18] A. I know the monograph.

[19] Q. What can you tell me about that?

[20] A. My general recollection, it's a series of
[21] relatively short articles which combine some toxicology
[22] and some analytical chemistry.

Page 178

[1] Q. Did you regard that book as reliable?

[2] A. It probably is reliable. Because of the
[3] brevity, the smallness of the volume and brevity of the
[4] treatment, I did not find it very useful.

[5] Q. Is that because it was information that was
[6] already generally known to you?

[7] A. I think I had better sources. Patty would be
[8] one of those for comparable information.

[9] Q. Next is a book by H. W., perhaps it's Gerarde,
[10] G-e-r-a-r-d-e, entitled Toxicology and Biochemistry of
[11] Aromatic Hydrocarbons.

[12] A. Yes.

[13] Q. Are you familiar with that book?

[14] A. Yes.

[15] Q. What do you recall about that book?

[16] A. Dr. Gerarde was doing research on petroleum
[17] compounds, and that monograph is a result, compendium
[18] of much of the studies that he did.

[19] Q. Did you refer to that book?

[20] A. If I had petroleum compounds that were there,
[21] I would refer to that book.

[22] Q. Did you regard it as a reliable source of

Page 179

[1] information?

[2] A. Yes.

[3] Q. Next is a book by two authors, one, H.
[4] Gerarde, and the other W. D. Deichman, D-e-i-c-h-m-a-n,
[5] entitled Toxicology of Drugs and Chemicals?

[6] A. Yes, I know the monograph.

[7] Q. What do you recall about that book?

[8] A. It was a relatively short description of a
[9] variety of compounds. Its primary use was intended and
[10] I think its use was for treatment of acute exposure
[11] such as emergency room treatment for exposures to
[12] chemicals.

[13] Q. Did you have occasion to consult that book?

[14] A. I would look at it on occasion, but not
[15] regularly.

[16] Q. Did you view the information as reliable?

[17] A. Yes.

[18] Q. Next is a book by E. Browning entitled
[19] Toxicity of Industrial Organic Solvents. Are you
[20] familiar with that book?

[21] A. Yes.

[22] Q. What do you recall about that book?

Page 180

[1] A. I do not consult that very frequently, but my
[2] recollection is that they were somewhat extended essays
[3] on a variety of solvents.

[4] Q. Did you view that book as reliable?

[5] A. Yes.

[6] Q. Are you familiar with the term "synergy" as it
[7] applies to toxicology?

[8] A. Yes.

[9] Q. What does that term mean to you as applied to
[10] toxicology?

[11] A. To me, synergy would be an additive effect,
[12] one plus one equals two.

[13] Q. Is that different from how you would think of
[14] synergy in a non-toxicological context?

[15] A. That is my definition of synergy in all
[16] contexts.

[17] MR. FLORIG: Will you mark this as Exhibit 2
[18] (Deposition Exhibit 2 was marked for
[19] identification.)

[20] BY MR. FLORIG:

[21] Q. Dr. Levinskas, you have been handed what has
[22] been marked as Levinskas Exhibit 2. I don't really

Page 181

[1] think it's going to be necessary for you to read
[2] through the entire document. If you want to take a
[3] moment and refamiliarize yourself with it, that is
[4] fine.

[5] (Witness examines document.)

[6] BY MR. FLORIG:

[7] Q. Okay?

[8] A. Yes.

[9] Q. My first question is do you recall preparing
[10] this document?

[11] A. I don't recall preparing it, but - before
[12] looking at it. But, yes, I did prepare it.

[13] Q. You prepared it in December of 1973?

[14] A. I would say then or just before then.

[15] Q. You were making a presentation about safety
[16] aspects of Lopac containers?

[17] A. Yes.

[18] Q. Do you recall who attended that conference?

[19] Let me see if I can ask a better question. I

[20] don't want the names of people. Was it a presentation
[21] for people outside of Monsanto?

[22] A. Yes, this was for people outside of Monsanto.

Page 182

[1] Q. Was the entire conference focused on these
[2] Lopac containers?

[3] A. Yes.

[4] Q. What is a Lopac container?

[5] A. Lopac is a trade name for the plastic soft
[6] drink bottle we talked about yesterday, the beverage
[7] container.

[8] Q. You personally conducted some studies on that
[9] container, correct?

[10] A. I did a limited amount of study on it, yes.

[11] Q. Including burning?

[12] A. Yes.

[13] Q. Let me direct your attention to page 12. The
[14] first full paragraph, the third sentence reads, "It is
[15] also possible that simultaneous exposure to a mixture
[16] of combustion products could result in a synergistic
[17] action, i.e., a greater toxicity than that which would
[18] be expected from the simple additive effects of each

[19] compound."
 [20] Do you see that?
 [21] A. I do.
 [22] Q. Is that consistent with the definition I have

Page 183

[1] synergy that you just gave me?
 [2] A. No.
 [3] Q. Can you explain what the inconsistency is?
 [4] A. The term "synergistic," at one time I took -
 [5] I had different people express different
 [6] interpretations. Some refer to synergism as additive,
 [7] some refer to it as greater than additive. This
 [8] troubled me. So I went through just about every
 [9] pharmacology textbook I could get my hands on to look
 [10] up the definition of synergism.

[11] Q. All right.
 [12] A. I found that there was no consistency in the
 [13] term as it was being used by different people. I
 [14] thereupon decided that the original definition that I
 [15] had in grad school of synergy was additive. I decided
 [16] I would stay with that.
 [17] Some say additive, some say greater than
 [18] additive. I decided, it would have probably been about
 [19] this time, insofar as possible in the future I would
 [20] avoid using the term "synergy."
 [21] Q. In this presentation you referred to it as
 [22] greater than simply additive, correct?

Page 184

[1] A. Yes. I think I am reflecting the confusion
 [2] that I believe exists because of the various
 [3] definitions in the various textbooks.
 [4] Q. Today you believe in the simple additive
 [5] definition of synergy?
 [6] A. If I were to use the term, and I avoid it as I
 [7] have indicated, I would prefer to simply say additive
 [8] or greater than additive.

[9] Q. All right.
 [10] A. Or on occasion it may be less than additive.
 [11] Q. In your experience can exposure to two toxic
 [12] materials produce a greater than additive toxic effect?

[13] A. I think I just indicated it could be additive,
 [14] greater than additive or less than additive.
 [15] Q. Your experience has shown all three?
 [16] A. I have not thought of it in those terms, but I
 [17] think I could say yes.

[18] Q. You can put that aside.
 [19] Are you familiar with the term "persistence"
 [20] as it applies to chemicals?

[21] A. Again, persistence is a descriptive term, and
 [22] people have their own definitions of it.

Page 185

[1] Q. What is yours?
 [2] A. Persistence would have to be in some context.
 [3] Obviously a chemical in a bottle I would hope is
 [4] persistent.

[5] Q. In a bottle are some chemicals more persistent
 [6] than others?

[7] A. This goes to the question of persistence. If
 [8] I have a bottle of a chemical, I would like some
 [9] assurance that that chemical will be there or that what
 [10] I get out of that bottle is that chemical when I take
 [11] that bottle off the shelf.

[12] If it's not persistent, then it's not a useful
 [13] chemical or it's not useful to keep that chemical for
 [14] that purpose.

[15] Q. Is it true that some chemicals staying in the
 [16] bottle, is it true that some chemicals will persist
 [17] longer than others in that environment?

[18] A. I think that is true, yes.

[19] Q. Does persistence refer to the property of a
 [20] chemical or a compound maintaining its identity over a
 [21] period of time?

[22] A. I think I have indicated one would have to put

Page 186

[1] persistence in some context. For instance, if one buys
 [2] a drug, you will have an expiration date. Now why it
 [3] has an expiration date with an admonition not to use it
 [4] beyond that date, it could be any one of several
 [5] reasons.

[6] So when you talk of persistence, I think you

[7] have to talk of persistence in some situation or some
 [8] context.

[9] Q. Let's talk about the outdoor environment.

[10] Will some chemicals or compounds, if buried in the
 [11] ground, maintain their identity longer than others?

[12] A. I think that has been demonstrated, yes.

[13] Q. Would you refer to that as their persistence?

[14] A. Some -

[15] Q. In the environment?

[16] A. Yes, some have called it persistence in the
 [17] environment.

[18] Q. Would you call it that? If there is another
 [19] better term -

[20] A. Salt exists in the ocean. You can say salt is
 [21] persistent in the ocean. I think it's a question of
 [22] how one wants to apply the term and the sort of

Page 187

[1] situation one has to describe.

[2] Q. During the time that you worked for Monsanto
 [3] would you have wanted chemicals or materials known to
 [4] have toxic properties to be dumped or stored in soil or
 [5] ground-water?

[6] MR. WALSH: Objection to the question as vague
 [7] and broad, lacks any specificity.

[8] A. I don't see that what I would want or might
 [9] not want, I don't think it has any relevance.

[10] BY MR. FLORIG:

[11] Q. Well, Dr. Levinskas, you are not here to
 [12] determine what is relevant, you are here to answer
 [13] questions. And I would like you to answer the question
 [14] that I asked.

[15] A. I have indicated that sodium chloride persists
 [16] in the environment. If we had sodium chloride and
 [17] somebody was going to throw it out on the ground for
 [18] melting snow or putting it into a pit, I don't think I
 [19] would have any objection to that.

[20] Q. How about the same question for acrylonitrile?

[21] A. My understanding of acrylonitrile is it's a
 [22] flammable substance and it's volatile. And to put

Page 188

[1] liquid acrylonitrile in a pit would run serious risks
 [2] of fire, so forth.

[3] I would, one would have to consider that
 [4] circumstance and a lot of other things before one could
 [5] make a comment on it.

[6] Q. Putting aside fire, during the time you worked
 [7] for Monsanto would you have wanted acrylonitrile to be
 [8] dumped into soil or ground-water?

[9] A. I would not want any untreated waste dumped
 [10] into water.

[11] Q. That would include ground-water?

[12] A. Yes. I would not want it dumped into water.
 [13] And as I have indicated, I don't know what the
 [14] regulations, whether they would permit open burning or
 [15] not, but I would not want a flammable liquid placed in
 [16] an open vessel or open areas where it could catch fire.

[17] And in addition to which acrylonitrile has
 [18] acute toxicity, so I think before one could even
 [19] speculate on that one would have to know a variety of
 [20] things.

[21] Q. Is it fair to say that during the time you
 [22] worked for Monsanto you would not want materials known

Page 189

[1] to have acute toxicity dumped into soil or
 [2] ground-water?

[3] A. I did not make that generalization. I
 [4] indicated that in response to your question on
 [5] acrylonitrile.

[6] Q. Now I am asking a new question.

[7] A. One would have to define "acute toxicity."

[8] Q. Can you define "acute toxicity" for me?

[9] A. I indicated, table salt in sufficiently high
 [10] doses can be acutely toxic.

[11] Q. Yes.

[12] A. To man and animals. I would not have
 [13] objections to sodium chloride. Which is table salt,
 [14] being used either to melt ice or dumped into a pit.

[15] Q. Acrylonitrile you would have problems with
 [16] because of its acute toxicity?

[17] A. I have indicated its flammability, its acute

[18] toxicity. And also it is a skin irritant.
 [19] Q. What would your answer be to that question if
 [20] the material involved were trichloroethene?
 [21] A. I think I would want to know how much, where,
 [22] why, alternates, alternate routes of disposal, and

Page 190

[1] would hope that the individual or would remind the
 [2] individual that he should consider existing regulations
 [3] if any which might govern those actions.

[4] Q. What would your answer be for dichloroethene?

[5] A. Similar to the one I have just given.

[6] Q. Trichloroethene has toxic properties, correct?

[7] A. It has some manifestation of toxicity in
 [8] animals, yes.

[9] Q. How about in humans?

[10] A. I really have no direct knowledge of its
 [11] effect on humans.

[12] Q. During the time that you worked for Monsanto,
 [13] would you have wanted chemicals or materials known to
 [14] have toxic properties to be disposed of in a manner
 [15] such that they could commingle with other chemicals and
 [16] materials known to have toxic properties?

[17] A. There could be times when it might be
 [18] beneficial to mix wastes; there could be times when it
 [19] might be not desirable.

[20] Q. If there were the potential that those wastes
 [21] in commingling would have more than a simply additive
 [22] effect, would you consider it to be good practice to

Page 191

[1] dispose of those chemicals in a manner in which they
 [2] could commingle?

[3] A. To have additive effects there would have to
 [4] be some finite concentrations of the chemicals that
 [5] would have to be exceeded. If the concentrations to
 [6] produce those effects were not exceeded it could be
 [7] permissible.

[8] Q. When you say permissible, are you referring to
 [9] regulatory permission?

[10] A. It could include regulatory permission. It
 [11] may not have been the best term. As I indicate, it may
 [12] be practical, and it may also be permissible or legally
 [13] permissible.

[14] Q. During the time you worked for Monsanto would
 [15] you have wanted chemicals or materials known to have
 [16] toxic properties to humans to be disposed of or stored
 [17] in such a way that they could migrate through soil or
 [18] ground-water?

[19] A. Again, depending on the dose involved, just
 [20] about every chemical can show some toxicity to -- and
 [21] so it's such a broad question that I don't think it's
 [22] capable of a single simple answer.

Page 192

[1] Q. What if the quantity that was migrating
 [2] through the soil or the ground-water was unknown?

[3] MR. WALSH: Let me note an objection to this
 [4] whole line of questioning as hypothetical and broad,
 [5] vague and abstract.

[6] A. I guess I would have to break my response to
 [7] that into two parts. You know, in a once-upon-a-time
 [8] fashion, other than prohibitions on dumping into
 [9] flowing water streams, there was virtually no
 [10] consideration given by anybody, that includes the
 [11] government regulation -- government agencies,
 [12] individuals, about ground-water contamination. At that
 [13] time things were done in one manner.

[14] At a later date when one became conscious of
 [15] the potential for ground-water contamination,
 [16] considerations were taken in that respect.

[17] Again, it would take knowledge of a variety of
 [18] factors to determine whether or not such an action
 [19] might be considered as -- well, whether such an action
 [20] might be considered. One would have to take a lot of
 [21] other material into consideration.

[22] BY MR. FLORIG:

Page 193

[1] Q. Do you know approximately what time the
 [2] dividing line came between when no consideration was
 [3] given to ground-water contamination and some
 [4] consideration was given to it?

[5] A. I don't know that there was a definite time

[6] line that I am aware of. It was like many other
 [7] things, a growing consciousness and increasing
 [8] awareness, it started somewhere and got to be much more
 [9] prominent.

[10] But I can't really give you a timeframe in
 [11] which that developed.

[12] Q. Can you give me an approximation?

[13] A. In the general terms, I don't think I could
 [14] even begin to guess. There undoubtedly are people who
 [15] felt this was a problem earlier and there are people
 [16] who felt it was a problem later. Really, I am unable
 [17] to provide any information on that.

[18] Q. How is it that you know that there was a time
 [19] when no consideration was given to ground-water
 [20] contamination?

[21] A. As a youngster I grew up in the city of
 [22] Hartford, we had the Hartford River running right

Page 194

[1] through the capital grounds. There were a lot of
 [2] machine shops. And I can see the oily wastes still
 [3] comes out of the outfall pipes into that river which
 [4] fed directly into the Connecticut River.

[5] When I came back out of the service much of
 [6] that had ceased. That is with respect to contamination
 [7] of free flowing water.

[8] So since then it's gotten, one reads in the
 [9] newspaper about incidents of contamination or one
 [10] reads, hears anecdotes on the newspapers. And
 [11] somewhere along, as I say, consciousness has grown.
 [12] But I cannot put a timeframe on it.

[13] Q. The period you referred to in Hartford was the
 [14] 1940s, correct?

[15] A. It would have been the mid, late '30s. That
 [16] was as I say direct discharge into a flowing water
 [17] stream, which in turn led to another body of water
 [18] which ultimately went out to Long Island Sound.

[19] Q. You have been familiar throughout your
 [20] professional career that liquids tend to soak into
 [21] soil, correct?

[22] A. I don't think I had thought of it in those

Page 195

[1] terms. Certainly volatile liquids will evaporate. I
 [2] have not thought in terms of just how deep they would
 [3] soak in.

[4] Q. Rain soaks into the ground unless it is
 [5] saturated, correct?

[6] A. Much of it soaks into the ground; some of it
 [7] still evaporates.

[8] Q. You have known that throughout your
 [9] professional career, correct?

[10] A. I am not sure when I became conscious of it,
 [11] but I probably did.

[12] Q. Could you go through for me the factors that
 [13] you would want to consider for deciding whether
 [14] disposal of toxic materials in soil or ground-water was
 [15] a reasonable method of disposing of them?

[16] A. Since my own professional development and
 [17] experience has changed over the years and since
 [18] societal standards regarding the acceptability and
 [19] non-acceptability of such actions has changed, I think
 [20] it would be difficult to answer without some reference
 [21] to a specific timeframe.

[22] Q. Let's start with the 1950s.

Page 196

[1] A. Insofar as I can recall the 1950s, there were
 [2] waste pits, open lagoons and ground disposal was
 [3] probably used reasonably well by many people. I don't
 [4] recall anybody being overly concerned about how they
 [5] disposed of wastes. They would burn them, bury them or
 [6] disperse them.

[7] Q. What would you want to know about the waste
 [8] and the location in which it was being disposed in the
 [9] 1950's?

[10] A. I don't recall being asked any questions about
 [11] disposal of wastes in the 1950s. I doubt that I would
 [12] have given any thought to it.

[13] Q. Would you have been totally indifferent to
 [14] what was being disposed?

[15] A. I don't know what my reaction would be. I
 [16] don't think I was asked that question and I don't

[17] think, I didn't given it any thought. So I don't know
[18] what my response would be.

[19] Q. Were you interested in the 1950's in
[20] protecting people from potential exposure to known
[21] toxic materials?

[22] MR. WALSH: Object.

Page 197

[1] A. Yes.

[2] MR. WALSH: I object to the question as vague.
[3] Are you talking about in general, or him in particular?

[4] MR. FLORIG: Him in particular.

[5] MR. WALSH: All right.

[6] A. I had that interest with respect to the
[7] occupational work force, yes.

[8] BY MR. FLORIG:

[9] Q. Did you have that interest with regard to
[10] those other than the occupational work force?

[11] A. Prior to coming to Cyanamid in '58 when we
[12] started dealing with pesticides, that would have a more
[13] general potential exposure, I probably did not think
[14] much beyond the occupational work force. I can't
[15] recall, but I don't think it was a major or any
[16] overriding concern of mine.

[17] Q. Was that also true at Cyanamid and Monsanto?

[18] A. No, I indicated when I came to Cyanamid and we
[19] had pesticides, which had a broader population,
[20] potential population exposure, then I began to think
[21] more in terms of the user of the product.

[22] Q. And that is also true for your career at

Page 198

[1] Monsanto?

[2] A. Over the years at Monsanto we have gotten more
[3] concerned, I have gotten more concerned with the casual
[4] contact with chemicals, yes.

[5] Q. Throughout your career as a toxicologist
[6] wouldn't you have always wanted to control the
[7] potential for exposure of workers to chemicals and
[8] materials known to have toxic properties to the
[9] greatest extent possible?

[10] A. I have not been in the control side of the
[11] operation. I have indicated earlier that my function
[12] is to develop testing procedures or undertake tests to
[13] develop information to evaluate the information and to
[14] pass it on to those who would be dealing with controls,
[15] recommendations and suggestions as to the significance
[16] of that data and what might be done with it.

[17] Q. One of the primary reasons that your
[18] profession was needed within industry was so that
[19] others could control potential exposure to workers, is
[20] that true?

[21] A. I don't see a connection between the two, in
[22] the sense that you did it.

Page 199

[1] I have indicated that the toxicologist is
[2] responsible for the development and evaluation of the
[3] data. The overall protection of the workers is a
[4] multi-faceted operation which includes among mundane
[5] things of giving physicals to people which we do not
[6] indulge in. So there are many people involved in the
[7] operation.

[8] Q. And their primary goal was to protect workers
[9] from potential exposure, those groups working in
[10] unison, correct?

[11] A. I think I indicated in yesterday's testimony,
[12] it's the - my interpretation is that we would prefer
[13] not to expose people, or we do not expose people in
[14] that sense.

[15] But we recognize that in using, working with
[16] chemicals, people will be exposed. So it is to make a
[17] determination or an estimation as to whether the
[18] exposures are likely to be harmful or not to the
[19] individuals.

[20] Q. In making that evaluation you want to know
[21] what the potential exposures are?

[22] A. That would be an element to consider, yes.

Page 200

[1] Q. If the acute and chronic exposures to workers
[2] were unknown, would that be of concern to the groups
[3] working together to foster employee safety?

[4] A. There undoubtedly are many chemicals to which

[5] people are exposed that the degree of exposure to which
[6] is unknown.

[7] One would, in many cases one is not able to
[8] measure exposure, so one, in addition to operating
[9] practices and protective equipment, attempts to
[10] minimize exposure.

[11] MR. FLORIG: Why don't we take a short break.

[12] (Recess.)

[13] MR. FLORIG: Back on the record.

[14] BY MR. FLORIG:

[15] Q. Dr. Levinskas, let me ask you about some
[16] classes of chemicals and see what you know about them.

[17] Are you familiar with a class of chemicals

[18] known as chlorinated hydrocarbons?

[19] A. I have some knowledge of those.

[20] Q. What exactly are chlorinated hydrocarbons?

[21] A. A hydrocarbon is a chemical that contains
[22] basically hydrogen and carbon. There are varieties of

Page 201

[1] them, large numbers of them.

[2] In some cases the hydrogens can be replaced by
[3] chlorines, in that case you would have a chlorinated
[4] hydrocarbon.

[5] Q. Do chlorinated hydrocarbons have any toxic
[6] properties, or is it dependent on the individual
[7] hydrocarbon?

[8] A. I think I have indicated every chemical under
[9] some conditions at some dose level will have a toxic
[10] effect.

[11] Q. Right. What are some of the toxic effects of
[12] chlorinated hydrocarbons?

[13] A. One would have to be more specific. They can
[14] be, chlorinated hydrocarbons can be liquids or solids
[15] or gasses.

[16] Q. Do each of those have their own distinct toxic
[17] effects?

[18] A. Since there is a great variety of chemicals in
[19] that category, different members have different
[20] toxicity effects, not necessarily related to the
[21] physical state alone.

[22] Q. Let me ask you about vinyl chloride. Was

Page 202

[1] vinyl chloride known to have some toxic effects on
[2] humans back in the 1950's?

[3] A. My recollection is that at one time vinyl
[4] chloride was considered for use as an anesthetic gas,
[5] among other things. And it was not used because it did
[6] have an adverse effect on people that you would try to
[7] use it for an anesthetic.

[8] So I would say, yes, it's known to have toxic
[9] effects.

[10] Q. That was known back in the 1950's?

[11] A. I can't be sure. I don't recall just when I
[12] picked that information up.

[13] Q. Do you recall if vinyl chloride is also a skin
[14] or eye irritant?

[15] A. I have not worked with vinyl chloride. I do
[16] not recall the precautionary labeling on it, but it may
[17] be, I do not know.

[18] Q. That would be a chemical that was commonly
[19] referred to in those texts we talked about earlier and
[20] periodicals?

[21] A. After it got to be a substantial, or an
[22] article of commerce more than a curiosity, I am sure it

Page 203

[1] would be included in those texts.

[2] Q. Is benzene known to have some toxic effects on
[3] humans?

[4] A. Yes.

[5] Q. Was it known to have toxic effects back in the
[6] 1940s and 50's?

[7] A. I don't know how far back that information has
[8] been known.

[9] Q. Again, benzene would be something that is
[10] referred to in the literature and in the texts and
[11] references we talked about, correct?

[12] A. Commonly referred to, yes.

[13] Q. Do you recall what the toxic effects of
[14] benzene are?

[15] MR. WALSH: Can you specify a timeframe,

[16] because that might be important.
 [17] MR. FLORIG: Now.
 [18] MR. WALSH: I am sorry?
 [19] MR. FLORIG: Now.
 [20] MR. WALSH: Now, okay.
 [21] A. The most significant effect of benzene in my
 [22] opinion is that high level exposures will produce

Page 204

[1] destruction of the bone marrow, and that that has been
 [2] the significant health effect that people have
 [3] monitored for.

[4] Just casual reading of the literature, there
 [5] are some questions that have been raised as to whether
 [6] or not benzene might produce cancer in animals, and
 [7] people are beginning to consider benzene as a
 [8] carcinogen based on human data which is being highly
 [9] debated.

[10] Q. At least within animals benzene has been
 [11] associated in some studies with leukemia, correct?

[12] A. My recollection is that there are some mouse
 [13] studies suggestive of leukemia. The quality of the
 [14] evidence is in dispute among scientists.

[15] Q. Back in the 1950's was benzene known to be a
 [16] skin irritant or an eye irritant?

[17] A. Benzene is a solvent, it would be an eye and
 [18] skin irritant.

[19] Q. That would have been known back then?

[20] A. Yes.

[21] Q. Has it also been associated with respiratory
 [22] problems?

Page 205

[1] A. It's a volatile liquid, in high enough
 [2] concentrations it could cause respiratory distress.

[3] Q. Let me go back to a couple of the chemicals I
 [4] mentioned a little while ago. Trichloroethene, is that
 [5] material known to have toxic effects on humans?

[6] A. I am not overly familiar with the toxicology
 [7] of trichloroethene. I do not, cannot specifically
 [8] recall what effects it might have on humans.

[9] Q. That is part of a class of chlorinated
 [10] solvents?

[11] A. It is a chlorinated hydrocarbon and a liquid,
 [12] yes.

[13] Q. Is dichloroethene known to have any toxic
 [14] effects on humans?

[15] A. I would give a similar answer, I have not
 [16] worked with dichloroethane --

[17] Q. "Ethene."

[18] A. "Ethene." I am not familiar with what effects
 [19] it might have on humans.

[20] Q. That again is a chlorinated solvent?

[21] A. Yes.

[22] Q. Is trichloroethane known to have toxic effects

Page 206

[1] on humans?

[2] A. I think trichloroethane was introduced as a
 [3] substitute for carbon tetrachloride. Carbon
 [4] tetrachloride does have liver effects in people and the
 [5] expectation was that trichloroethane would be less
 [6] harmful with respect to the liver

[7] Q. Are you familiar with what the toxic
 [8] properties of trichloroethane are?

[9] A. I could not recite them in any great detail,
 [10] other than a very generalized knowledge of solvents.

[11] Q. Do you know if the expectation regarding
 [12] trichloroethane was proven to be correct, that it would
 [13] be less toxic?

[14] A. I have no basis for commenting on it.

[15] Q. Again, that is a chlorinated solvent?

[16] A. Yes.

[17] Q. Do you know what the toxic effects on humans
 [18] are of dichloroethane, also known I believe as ethylene
 [19] dichloride?

[20] A. I do recall that ethylene dichloride has been
 [21] used as a local anesthetic from my pharmacology
 [22] studies. Beyond that I really don't have specific

Page 207

[1] knowledge on the compound other than the general
 [2] knowledge of chlorinated hydrocarbons.

[3] Q. Ethylene dichloride was known, then, to have

[4] some toxic effect on humans in the 1940s or early
 [5] 1950's?

[6] MR. WALSH: Objection to form, misstatement of
 [7] the testimony, if that is what you are purporting to
 [8] do.

[9] A. My recollection of ethylene dichloride is,
 [10] when we studied about it in graduate school, is that if
 [11] a stream is directed on to a local site, local tissue,
 [12] and held there, it will evaporate so quickly that it
 [13] will actually freeze the tissue. So that with respect
 [14] to freezing of tissue, if that can be considered a
 [15] toxic effect I would say yes, that was known certainly
 [16] in the 1950's.

[17] BY MR. FLORIG:

[18] Q. Do you know if any other toxic effects were
 [19] known at that time?

[20] A. As I indicated in my earlier answer, that is
 [21] my specific recollection on ethylene dichloride, and I
 [22] don't recall anything beyond general knowledge of

Page 208

[1] organic solvents.

[2] Q. Are you familiar with aluminum chloride?

[3] A. I have heard of the chemical, yes.

[4] Q. Do you know if there are any toxic properties
 [5] associated with aluminum chloride?

[6] A. My recollection is aluminum chloride is an
 [7] astringent. It's the material that appears on the
 [8] styptic pencils you use when you cut yourself to stop
 [9] bleeding. I would say my knowledge is probably limited
 [10] to that fact.

[11] Q. Do you know of any toxic properties to humans
 [12] associated with calcium formate?

[13] A. No.

[14] Q. Does that mean no, you are not familiar, or
 [15] no --

[16] A. I have no knowledge of such.

[17] Q. Are you aware of any toxic properties
 [18] associated with chlorobenzene?

[19] A. In general terms, chlorobenzene would be
 [20] comparable, in short-term effects, to benzene.

[21] Q. What about long-term effects?

[22] A. I don't have a basis for making a comparison.

Page 209

[1] Q. Would the short-term effects of chlorobenzene
 [2] have been known to some degree back in the 1940s and
 [3] 50's?

[4] A. I don't know when that information was
 [5] developed.

[6] Q. When did you become aware of it?

[7] A. Probably general reading on review articles
 [8] somewhere along the line, but I can't comment for sure.

[9] Q. Do you recall if that was at the University of
 [10] Pittsburgh or American Cyanamid?

[11] A. I am unable to state when.

[12] Q. Are you aware of any toxic effects to humans
 [13] associated with hydrogen cyanide? This should be a
 [14] simple one.

[15] A. Yes.

[16] Q. What do you know about the toxic effects of
 [17] hydrogen cyanide?

[18] A. Cyanide is a characteristic poison in most
 [19] detective stories, prussic acid. It interferes with
 [20] the oxygen carrying capabilities --

[21] I take that back. It interferes with the

[22] utilization of oxygen by tissues and, therefore, can

Page 210

[1] cause death in high enough doses.

[2] Q. Those toxic effects have been known for a
 [3] long, long time, correct?

[4] MR. WALSH: Objection to form, in particular,
 [5] "a long, long time."

[6] A. I don't know specifically when that
 [7] information was developed, but it has been used when I
 [8] was in graduate school, it's been used as an example.
 [9] So it certainly was known to the late '40s, or by the
 [10] late '40s.

[11] BY MR. FLORIG:

[12] Q. Would you give the same answer for
 [13] dichlorobenzene as you gave for chlorobenzene?

[14] A. In a qualitative sense, yes.

- [15] Q. What do you mean by, "qualitative sense"?
[16] A. In general they should be similar, the amounts
[17] required to produce the effects may be somewhat
[18] different.
[19] Q. Would they be higher or lower for
[20] dichlorobenzene?
[21] A. I really can't say, I don't know.
[22] Q. Are you familiar with any toxic properties to

Page 211

- [1] humans associated with ethyl benzene?
[2] A. No, I have no specific knowledge on toxicity
[3] in humans.
[4] Q. Are you familiar with any toxic properties to
[5] humans associated with hexachlorobenzene?
[6] A. Yes.
[7] Q. What are those toxic effects?
[8] A. Hexachlorophene -
[9] Q. Hexachlorobenzene.
[10] A. I am sorry. I have no knowledge of
[11] hexachlorobenzene in humans.
[12] Q. Are you aware of any toxic effects in humans
[13] associated with hexane?
[14] A. No specific knowledge, just to general
[15] hydrocarbon solvent effects.
[16] Q. What are those general effects?
[17] A. Like most volatile solvents, high doses can
[18] produce some narcosis.
[19] Q. All right.
[20] A. They have a defatting action on skin. In
[21] prolonged or continuous contact it will cause skin
[22] irritation, will be irritating to the eye. High

Page 212

- [1] concentrations can lead to, inhaled, can lead to
[2] respiratory distress.
[3] Q. Is that true for most volatile hydrocarbons,
[4] those kinds of effects you just mentioned?
[5] A. To some degree this may be true for all of
[6] them. They may vary quantitatively in the amounts
[7] required, severity of effects that are produced.
[8] Q. Okay. Have they been known to have those
[9] properties since the 1940s and the 1950's?
[10] A. Again, I really am not able to say with any
[11] reliability when those, when that information was
[12] known.
[13] Q. Again, those are the kinds of chemicals that
[14] we would see referenced in the literature we have
[15] talked about over the last day and a half?
[16] A. Several, maybe all of them would appear in
[17] those references, yes.
[18] Q. Are you aware of any toxic effects on humans
[19] of lead?
[20] A. Yes.
[21] Q. What are those toxic effects?
[22] A. So-called plumbism, the most characteristic of

Page 213

- [1] which is the lead painter's colic, lead to some degree
[2] enterchanges with calcium, can be posited in the bone
[3] and can be detected by x-rays.
[4] In more recent years there has been increasing
[5] concern about the effects on lead, of lead on the
[6] development of youngsters, though again I might add
[7] that is subject to some controversy within the
[8] scientific community.
[9] Q. When were any of the toxic effects of lead
[10] that you just mentioned first known?
[11] A. Again, I cannot say, but it probably is one of
[12] the earliest recognized industrial poisons.
[13] Q. As an aside, several of the books I have seen
[14] referenced in the documents, or the early books refer
[15] to "industrial poisons." Was that common terminology
[16] back then, as opposed to talks instances or toxicity
[17] nowadays?
[18] A. I have seen some older texts that refer to
[19] industrial poisons, but I don't know how widespread or
[20] acceptable that terminology was.
[21] Q. All right. Are you aware of any toxic effects
[22] in humans associated with mercury?

Page 214

- [1] A. Yes.
[2] Q. What are those toxic effects?

- [3] A. In high doses mercury will produce visual
[4] disturbances in people, mental disturbances. It can
[5] produce a flushing of the skin. I guess those are the
[6] prominent features.
[7] Q. Were those toxic effects known back in the
[8] 1950's?
[9] A. The earliest that I can recall reading about
[10] those was in 1700.
[11] Q. 1700?
[12] A. Yes.
[13] Q. That was before the 1950's.
[14] Is mercury toxic to humans through the three
[15] main pathways into the body that we talked about
[16] yesterday?
[17] A. The primary hazard that I recall - the
[18] primary route with the hazardous exposure that I recall
[19] is inhalation of mercury vapor. Absorptions through
[20] the skin or through the gut, if one swallowed mercury,
[21] would probably be so minimal that little if any effects
[22] would be observed.

Page 215

- [1] Q. Do you recall an incident involving mercury
[2] contamination of seawater in Japan in the 1900s?
[3] A. I have read something about it.
[4] Q. Do you recall what that incident was about?
[5] A. There apparently was some waste mercury dumped
[6] into a bay, the metallic mercury, which apparently was
[7] thought to be inert, was modified by some aquatic
[8] organisms to produce so-called methyl mercury.
[9] And because of a change in characteristics
[10] that mercury was taken up by sea life and in turn
[11] ingested by people. And the people developed signs of
[12] mercurial poisoning.
[13] Q. That incident was widely discussed in the
[14] scientific literature back then, wasn't it?
[15] MR. WALSH: Object to the form, calls for
[16] speculation.
[17] A. As I have indicated, I have read about it.
[18] There were several papers published on it.
[19] BY MR. FLORIG:
[20] Q. In that case the exposure to humans was
[21] through ingestion, correct?
[22] A. Yes.

Page 216

- [1] Q. Are you aware of any toxic effects associated
[2] with muriatic acid?
[3] A. My recollection, well, my recollection is
[4] muriatic acid is hydrochloric acid, and that would be
[5] corrosive in high strength and an irritant at lower
[6] strengths.
[7] Q. All right. Corrosive to skin, among other
[8] things?
[9] A. Skin and eye corrosives and inanimate
[10] surfaces.
[11] Q. Do you recall if there were any toxic effects
[12] associated with inhalation of muriatic acid fumes?
[13] A. I do not recall specific data, but since it is
[14] an irritant, high concentrations of fumes would produce
[15] respiratory tract irritation.
[16] Q. Those effects would have been known back in
[17] the 1940s and '50s?
[18] A. Again, I don't know when they were developed.
[19] Currently it's certainly well established.
[20] Q. That is the kind of common industrial material
[21] you would expect to see referenced in the literature we
[22] have been talking about?

Page 217

- [1] A. That would be, in the earlier literature that
[2] would be the kind of information one would see, yes.
[3] Q. Are you aware of any toxic effects on humans
[4] associated with naphthalene?
[5] A. Again I have no specific knowledge of
[6] naphthalene.
[7] Q. How about naphtha?
[8] A. Other than generalized knowledge, I have no
[9] specific knowledge of the subject.
[10] Q. Very briefly, what is the generalized
[11] knowledge that you have?
[12] A. Naptha as I recall is a hydrocarbon fraction,
[13] it's a mixture of things. It's probably somewhat

- [14] similar to gasoline but a little more volatile.
 [15] Q. Is it a volatile hydrocarbon?
 [16] A. I have indicated it's a mixture of materials
 [17] which would be hydrocarbons.
 [18] Q. Are you aware of any toxic effects on humans
 [19] associated with nitrobenzene?
 [20] A. No specific knowledge on that subject.
 [21] Q. How about phenanthrene?
 [22] A. Same answer, no specific knowledge.

Page 218

- [1] Q. Are you aware of any toxic effects on humans
 [2] associated with phenol?
 [3] A. Yes.
 [4] Q. What are those effects?
 [5] A. Phenol has been used as a disinfectant in many
 [6] cases. It is, goes by the common name of carbolic
 [7] acid. It was one of the earliest regulated poisons
 [8] under the Federal Caustic Poisons Act as being
 [9] corrosive and, as I recall from my reading, can be
 [10] absorbed through skin and cause serious injuries in
 [11] people.
 [12] Q. Those effects were referenced in the 1940s or
 [13] '50s in the literature?
 [14] A. Again, I don't know whether they were
 [15] specifically first described, but they probably were at
 [16] that time.
 [17] Q. Next is a subject I know is near and dear to
 [18] your heart, polychlorinated biphenyls.
 [19] A. I have read quite a bit on polychlorinated
 [20] biphenyls.
 [21] Q. Are you aware of any toxic effects associated
 [22] with PCBs?

Page 219

- [1] A. Yes, like other chlorinated hydrocarbons in
 [2] adequately high doses they would produce liver damage
 [3] in animals.
 [4] Q. How about in humans?
 [5] A. There is some early literature in the '20s,
 [6] '30s, perhaps '40s, make it '30s and '40s probably,
 [7] that is confusing because there may or may not have
 [8] been polychlorinated biphenyls involved. But there
 [9] were also chlorinated naphthalenes involved. So the
 [10] literature is confusing with respect to whether or not
 [11] these produced liver injury in humans.
 [12] Q. Are you aware of any toxic effects on humans
 [13] of toluene?
 [14] A. The only effect that comes to mind is fairly
 [15] recent information that glue sniffers use toluene, and
 [16] that this can produce mental, nervous system damage.
 [17] Beyond that, only generalized knowledge of hydrocarbon
 [18] solvents.
 [19] Q. Is it a volatile?
 [20] A. It's fairly volatile, yes.
 [21] Q. Are you aware of any toxic effects on humans
 [22] of trichlorobenzene?

Page 220

- [1] A. I guess I would respond similar to what has
 [2] been said earlier on mono and dichlorobenzene. In some
 [3] respects it would be qualitatively similar to benzene,
 [4] but I don't have specific knowledge.
 [5] Q. You don't know whether the toxic level would
 [6] be higher or lower?
 [7] A. I do not.
 [8] Q. Are you aware of any toxic effects on humans
 [9] of trichloroethylene?
 [10] A. I have no direct specific knowledge on that
 [11] subject.
 [12] Q. Finally, xylene.
 [13] A. Xylene is somewhat similar to toluene. I am
 [14] not aware that it's been used by glue sniffers. Other
 [15] than generalized knowledge of organic hydrocarbon
 [16] solvents, I have no specific knowledge.
 [17] Q. Is that also a volatile?
 [18] A. Yes, it is.
 [19] Q. Throughout your career as a toxicologist and
 [20] working in conjunction with industrial hygienists and
 [21] medical personnel, is it fair to say that if a material
 [22] had known toxic effects on humans that you would not

Page 221

- [1] want humans to be potentially exposed to that material

- [2] in uncertain or uncontrolled concentrations?
 [3] A. I think I have indicated before, it is not the
 [4] intention to expose people. But one recognizes that
 [5] people will be exposed if the chemical is around.
 [6] Therefore, efforts are made to bring together what
 [7] information is available, including practices,
 [8] protective equipment and so forth, to minimize the
 [9] exposure of the individuals involved.

- [10] Q. Throughout your career that has simply been a
 [11] matter of good industrial safety practice, correct?

- [12] A. After I left the university, throughout my
 [13] industrial career I have been a member of the Medical
 [14] Department. And I have looked upon my efforts as
 [15] contributing part of the information that goes into
 [16] this generalized goal that I just enunciated.

- [17] MR. FLORIG: Let's take a two-minute break.
 [18] (Recess.)

- [19] MR. FLORIG: Back on.

- [20] BY MR. FLORIG:

- [21] Q. I really have just a couple, maybe one brief
 [22] question. That is, yesterday I asked you about

Page 222

- [1] translating the results of animal toxicity tests to
 [2] humans. Do you recall that?

- [3] A. Yes.

- [4] Q. And one of the things you do in making that
 [5] translation is to assume that the human is at least as
 [6] susceptible as the most susceptible animal?

- [7] A. With respect to mammalian toxicity and
 [8] estimation of effects on humans, you take the worst
 [9] case scenario. You say man could be at least as
 [10] sensitive as the most sensitive species that has been
 [11] studied.

- [12] MR. FLORIG: Dr. Levinskas, thank you. That
 [13] is all I have for right now.

- [14] BY MS. SANDBECK:

- [15] Q. Dr. Levinskas, my name is Marilyn Sandbeck and
 [16] I represent the Travelers Indemnity Company in this
 [17] action. I have just a few follow-up questions.
 [18] 18

- [19] Early on in your testimony yesterday you had
 [20] given us a definition you have of "toxic," and then
 [21] some time later you drew a distinction between toxicity
 [22] and irritant effects.

Page 223

- [1] A. Yes.

- [2] Q. A question was then asked whether an eye
 [3] irritant was a toxic effect in your view, and I don't
 [4] believe we ever got a clear answer to that.

- [5] A. I would regard eye irritation as certainly a
 [6] toxic effect. I was thinking more in terms of skin
 [7] irritation. Unless there is some manifestation of
 [8] systemic toxicity, I think of that as being a little
 [9] bit different.

- [10] For instance, reddening of the skin, or even a
 [11] mild swelling of the skin, I don't equate with the same
 [12] concern as a toxic effect in the sense of something
 [13] choking you or likely to face death. So I would make
 [14] that sort of distinction between them.

- [15] Q. It seems then that you have two working
 [16] definitions of toxic. The first one you said was any
 [17] adverse effect, and now if I understand you correctly,
 [18] you are equating it with risk of death?

- [19] A. No. I guess I would stand by my original
 [20] definition of toxic effect, but in terms of seriousness
 [21] or potential for, quote, marked harm, I think that
 [22] minor skin irritations would be certainly of very

Page 224

- [1] little concern to me.

- [2] Q. So the distinction is between levels of
 [3] concern?

- [4] A. I guess it's not my distinctions of level of
 [5] concern, I would point out there are some things which
 [6] I think are relatively trivial, and I would put minor
 [7] skin irritations, while I would concede they are toxic
 [8] effects, they would be of relatively little concern.

- [9] Q. But they all are within your definition of
 [10] "toxic"?

- [11] A. They would be within my definition of "toxic",
 [12] yes.

[13] Q. Mr. Forig also asked you about the three major
[14] pathways to the body, absorption, inhalation and
[15] ingestion.

[16] A. Yes.

[17] Q. And you included injection as another possible
[18] pathway?

[19] A. That's correct.

[20] Q. Then you also mentioned that eyes, for
[21] example, might be another pathway. And I am wondering
[22] if that would not just be a subset of absorption.

Page 225

[1] A. Insofar as the chemical gets into the body to
[2] produce an effect, that is the absorption process.

[3] Q. All right.

[4] A. There are, in my experience there have been
[5] two or three instances, there particularly comes out of
[6] working with military chemicals, where a chemical in
[7] the eye has killed, just a small amount of chemical,
[8] has killed a rabbit. And I don't think that people
[9] normally think of that. It's admittedly a very
[10] exceptional circumstance.

[11] And since the eye is bathed in a fluid as
[12] distinct from skin, I would make that as sort of a
[13] subdivision, if you will, of surface absorption.

[14] Q. All right.

[15] A. So there are some substeps under those three
[16] general categories.

[17] Q. Do you remember what that chemical was that
[18] killed the rabbit?

[19] A. I really don't recall the name of it at this
[20] time. It was many years ago.

[21] Q. I take it that is uncommon, the effect of the
[22] rabbit dying -

Page 226

[1] A. I have only seen it two or three times, and I
[2] have probably looked at or been told of thousands of
[3] eye tests.

[4] Q. Also in yesterday's testimony you discussed a
[5] study on acrylonitrile, and I believe the use for that
[6] acrylonitrile was going to be a bottle, some sort of -

[7] A. A beverage container.

[8] Q. Beverage container.

[9] A. Component of a beverage container, yes.

[10] Q. Is that the same as the Lopac?

[11] A. That was the trade name for the container, was
[12] Lopac, yes.

[13] Q. And I believe you said that that bottle was
[14] actually marketed by Monsanto?

[15] A. It's my recollection it was in a test market
[16] in two or three cities in the United States. It was
[17] done with the concurrence of the FDA. I do not recall
[18] the nature, whether it was a test permit or food
[19] additive regulation or whatever. Whatever the nature
[20] of the, quote, approval, end of quote, by the FDA, but
[21] it was done with their knowledge and concurrence.

[22] Q. And then was that bottle subsequently

Page 227

[1] withdrawn from the market?

[2] A. Yes, when the question arose about the
[3] carcinogenicity about acrylonitrile, it was withdrawn,
[4] I would almost say summarily, but I am not positive how
[5] that went by.

[6] Q. Do you know if it was as a result of federal
[7] regulatory action?

[8] A. I do not know what, that is, I don't know the
[9] specific steps involved, but it ceased to be a project
[10] and a product at that time.

[11] Q. Do you know if Coca Cola ever considered use
[12] of that particular bottle?

[13] A. Coca Cola was a user of this bottle, yes.

[14] Q. They did actually use it?

[15] A. Yes.

[16] Q. For how long of a time?

[17] A. I cannot recall.

[18] Q. Do you remember what time period it was that
[19] it was on the market, just approximately?

[20] A. Again, I would say around the middle '70s.

[21] Q. Yesterday you were asked some questions about
[22] your role in the analysis of waste streams, and I was

Page 228

[1] left somewhat confused by the testimony. So if we
[2] could go back to that, there are several aspects of it
[3] I think, and perhaps that is where my confusion lies.

[4] First of all, did you ever run any sort of
[5] tests, or direct someone else to, on the toxicity of
[6] any waste streams from any of Monsanto's processes?

[7] MR. WALSH: Objection as asked and answered.

[8] You can respond again.

[9] A. My recollection of my answer is that I
[10] indicated we may have done some short-term testing of
[11] waste streams or waste products, I cannot specifically
[12] recall having such tests done. But since we do very
[13] many short-term tests, it is conceivable that we did
[14] some of it, but I cannot say without check the records.
[15] I do not recall any.

[16] BY MS. SANDBECK:

[17] Q. All right. Now are you, this is where I am
[18] confused, are you assuming they were short-term just
[19] because you don't specifically remember doing them?

[20] A. Yes, that would be my basis. We do a lot of
[21] things, short-term testing. And unless there is a
[22] reason for them to stick in my memory, I just do not

Page 229

[1] recall many of them, most of them.

[2] Q. If there were a long-term test you would
[3] remember it?

[4] A. I would say that if there were long-term
[5] studies such as those we discussed on acrylonitrile,
[6] there is a much better chance I would remember them. I
[7] may have forgotten some long-term studies.

[8] Q. Apart from the obvious definitions of long and
[9] short, is there any distinction you can draw for me
[10] between a short-term study and a long-term study?

[11] A. Well, the purposes are a little bit different.
[12] As I have indicated, the longer term studies generally
[13] are in larger numbers of test organisms. The exposure
[14] conditions are usually less severe, and they are
[15] designed to determine if there would be some aspects
[16] of toxicity detected which had not been detected in the
[17] shorter term studies. So it's a series of progressive
[18] steps, if you will.

[19] Q. If you will look at Exhibit 1, which is your
[20] resume, on page 3.

[21] A. Okay.

[22] Q. Mr. Forig had asked you about the second

Page 230

[1] paragraph, first sentence, where it states that you
[2] "determined the need for, plans, monitors and evaluates
[3] all toxicity testing for the company." And then later
[4] on it also says, I think it's one sentence down,
[5] "Responsible for environmental assessment of all new
[6] products and new uses of existing products in the
[7] company."

[8] First of all, is that entire paragraph
[9] accurate?

[10] A. It was intended to be accurate, and I would so
[11] state that it is.

[12] Q. If this is accurate I would assume, then, that
[13] if any toxicity testing was done for Monsanto during
[14] the time that you were in that position, you would have
[15] at least been aware of it, is that correct?

[16] A. The way the phrase is made and the context in
[17] which I wrote that and which I would, from my
[18] understanding, my associates, they would read it, we
[19] are talking about mammalian toxicity.

[20] So that when I say that directed and
[21] supervised testing, that is what we were supposed to be
[22] doing for the company. And that is referring to

Page 231

[1] mammalian testing. I think I indicated elsewhere that
[2] I was not aware that there was testing outside our
[3] group.

[4] We come to the second portion of environmental
[5] assessment. And I indicated several times that new
[6] products or new uses of existing products were to be
[7] formalized and centralized in the Medical Department,
[8] we would look at and use whatever information there was
[9] in coming to a conclusion.

[10] Now there could be, if one wanted to use the
[11] term, toxicity testing of aquatic organisms or other

[12] environmental fate effects, that could be done
 [13] elsewhere in the company. I don't think it necessarily
 [14] is contradictory to what is stated here.
 [15] Q. In the context of this paragraph what is the
 [16] meaning of "environmental"?
 [17] A. Well, that ties in with the environmental
 [18] assessment, as I have indicated that we were to look at
 [19] new products and new uses of existing products and try
 [20] to anticipate the kinds of questions that might arise
 [21] if the product were commercialized and to review, make
 [22] recommendations and undertake testing to provide

Page 232

[1] information to respond to those questions that were
 [2] deemed, we might be responding to.
 [3] Q. Does the term "environment" here, or is this
 [4] term limited to the workplace environment?
 [5] MR. WALSH: I am sorry to interrupt. Which
 [6] environment are you referring to?
 [7] Thank you.
 [8] A. No, I think I have indicated repeatedly that
 [9] when we talk about environmental assessment of products
 [10] we talk about products, new products, existing, new
 [11] products and use of existing products and that we were
 [12] going to consider their manufacture, their use and
 [13] their ultimate fate or disposal in deciding what it is
 [14] that we should be doing.
 [15] BY MS. SANDBECK:
 [16] Q. In your position as director of environmental
 [17] assessment and toxicology were you ever consulted by
 [18] anyone at Monsanto about the toxicity of any of their
 [19] waste streams?
 [20] A. I guess my answer would be similar to what I
 [21] have said about toxicity testing. Over the years I
 [22] have been asked many questions. I do not have specific

Page 233

[1] recollection of a question or a response whether it was
 [2] made or whether it was not made. I just do not have a
 [3] recollection of such.
 [4] Q. Was there any standard procedure in place by
 [5] which the toxicity of a waste stream would come to your
 [6] attention?
 [7] A. Are you asking within Monsanto, or just what?
 [8] Q. Yes, within Monsanto was there a standard
 [9] procedure in place for your review of waste streams?
 [10] A. I can only respond by saying that this
 [11] environmental assessment procedure which dealt with new
 [12] products and uses of products were to be brought to the
 [13] attention of the medical director, and I as his
 [14] surrogate would look at them, many of them. What other
 [15] procedures may have been I do not have any knowledge
 [16] of.
 [17] Q. Well, within that context, the review that you
 [18] just mentioned, would that include waste streams?
 [19] A. If there was a, I think I indicated in
 [20] yesterday's testimony, if there was a new process which
 [21] could entail new waste streams, that would be subject
 [22] to a loss and personal property or property protection

Page 234

[1] review and ultimately be reviewed by other people.
 [2] I really am not aware of any, quote, SOPs. I
 [3] came to the company to start centralizing and working
 [4] on the environmental assessment procedure. This was
 [5] the funnel through which information was brought to my
 [6] attention. I have no basis for judging whether
 [7] everything was brought to my attention. And I have no
 [8] knowledge of alternate routes by which information
 [9] would flow.
 [10] But all I can say is if it was brought to my
 [11] attention, I would evaluate it and see its utility for
 [12] the purposes that I was suppose to deal with it.
 [13] Q. For value and utility are you talking about
 [14] the end product, itself?
 [15] A. The - our initial efforts, my initial efforts
 [16] were directed at new products and new uses of existing
 [17] products, and that is what I am referring to.
 [18] Q. Yesterday you mentioned that Monsanto had
 [19] always had an extensive and excellent, I am sorry, you
 [20] said that Monsanto always had extensive and excellent
 [21] analytical capabilities. You also mentioned using
 [22] their library to get information for your own studies.

Page 235

[1] A. Yes.
 [2] Q. Did you consider their information resources
 [3] also to be extensive and excellent?
 [4] A. I don't think I made an evaluation of them.
 [5] They had been in operation for many years, I guess,
 [6] they were certainly when I got there. When I visited
 [7] the facilities physically, there was literally endless
 [8] rows almost it seemed of journals and monographs of all
 [9] sorts of descriptions.
 [10] There were several people, of course, I got to
 [11] know the manager of the section quite well, but there
 [12] were several people whose primary job was to do
 [13] literature searches, and I just decided to avail myself
 [14] of it. I don't think I gave it a conscious thought or
 [15] any doubt, any reason to doubt it.
 [16] Q. Were you pleased with the results that you got
 [17] from the person that you went to to get information?
 [18] A. More than pleased.
 [19] Q. The information you got was sufficient in
 [20] quantity and timeliness?
 [21] A. Yes.
 [22] Q. You mentioned that part of your

Page 236

[1] responsibilities at Monsanto, I am not sure in what
 [2] position you were in this regard, but you mentioned
 [3] that part of your responsibilities included helping
 [4] regulatory agencies to set standards?
 [5] A. That has been done on occasion, yes.
 [6] Q. Specifically, which standards were you
 [7] involved with as far as helping to set regulatory
 [8] standards?
 [9] A. The one that was most significant probably was
 [10] when the Environmental Protection Agency was looking at
 [11] setting testing standards for chemicals. There were
 [12] several symposia or meetings held in Washington under
 [13] the auspices of the Conservation Foundation. There
 [14] were representatives from industry, academia, public
 [15] interest groups.
 [16] We met in a series of workshops to see to what
 [17] extent we could agree and what recommendations we could
 [18] make to the administrator of the EPA for testing of new
 [19] chemicals, what sort of testing procedures and the
 [20] rationale for them, with the desired goal of limiting
 [21] the amount of debate which might take place between
 [22] these groups on proposed regulations and going to the

Page 237

[1] administrator with a set of regulations that were
 [2] agreed upon and that could be implemented rather
 [3] quickly.
 [4] So that was the one that I would say is most
 [5] memorable, in that area.
 [6] Q. Did that pertain to a particular class of
 [7] chemicals?
 [8] A. This was just new chemicals in the broadest
 [9] sense, without specific details as to which chemical.
 [10] Q. Were you there as a representative of
 [11] Monsanto, alone, as opposed to the industry?
 [12] A. I am not sure. I was elected, or I was
 [13] designated as a Monsanto representative. Whether an
 [14] industry group or somebody else made that suggestion to
 [15] somebody else, I don't know.
 [16] But the impression I had was that I was
 [17] representing industry in general, not Monsanto
 [18] specifically, but I was an industry representative who
 [19] happened to be an employee of Monsanto.
 [20] Q. Do you remember any other standards that you
 [21] offered assistance in providing new limits?
 [22] A. Most, as you well know, most of the proposed

Page 238

[1] regulations are published in the Federal Register and
 [2] comment is solicited from various sources. I have on
 [3] several occasions, or on some occasions I should say,
 [4] not several, been asked to provide input and I have
 [5] made comments.
 [6] One specific one that comes to mind was they
 [7] had an arsenic expander in their document, they cited,
 [8] it was an arsenic compound, not just simple arsenic, it
 [9] was a rather complicated arsenic compound.
 [10] And in their published proposed regulation

[11] they made reference to the, quote, extreme toxicity,
 [12] "extreme" is my word, which did not look right to me.
 [13] So I checked the reference that they had and found that
 [14] they had transposed gram, the abbreviation gm., and
 [15] printed it as mg., milligram, which indicated that the
 [16] toxicity was a thousand times greater than reported in
 [17] the literature.

[18] I just cite that for two reasons. One is that
 [19] that is the sort of example of some of the things that
 [20] I have done. And also there is a difficulty when
 [21] people collect and cull information. Unless they are
 [22] careful, there can be errors in the transcription.

Page 239

[1] But most of the others, not most, all of the
 [2] others were in response to regulations where if I was
 [3] asked I would have made comments or offered my area,
 [4] comments in my area of expertise and they would have
 [5] been incorporated into a more generalized Monsanto
 [6] response.

[7] Q. Who would have asked you to make that
 [8] response?

[9] A. It would have been just about anybody. Could
 [10] have been fellow members of the Medical Department, it
 [11] could have been people who had a product or an interest
 [12] in the product. It could have come from any one of
 [13] several sources.

[14] Q. Do you remember any of the specific chemicals
 [15] that these recommendations might have dealt with in
 [16] addition to the arsenic and -

[17] A. I really do not. They did not involve that
 [18] much effort on my part, so they don't really stick in
 [19] my memory.

[20] Q. You mentioned that some of the people who
 [21] might have asked you to respond were those who had an
 [22] interest in the product?

Page 240

[1] A. Yes.

[2] Q. Do you mean people within a particular
 [3] Monsanto operating company?

[4] A. Monsanto as far as I know does not make
 [5] benzene. But using that as an example, I would expect
 [6] that if a man was making benzene and OSHA or some
 [7] agency was going to publish a regulation regarding
 [8] benzene, he would learn about it and he would come in
 [9] and say is there something we should do or could do or
 [10] ought to do.

[11] And that is what I mean by the operating
 [12] people, the people who make or sell or use the product
 [13] in their operations.

[14] Q. What is environmental fate testing?

[15] A. Again, I am not sure that is a standardized
 [16] term. But in my concept it would be, it's a
 [17] determination or it's an estimation of what is the
 [18] actual fate, what's the actual known last event that
 [19] happens to that material.

[20] Q. You said that type of test would be done by
 [21] another department, the environmental -

[22] A. I believe I said there was an environmental

Page 241

[1] sciences laboratory or group and that they could be
 [2] doing such testing. I was not doing such testing.

[3] Q. Do you know if the environmental science group
 [4] included any toxicologists?

[5] A. Rich Kimmerle we referred to yesterday is
 [6] considered by some people to be an aquatic
 [7] toxicologist.

[8] I do not really know the specific background
 [9] of those people well enough to comment beyond saying
 [10] that I am not aware that they have any, quote,
 [11] mammalian toxicologists in that group.

[12] Q. Mr. Forig asked you about toxic effects of a
 [13] variety of substances, one of which was mercury.

[14] A. Yes.

[15] Q. And you stated that the main hazard resulted
 [16] from inhalation of mercury fumes?

[17] A. Vapor.

[18] Q. Mercury vapor?

[19] A. I guess fumes is a possibility, though it
 [20] seems unlikely route of exposure but the vapor
 [21] certainly is a hazard.

[22] Q. Mr. Forig also asked you about the incident in

Page 242

[1] Japan that resulted in mercury poisoning?

[2] A. That's correct.

[3] Q. And these people that were affected by the
 [4] mercury had ingested the substance.

[5] There seems to be a conflict there between
 [6] your description of the toxic effects of mercury and
 [7] what happened in Japan, and I am wondering if you can
 [8] just explain that for me.

[9] A. There are two, two differences. The earlier
 [10] discussion, my comments about mercury were talking
 [11] about metal-like mercury. And I indicated that
 [12] swallowing it or on the skin of the metal-like mercury
 [13] I did not think represented any appreciable hazard.
 [14] The incident in Japan, the metal-like mercury,
 [15] it is now known, was converted to methyl mercury, which
 [16] is a different form of mercury. In that form it was
 [17] taken up by aquatic organisms and transmitted to
 [18] people.

[19] So we are talking about a different form of
 [20] mercury, and we are talking about a different duration
 [21] of exposure. When we talked the first time it was a
 [22] single dose of metal-like mercury by mouth, and now we

Page 243

[1] are talking about repeated doses of modified mercury by
 [2] mouth, and that is why the differences in responses.

[3] Q. Are there other types of mercury in addition
 [4] to metal-like and methyl?

[5] A. Mercury forms a variety of chemicals. And so,
 [6] yes, there would be other materials in which mercury
 [7] could appear.

[8] Q. What causes the transformation from metal-like
 [9] to methyl mercury?

[10] A. Beyond the general comment I made that it is
 [11] metabolized or modified by organisms in the water, I do
 [12] not know the details.

[13] Q. So your comment regarding absorption or
 [14] ingestion of mercury having a very limited
 [15] toxicological effect was addressed just to a one-time
 [16] contact with metal-like mercury?

[17] A. That's correct.

[18] MS. SANDBECK: Nothing further.

[19] EXAMINATION BY COUNSEL FOR PLAINTIFF

[20] BY MR. WALSH:

[21] Q. Dr. Levinskas, I just have one brief area. I
 [22] will try to be very brief on it.

Page 244

[1] Mr. Forig and Ms. Sandbeck had asked you about
 [2] the toxicity of a number of chemicals, and I just want
 [3] to explore that area just a bit.

[4] Does the fact that a chemical is toxic to
 [5] humans necessarily mean that it poses a hazard to human
 [6] beings?

[7] A. To me toxicity is almost a characteristic or
 [8] what one might also say a property of a chemical,
 [9] namely, that if there is enough of the chemical at the
 [10] right place at the right time, it will produce some
 [11] degree of injury which could include death.

[12] Q. Let me ask you to take a look at what has been
 [13] marked as Levinskas Exhibit 2. In particular I want to
 [14] direct your attention to page 3, the second paragraph.
 [15] If you could just read that, please.

[16] MS. SANDBECK: Which page?

[17] MR. WALSH: Page 3, second paragraph.
 [18] (Witness examines document.)

[19] BY MR. WALSH:

[20] Q. Now would you agree with the statement that
 [21] you have made there in this paper?

[22] A. Yes.

Page 245

[1] Q. Is that basically the same point that you just
 [2] made?

[3] A. Yes. I was about to add that the hazard, the
 [4] risk of seeing signs of toxicity, from handling a
 [5] chemical, will depend on the conditions under which
 [6] it's used, the degree of exposure, a variety of other
 [7] factors.

[8] Q. By analogy here, would this cup of coffee,
 [9] could it be considered toxic based upon what you have,

[10] your definition as you use it in this paragraph?

[11] A. Yes, there are some people to whom a cup of
[12] coffee would produce jitters and anxiety, and you can
[13] regard that as a toxic effect.

[14] Q. Would this distinction that you have drawn
[15] between toxicity and the hazards of a chemical hold
[16] true for all of the chemicals that you discussed with
[17] Mr. Forig?

[18] And I am referring only to those ones that you
[19] had specific knowledge of their toxicity.

[20] A. I would say this is characteristic of all
[21] chemicals.

[22] Q. So the fact that they are toxic doesn't

Page 246

[1] necessarily mean they are hazardous?

[2] MR. FLORIG: Objection, leading.

[3] MR. WALSH: Let me rephrase the question.

[4] BY MR. WALSH:

[5] Q. Does the fact that a chemical has toxic
[6] propensities necessarily mean that it is hazardous to
[7] human health?

[8] MR. FLORIG: Objection, leading.

[9] A. If I could answer the question by
[10] paraphrasing, I would say despite the toxicity of a
[11] chemical it can be handled safely or in a non-hazardous
[12] manner.

[13] BY MR. WALSH:

[14] Q. Now if you disposed of a toxic chemical in a
[15] manner which you reasonably believed would not likely
[16] result in human contact, then by your definition of
[17] hazardous -

[18] MR. WALSH: Let me strike that.

[19] BY MR. WALSH:

[20] Q. If you disposed of a toxic chemical in a
[21] manner which you reasonably believed would not likely
[22] result in human contact, then by your definition a

Page 247

[1] particular chemical may pose little or no hazard to
[2] human health?

[3] MS. SANDBECK: Objection, leading.

[4] THE WITNESS: Am I allowed to answer, or not?

[5] BY MR. WALSH:

[6] Q. Yes, you can answer.

[7] A. Since hazard involves exposure conditions to
[8] determine the degree of hazard, the conditions of
[9] exposure, it would be disposed of in a manner that
[10] there was no or negligible exposure, then the hazard
[11] should be none or negligible.

[12] Q. Would that be true for all of the chemicals
[13] which Mr. Forig and Ms. Sandbeck discussed with you
[14] both yesterday and today?

[15] A. In my judgment that would be true.

[16] Q. Are you aware of any chemicals that in and of
[17] themselves are hazardous by your definition?

[18] A. Hazard has to be associated with the use and
[19] the potential for exposure. To speak of hazards
[20] without recognizing the conditions of exposure I think
[21] is a meaningless exercise.

[22] MR. WALSH: Thank you. I don't have any

Page 248

[1] further questions.

[2] MS. SANDBECK: Could we have just a few
[3] minutes.

[4] MR. FLORIG: Sure, because I am going to have
[5] some questions.

[6] (Recess.)

[7] FURTHER EXAMINATION BY COUNSEL FOR
DEFENDANTS

[8] MR. FLORIG: Back on the record.

[9] BY MR. FLORIG:

[10] Q. Dr. Levinskas, as you understand, you are
[11] still under oath, correct?

[12] A. I do.

[13] Q. Any chemical in the right place in sufficient
[14] quantity can be hazardous, correct?

[15] A. Any chemical in the right place at the right
[16] amount for the required period of time, I would add
[17] that, yes.

[18] Q. Hazard depends on a variety of factors,
[19] correct?

[20] A. Hazard is associated with use, insofar as use
[21] is varied, there could be a variety of factors
[22] involved.

Page 249

[1] Q. What would those factors be?

[2] A. It would depend on the nature of the material.
[3] It would depend on how it's going to be used, for what
[4] it's going to be used, who is going to use it, what
[5] precautions if any the user may impose on himself or
[6] others may impose on him.

[7] Those are the ones that come most readily to
[8] mind, and if I reflected on this I might have some
[9] additional ones.

[10] Q. Would you agree that hazard associated with a
[11] toxic chemical increases along with the concentration
[12] of that toxic chemical?

[13] A. I think that in the conditions that we talked
[14] about, we talked about the degree of exposure and also
[15] the duration or I will add intensity, which is
[16] synonymous with duration of exposure. Insofar as
[17] concentration affects those, it would be a factor.

[18] Q. And the duration of exposure is another
[19] factor?

[20] A. Well, duration of exposure, intensity of
[21] exposure sort of interrelate.

[22] Q. The quantity of the toxic chemical would also

Page 250

[1] increase the hazard?

[2] A. It would depend - the quantity would depend
[3] on the period of time over which it was taken.

[4] Q. Would the nature of the medium in which the
[5] toxic chemical exists or is stored potentially increase
[6] the hazard?

[7] A. It's difficult to say. Insofar as the way it
[8] is stored or the medium in which it is stored would
[9] contribute to exposure or absorption or would inhibit
[10] exposure or absorption, to that extent it would be a
[11] factor.

[12] Q. The hazard associated with the use of a toxic
[13] chemical or toxic chemicals then goes up depending on
[14] those factors that you just mentioned, concentration,
[15] duration, quantity, medium, all of those factors go
[16] into assessing the hazard, correct?

[17] MR. WALSH: Objection to your preliminary
[18] statement. It was not accurate with the testimony.

[19] BY MR. FLORIG:

[20] Q. If there is anything inaccurate in what I just
[21] asked you, let me know.

[22] A. I would say those are all factors one would

Page 251

[1] consider in estimating the hazard. They do not
[2] necessarily all contribute to an increased, or I
[3] shouldn't say that. They may or may not contribute to
[4] an increased hazard, there may be some times when they
[5] might contribute to an increased hazard.

[6] Q. If the medium in which a toxic chemical were
[7] stored increased the chance that that material would
[8] come in contact with people, that would be an increase
[9] in the hazard, correct?

[10] MR. WALSH: Objection to form. Lack of
[11] foundation.

[12] THE WITNESS: May I have the question reread?
[13] (The reporter read as directed.)

[14] A. If the medium facilitated contact between the
[15] person and the chemical, that would be a factor to
[16] consider because it has the potential to contribute to
[17] hazard.

[18] BY MR. FLORIG:

[19] Q. All right.

[20] A. But if the medium that brought it to the
[21] individual did not affect or inhibit absorption, it
[22] would not be a detrimental component in that sense, it

Page 252

[1] would not contribute to the hazard.

[2] Q. When you used the word "absorption", what did
[3] you mean in your last statement?

[4] A. It has to go from the medium into the organism
[5] or into the person. If it's held by the medium,
[6] doesn't leave the medium and go into the person, then I
[7] don't think it contributes to the hazard.

[8] Q. Just so I understand this point sufficiently,
 [9] if the medium allows the hazardous chemical –
 [10] MR. FLORIG: Strike that.
 [11] BY MR. FLORIG:
 [12] Q. If the medium does not contain the hazardous
 [13] or toxic substance, but instead allows it to
 [14] potentially reach humans, that choice of medium has
 [15] increased the hazard, correct?
 [16] MR. WALSH: Objection, the question is
 [17] ambiguous insofar as the term "contained" is used.
 [18] BY MR. FLORIG:
 [19] Q. Do you have any trouble with the word
 [20] "contained", Dr. Levinskas?
 [21] A. I have trouble more with the word "hazard".
 [22] MR. FLORIG: Can I hear the question back.

Page 253

[1] (The reporter read as directed.)
 [2] MR. WALSH: Do you understand my question?
 [3] MR. FLORIG: I think I do. I will rephrase
 [4] it.
 [5] MR. WALSH: Because I will explain it to you
 [6] if that would help.
 [7] BY MR. FLORIG:
 [8] Q. If the medium in which the toxic chemical is
 [9] contained does not confine the toxic chemical to that
 [10] area, but instead allows it to leave the area and
 [11] potentially reach human beings, that choice of medium
 [12] has increased the hazard, is that true?
 [13] MR. WALSH: Objection, hypothetical, abstract.
 [14] A. I would go back to my definition of "hazard".
 [15] The hazard of the chemical, the manifestations of
 [16] toxicity involve a given use or conditions of use or
 [17] exposure where that chemical can enter into the
 [18] organism.
 [19] The fact that the chemical is adjacent but not
 [20] in the organism to me is a fact – or the fact that a
 [21] chemical is present in a medium is a factor to consider
 [22] in estimating hazard.

Page 254

[1] BY MR. FLORIG:
 [2] Q. All right.
 [3] A. If the chemical stays in the medium and does
 [4] not get into the organism, then I by the definition I
 [5] have given, it does not represent a hazard to the
 [6] organism.
 [7] Q. Let's assume that the toxic chemical can get
 [8] from the medium into a human. Has the choice of medium
 [9] that would not confine the material within it increased
 [10] the hazard?
 [11] MR. WALSH: Objection, vague, confusing.
 [12] A. I guess I would have to go back to reiterate
 [13] what I have said about hazard. There is a use and
 [14] conditions for exposure from which one estimates the
 [15] hazard, the hazard will be related to the amount of
 [16] material, the duration and so forth in the organism.
 [17] Now, as long as it is outside the organism I
 [18] don't think that represents a hazard to the organism.
 [19] Whether it's next door or, you know, just outside the
 [20] skin, if it does not get into the body, it should not
 [21] manifest the signs of toxicity.
 [22] Q. I have asked you to assume that the toxic

Page 255

[1] material can enter the body. Do you then increase the
 [2] hazard to the body by increasing the chance that the
 [3] material can get to the body?
 [4] MR. WALSH: Same objection.
 [5] A. The hazard is an estimate of the risk of
 [6] seeing signs of toxicity. Now without regard to how it
 [7] comes, the hazard has to have some estimates, some
 [8] basis for judging the amount that gets in the organism,
 [9] the duration of the exposure, the intensity, all of
 [10] these have to go into the estimation of hazard. How it
 [11] is brought to the organism I don't think relates
 [12] particularly to the hazard as I am trying to use the
 [13] term.
 [14] Q. Let me approach it this way. If a material is
 [15] known to be toxic to humans, do I increase the hazard
 [16] to you the more I increase the chance of that material
 [17] reaching you?
 [18] A. Insofar as there is a greater potential or

[19] greater actuality that the person will absorb more of
 [20] the chemical, that would represent a more hazardous use
 [21] than one with a lesser potential for absorption. But
 [22] that is an element in assessing, estimating degree of

Page 256

[1] hazard. It's not how it got there, it's how much is
 [2] there and the other factors that we have been talking
 [3] about.
 [4] Q. And also includes precautions taken to keep it
 [5] from getting there?
 [6] A. I think precautions to, if one makes an
 [7] estimate of hazard or one wants to reduce the hazard,
 [8] one way of approaching that is to take additional
 [9] precautions as I have indicated, such as protective
 [10] equipment, other devices, to minimize or to reduce the
 [11] potential for exposure.
 [12] Q. And that is a common sense reasonable step in
 [13] industrial safety practice, isn't that true?
 [14] A. I can speak for what I would consider a
 [15] practice. I cannot speak for the generalities of
 [16] everybody.
 [17] Q. What is your opinion?
 [18] A. I think one should take steps to minimize
 [19] exposure insofar that it is feasible.
 [20] Q. And to minimize potential exposure?
 [21] A. Well, when I say exposure I am thinking of
 [22] potential exposure as well, real or imagined exposures.

Page 257

[1] MR. FLORIG: That is all I have for now.
 [2] MS. SANDBECK: I have nothing further.
 [3] MR. WALSH: I don't have anything further, so
 [4] that will conclude the deposition.
 [5] Just for the record I would request on behalf
 [6] of Monsanto that the transcript be designated as
 [7] confidential.
 [8] And you can forward the transcript to me for
 [9] forwarding to Dr. Levinskas's review and signing.
 [10] Thank you, Dr. Levinskas.
 [11] MR. FLORIG: Thank you, Doctor.
 [12] (Whereupon, the deposition was concluded at
 [13] 1:05 p.m.)
 [14]
 [15]
 [16]
 [17]
 [18]
 [19]
 [20]
 [21]
 [22]

Page 258

[1] ACKNOWLEDGMENT OF DEPONENT
 [2] I, George J. Levinskas, hereby acknowledge that I
 [3] have read and examined the foregoing pages of my
 [4] deposition and that:
 [5] (Check appropriate box.)
 [6] () the same is a true, correct and complete
 [7] transcription of the answers given by me to
 [8] the questions therein recorded.
 [9] () except for the changes noted in the attached
 [10] Errata Sheet, the same is a true, correct and
 [11] complete transcription of the answers given
 [12] by me to the questions therein recorded.
 [13]
 [14] Date Signature of Witness
 [15] Subscribed to and sworn before me.
 [16] this day of , 19
 [17]
 [18] Notary public in and for the
 [19] My commission expires:
 [20]
 [21]
 [22]

Page 259

[1] Certificate of Reporter)
 [2] United States of America) ss.
 [3] District of Columbia)
 [4] I, CRAIG L. KNOWLES, the officer before whom
 [5] the foregoing deposition was taken, do hereby certify
 [6] that the witness whose testimony appears in the

[7] foregoing deposition was duly sworn by me; that the
[8] testimony of said witness was taken by me to the best
[9] of my ability and thereafter reduced to print under my
[10] direction; that I am neither counsel for, related to,
[11] nor employed by any of the parties to the action in
[12] which this deposition was taken and, further, that I am
[13] neither a relative nor an employee of any attorney or
[14] counsel employed by the parties thereto nor financially
[15] or otherwise interested in the outcome of this action.

[16] Witness my hand this 26th day of December, 1992.

[17]

[18] Notary Public in and for

[19] the District of Columbia.

[20] My Commission Expires October 31, 1994:

[21]

[22]

Look-See Concordance Report

1,701 UNIQUE WORDS
386 NOISE WORDS
14,996 TOTAL WORDS

SINGLE FILE
CONCORDANCE

CASE SENSITIVE

WORD RANGES @
BOTTOM OF PAGE

- 1 -

1 [5] 164:9; 165:17, 18, 22; 229:19
12 [1] 182:13
1201 [1] 162:19
164 [1] 164:9
1700 [2] 214:10, 11
1776 [1] 163:16
179 [1] 164:10
18 [1] 222:18
18999 [1] 163:5
19 [1] 258:16
1900s [1] 215:2
19103 [1] 163:11
1940s [7] 194:14; 203:6;
207:4; 209:2; 212:9;
216:17; 218:12
1950 [10] 196:9, 19;
202:2, 10; 204:15; 207:5,
16; 212:9; 214:8, 13
1950s [3] 195:22; 196:1,
11
1971 [1] 170:5
1973 [1] 181:13
1977 [6] 166:16, 17;
167:12, 13; 170:12
1980 [1] 167:3
1980s [1] 167:6
1981 [1] 167:16
1986 [1] 167:3
1992 [2] 162:14; 259:16
1994 [1] 259:20
1:05 [1] 257:13

- 2 -

2 [5] 164:10; 180:17, 18,
22; 244:13
20006 [1] 163:17
2005 [1] 163:10
20s [1] 219:5
21st [1] 162:19
221 [1] 164:5
23 [1] 162:14
242 [1] 164:6
247 [1] 164:4
26th [1] 259:16

- 3 -

3 [4] 170:4; 229:20;
244:14, 17
3-19-71 [1] 168:19
30s [3] 194:15; 219:6
31 [1] 259:20
350 [1] 163:4
37th [1] 163:9

- 4 -

40s [4] 210:9, 10; 219:6

- 5 -

5 [1] 164:4
50 [2] 203:6; 209:3
50s [2] 216:17; 218:13

58 [1] 197:11

- 6 -

6 [1] 169:3

- 7 -

70s [1] 227:20

75 [2] 169:3, 8

77 [5] 169:5, 6, 7, 10, 11

- 8 -

80 [1] 167:7

88C-A-118-1-CV [1]

162:7

- 9 -

9:30 [1] 162:19

- A -

a.m. [1] 162:19

abbreviation [1] 238:14

ability [1] 259:9

able [2] 200:7; 212:10

absorb [1] 255:19

absorbed [1] 218:10

absorption [10] 224:14,

22; 225:2, 13; 243:13;

250:9, 10; 251:21; 252:2;

255:21

Absorptions [1] 214:19

abstract [2] 192:5; 253:13

academia [1] 236:14

accept [1] 175:21

acceptability [1] 195:18

acceptable [1] 213:20

accurate [5] 168:3; 230:9,

10, 12; 250:18

acid [6] 209:19; 216:2, 4,

12; 218:7

acknowledge [1] 258:2

ACKNOWLEDGMENT

[1] 258:1

Acrylonitrile [1] 189:15

acrylonitrile [10] 187:20,

21; 188:1, 7, 17; 189:5;

226:5, 6; 227:3; 229:5

Act [1] 218:8

action [8] 182:17; 192:18,

19; 211:20; 222:17; 227:7;

259:11, 15

actions [2] 190:3; 195:19

actual [3] 167:9; 240:18

actuality [1] 255:19

Acute [1] 174:2

acute [8] 179:10; 188:18;

189:1, 7, 8, 16, 17; 200:1

acutely [1] 189:10

add [4] 213:6; 245:3;

248:16; 249:15

addition [4] 188:17;

200:8; 239:16; 243:3

additional [2] 249:9;

256:8

additive [19] 180:11;

182:18; 183:6, 7, 15, 17,

18, 22; 184:4, 7, 8, 10,

12, 13, 14; 190:21; 191:3;

226:19

addressed [1] 243:15

adequately [1] 219:2

adjacent [1] 253:19

administrator [2] 236:18;

237:1

admittedly [1] 225:9

admonition [1] 186:3

adopted [1] 176:18

adverse [2] 202:6; 223:17

AETNA [1] 162:8

affect [1] 251:21

affected [1] 242:3

affects [1] 249:17

agencies [2] 192:11;

236:4

Agency [1] 236:10

agency [1] 240:7

agree [3] 236:17; 244:20;

249:10

agreed [1] 237:2

agreement [1] 162:17

al [1] 162:9

allowed [1] 247:4

allows [3] 252:9, 13;

253:10

alone [2] 201:21; 237:11

alternate [2] 189:22;

234:8

alternates [1] 189:22

aluminum [3] 208:2, 5,

6

ambiguous [1] 252:17

America [1] 259:2

American [2] 176:5;

209:10

amount [6] 182:10;

225:7; 236:21; 248:16;

254:15; 255:8

amounts [2] 210:16;

212:6

analogy [1] 245:8

analysis [2] 177:13;

227:22

Analytical [1] 173:14

analytical [3] 173:20;

177:22; 234:21

Anderson [1] 163:3

anecdotes [1] 194:10

anesthetic [3] 202:4, 7;

206:21

animal [2] 222:1, 6

Animals [1] 174:3

animals [5] 189:12;

190:8; 204:6, 10; 219:3

answer [17] 172:18;

187:12, 13; 189:19; 190:4;

191:22; 195:20; 205:15;

207:20; 210:12; 217:22;

223:4; 228:9; 232:20;

246:9; 247:4, 6

answered [1] 228:7

answers [2] 258:7, 11

anticipate [1] 231:20

anxiety [1] 245:12

anybody [3] 192:10;

196:4; 239:9

Apart [1] 229:8

apparently [2] 215:5, 6

appear [2] 212:16; 243:7

APPEARANCES [1]

163:1

appears [2] 208:7; 259:6

applied [1] 180:9

applies [2] 180:7; 184:20

apply [1] 186:22

appreciable [1] 242:13

approach [1] 255:14

approaching [1] 256:8

appropriate [1] 258:5

approval [1] 226:20

approximately [3] 167:3;

193:1; 227:19

approximation [1]

193:12

aquatic [5] 170:22; 215:7;

231:11; 241:6; 242:17

area [7] 237:5; 239:3, 4;

243:21; 244:3; 253:10

areas [1] 188:16

arise [1] 231:20

arm [1] 176:5

Aromatic [1] 178:11

arose [1] 227:2

arsenic [5] 238:7, 8, 9;

239:16

article [1] 202:22

articles [2] 177:21; 209:7

aside [3] 184:18; 188:6;

213:13

asking [2] 189:6; 233:7

aspects [3] 181:16; 228:2;

229:15

assessing [2] 250:16;

255:22

assessment [9] 166:20;

167:8; 230:5; 231:5, 18;

232:9, 17; 233:11; 234:4

assistance [1] 237:21

associated [20] 204:11,

21; 208:5, 12, 18; 209:13;

211:1, 5, 13; 213:22;

216:1, 12; 217:4, 19;

218:2, 21; 247:18; 248:20;

249:10; 250:12

associates [1] 230:18

assume [5] 172:13;

222:5; 230:12; 254:7, 22

assuming [1] 228:18

assurance [1] 185:9

assure [1] 172:21

astringent [1] 208:7

attached [3] 169:22;

170:2; 258:9

attempts [1] 200:9

attended [1] 181:18

attention [8] 170:4;

182:13; 233:6, 13; 234:6,

7, 11; 244:14

attests [1] 176:19

attorney [1] 259:13

auspices [1] 236:13

Austin [1] 162:18

authoritative [1] 174:15

authors [2] 175:19; 179:3

avail [1] 235:13

available [1] 221:7

avoid [2] 183:20; 184:6

aware [22] 176:8; 193:6;

208:17; 209:6, 12; 211:12;

212:18; 213:21; 216:1;

217:3, 18; 218:1, 21;

219:12, 21; 220:8, 14;

230:15; 231:2; 234:2;

241:10; 247:16

awareness [1] 193:8

- B -

background [1] 241:8

based [2] 204:8; 245:9

basically [2] 200:22;

245:1

basis [5] 206:14; 208:22;

228:20; 234:6; 255:8

bathed [1] 225:11

bay [1] 215:6

behalf [5] 162:21; 163:6,

12, 18; 257:5

beings [2] 244:6; 253:11

believe [11] 167:2, 16;

168:9; 176:4; 184:2, 4;

206:18; 223:4; 226:5, 13;

240:22

believed [2] 246:15, 21

beneficial [1] 190:18

Benzene [1] 204:17

benzene [14] 203:2, 9,

14, 21; 204:6, 7, 10, 15;

208:20; 211:1; 220:3;

240:5, 6, 8

Beverage [1] 226:8

beverage [3] 182:6;

226:7, 9

Biochemistry [1] 178:10

biphenyls [3] 218:18, 20;

219:8

bit [4] 218:19; 223:9;

229:11; 244:3

bleeding [1] 208:9

body [8] 194:17; 214:15;

224:14; 225:1; 254:20;

255:1, 2, 3

bone [2] 204:1; 213:2

book [27] 173:13, 16, 18,

21; 174:1, 7, 12, 13, 22;

175:2, 5; 177:9, 10, 16;

178

- Certificate [1] 259:1
 certify [1] 259:5
 chance [4] 229:6; 251:7;
 255:2, 16
 change [2] 167:10; 215:9
 changed [2] 195:17, 19
 changes [1] 258:9
 characteristic [4] 209:18;
 212:22; 244:7; 245:20
 characteristics [1] 215:9
 Check [1] 258:5
 check [1] 228:14
 checked [1] 238:13
 chemical [48] 177:13;
 185:3, 8, 9, 10, 13, 20;
 191:20; 200:21; 201:8;
 202:18; 208:3; 221:5;
 225:1, 6, 7, 17; 237:9;
 244:4, 8, 9; 245:5, 15;
 246:5, 11, 14, 20; 247:1;
 248:13, 15; 249:11, 12,
 22; 250:5, 13; 251:6, 15;
 252:9; 253:8, 9, 15, 17,
 19, 21; 254:3, 7; 255:20
 Chemicals [1] 179:5
 chemicals [38] 174:10;
 175:9, 14; 176:14; 179:12;
 184:20; 185:5, 15, 16;
 186:10; 187:3; 190:13, 15;
 191:1, 4, 15; 198:4, 7;
 199:16; 200:4, 16, 17;
 201:18; 205:3; 212:13;
 225:6; 236:11, 19; 237:7,
 8; 239:14; 243:5; 244:2;
 245:16, 21; 247:12,
 16; 250:13
 Chemistry [2] 173:14;
 177:7
 chemistry [2] 173:21;
 177:22
 chlorenes [1] 201:3
 chloride [11] 187:15, 16;
 189:13; 201:22; 202:1, 4,
 13, 15; 208:2, 5, 6
 chlorinated [13] 200:18,
 20; 201:3, 5, 12, 14;
 205:9, 11, 20; 206:15;
 207:2; 219:1, 9
 chlorobenzene [4]
 208:18, 19; 209:1; 210:13
 choice [3] 252:14; 253:11;
 254:8
 choking [1] 223:13
 choose [1] 167:19
 chronic [1] 200:1
 circulated [1] 169:12
 circumstance [2] 188:4;
 225:10
 cite [1] 238:18
 cited [1] 238:7
 cities [1] 226:16
 city [1] 193:21
 class [3] 200:17; 205:9;
 237:6
 classes [1] 200:16
 clear [1] 223:4
 Co [1] 163:19
 Coca [2] 227:11, 13
 coffee [2] 245:8, 12
 Cola [2] 227:11, 13
 colic [1] 213:1
 collect [1] 238:21
 Columbia [2] 259:3, 19
 combine [1] 177:21
 combustion [1] 182:16
 coming [2] 197:11; 231:9
 comment [7] 175:1;
 188:5; 209:8; 238:2;
 241:9; 243:10, 13
 commenting [1] 206:14
 comments [5] 168:10;
 238:5; 239:3, 4; 242:10
 Commerce [1] 163:9
 commerce [1] 202:22
 commercialized [1]
 231:21
 commingle [2] 190:15;
 191:2
 commingling [1] 190:21
 Commission [1] 259:20
 commission [1] 258:19
 Committee [2] 176:1, 2
 committee [2] 176:9, 20
 common [4] 213:15;
 216:20; 218:6; 256:12
 Commonly [1] 203:12
 commonly [1] 202:18
 community [1] 213:8
 COMPANY [2] 162:5, 9
 Company [2] 163:13;
 222:16
 company [10] 170:9;
 171:2, 6; 173:4; 230:3, 7,
 22; 231:13; 234:3; 240:3
 comparable [2] 178:8;
 208:20
 compared [1] 172:5
 comparison [1] 208:22
 compendium [4] 174:9;
 175:6; 176:13; 178:17
 competent [1] 175:20
 complete [2] 258:6, 11
 complicated [1] 238:9
 Component [1] 226:9
 component [1] 251:22
 compound [5] 182:19;
 185:20; 207:1; 238:8, 9
 compounds [4] 178:17,
 20; 179:9; 186:10
 concede [1] 224:7
 conceivable [1] 228:13
 concentration [3] 249:11,
 17; 250:14
 concentrations [6] 191:4,
 5; 205:2; 212:1; 216:14;
 221:2
 concept [1] 240:16
 concern [8] 197:16;
 200:2; 213:5; 223:12;
 224:1, 3, 5, 8
 concerned [3] 196:4;
 198:3
 conclude [1] 257:4
 concluded [1] 257:12
 conclusion [1] 231:9
 concurrence [2] 226:17,
 21
 conditions [9] 201:9;
 229:14; 245:5; 247:7, 8,
 20; 249:13; 253:16;
 254:14
 conducted [1] 182:8
 Conference [1] 176:5
 conference [2] 181:18;
 182:1
 confidential [1] 257:7
 confine [2] 253:9; 254:9
 conflict [1] 242:5
 confused [2] 228:1, 18
 confusing [3] 219:7, 10;
 254:11
 confusion [2] 184:1;
 228:3
 conjunction [1] 220:20
 Connecticut [1] 194:4
 connection [1] 198:21
 conscious [3] 192:14;
 195:10; 235:14
 consciousness [2] 193:7;
 194:11
 Conservation [1] 236:13
 consider [13] 175:20;
 188:3; 190:2, 22; 195:13;
 199:22; 204:7; 232:12;
 235:2; 251:1, 16; 253:21;
 256:14
 consideration [5] 192:10,
 21; 193:2, 4, 19
 considerations [1] 192:16
 considered [7] 192:19,
 20; 202:4; 207:14; 227:11;
 241:6; 245:9
 consistency [1] 183:12
 consistent [1] 182:22
 construction [1] 168:22
 consult [2] 179:13; 180:1
 consulted [1] 232:17
 contact [9] 173:1, 7;
 198:4; 211:21; 243:16;
 246:16, 22; 251:8, 14
 contain [1] 252:12
 contained [4] 168:3;
 252:17, 20; 253:9
 container [7] 182:4, 7, 9;
 226:7, 8, 9, 11
 containers [2] 181:16;
 182:2
 contains [1] 200:21
 contamination [7]
 192:12, 15; 193:3, 20;
 194:6, 9; 215:2
 content [2] 174:8, 13
 context [7] 180:14; 185:2;
 186:1, 8; 230:16; 231:15;
 233:17
 contexts [1] 180:16
 Continued [1] 162:16
 continued [2] 162:22;
 165:4
 continues [1] 172:14
 continuous [1] 211:21
 contradictory [1] 231:14
 contribute [6] 250:9;
 251:2, 3, 5, 16; 252:1
 contributes [1] 252:7
 contributing [1] 221:15
 control [3] 198:6, 10, 19
 controls [1] 198:14
 controversy [1] 213:7
 converted [1] 242:15
 copy [1] 166:1
 corner [1] 166:10
 correctly [1] 223:17
 Corroon [1] 163:3
 Corrosive [1] 216:7
 corrosive [2] 216:5; 218:9
 corrosives [1] 216:9
 COUNSEL [3] 165:8;
 243:19; 248:7
 counsel [4] 162:18;
 165:4; 259:10, 14
 COUNTY [1] 162:3
 couple [2] 205:3; 221:21
 course [1] 235:10
 COURT [1] 162:2
 Court [1] 162:20
 CRAIG [2] 162:20; 259:4
 cull [1] 238:21
 cup [2] 245:8, 11
 curiosity [1] 202:22
 Currently [1] 216:19
 currently [1] 168:22
 customers [1] 172:22
 cut [1] 208:8
 Cyanamid [4] 197:11,
 17, 18; 209:10
 Cyanide [1] 209:18
 cyanide [2] 209:13, 17
 - D -
 D-e-i-c-h-m-a-n [1] 179:4
 D.C. [1] 163:17
 damage [2] 219:2, 16
 data [5] 171:16; 198:16;
 199:3; 204:8; 216:13
 Date [1] 258:14
 date [8] 166:15; 167:7, 9;
 173:6; 186:2, 3, 4; 192:14
 dated [1] 166:16
 Dave [1] 172:13
 DAVID [1] 163:7
 day [3] 212:15; 258:16;
 259:16
 deal [2] 175:7; 234:12
 dealing [2] 197:12;
 198:14
 deals [1] 177:13
 dealt [2] 233:11; 239:15
 dear [1] 218:17
 death [4] 210:1; 223:13,
 18; 244:11
 debate [1] 236:21
 debated [1] 204:9
 December [3] 162:14;
 181:13; 259:16
 decided [4] 183:14, 15,
 18; 235:13
 deciding [2] 195:13;
 232:13
 deemed [1] 232:2
 deep [1] 195:2
 defatting [1] 211:20
 Defendant [2] 163:12, 18
 DEFENDANTS [2]
 165:8; 248:7
 Defendants [2] 162:11;
 165:5
 define [2] 189:7, 8
 definite [2] 167:15; 193:5
 definition [15] 180:15;
 182:22; 183:10, 14; 184:5;
 222:20; 223:20; 224:9, 11;
 245:10; 246:16, 22;
 247:17; 253:14; 254:4
 definitions [4] 184:3, 22;
 223:16; 229:8
 degree [9] 200:5; 209:2;
 212:5; 213:1; 244:11;
 245:6; 247:8; 249:14;
 255:22
 Deichman [1] 179:4
 DELAWARE [1] 162:2
 Delaware [3] 162:15;
 163:4, 5
 demonstrated [1] 186:12
 Department [3] 221:14;
 231:7; 239:10
 department [3] 170:7,
 15; 240:21
 depend [5] 245:5; 249:2,
 3; 250:2
 dependent [1] 201:6
 depending [2] 191:19;
 250:13
 depends [1] 248:18
 DEPONENT [1] 258:1
 DEPOSITION [2]
 162:13; 164:8
 Deposition [3] 162:16;
 165:18; 180:18
 deposition [6] 257:4, 12;
 258:4; 259:5, 7, 12
 describe [1] 187:1
 described [1] 218:15
 description [2] 179:8;
 242:6
 descriptions [1] 235:9
 descriptive [1] 184:21
 design [2] 168:21; 171:15
 designated [2] 237:13;
 257:6
 designed [1] 229:15
 desirable [1] 190:19
 desired [1] 236:20
 despite [1] 246:10
 destruction [1] 204:1
 detail [1] 206:9
 details [2] 237:9; 243:12
 detected [3] 213:3;
 229:16
 detective [1] 209:19
 determination [2]
 199:17; 240:17
 determine [4] 171:15;
 187:12; 192:18; 247:8
 determined [2] 229:15;
 230:2
 determines [1] 170:8
 detrimental [1] 251:22
 develop [3] 172:20;
 198:12, 13
 developed [6] 172:8;
 193:11; 209:5; 210:7;
 215:11; 216:18
 Development [2] 168:15,
 16
 development [3] 195:16;
 199:2; 213:6
 devices [1] 256:10
 dichloride [5] 206:19,
 20; 207:3, 9, 21
 dichlorobenzene [3]
 210:13, 20; 220:2
 dichloroethane [2]
 205:16; 206:18
 dichloroethene [2]
 190:4; 205:13
 differences [2] 242:9;
 243:2
 difficult [2] 195:20; 250:7
 difficulty [4] 173:3;
 174:7, 12; 238:20
 Direct [1] 170:6
 direct [7] 170:4; 182:13;
 190:10; 194:16; 220:10;
 228:5; 244:14
 directed [5] 207:11;
 230:20; 234:16; 251:13;
 253:1
 direction [1] 259:10
 Director [1] 166:19
 director [3] 167:8;
 232:16; 233:13
 discharge [1] 194:16
 discuss [1] 173:11
 discussed [5] 215:13;
 226:4; 229:5; 245:16;
 247:13
 discussion [1] 242:10
 disinfectant [1] 218:5
 disperse [1] 196:6
 disposal [5] 189:22;
 195:14; 196:2, 11; 232:13
 dispose [1] 191:1
 disposed [8] 190:14;
 191:16; 196:5, 8, 14;
 246:14, 20; 247:9
 disposing [1] 195:15
 dispute [1] 204:14
 distinct [2] 201:16;
 225:12
 distinction [5] 222:21;
 223:14; 224:2; 229:9;
 245:14
 distinctions [1] 224:4
 distress [2] 205:2; 212:2
 distribution [1] 175:14
 District [2] 259:3, 19
 disturbances [2] 214:4
 dividing [1] 193:2

Doctor [1] 257:11
document [7] 166:6;
168:5; 181:2, 5, 10;
238:7; 244:18
Documentation [1] 176:9
documents [1] 213:14
doesn't [2] 245:22; 252:6
door [1] 254:19
dose [3] 191:19; 201:9;
242:22
doses [6] 189:10; 210:1;
211:17; 214:3; 219:2;
243:1
doubt [3] 196:11; 235:15
Dr [13] 165:10, 21;
178:16; 180:21; 187:11;
200:15; 222:12, 15;
243:21; 248:10; 252:20;
257:9, 10
draw [1] 229:9
drawn [1] 245:14
drew [1] 222:21
Drexler [1] 162:19
drink [1] 182:6
drug [1] 186:2
Drugs [1] 179:5
duly [2] 165:5; 259:7
dumped [7] 187:4;
188:8, 9, 12; 189:1, 14;
215:5
dumping [1] 192:8
duration [8] 242:20;
249:15, 16, 18, 20;
250:15; 254:16; 255:9
dying [1] 225:22

- E -

earliest [3] 213:12; 214:9;
218:7
Early [1] 222:19
early [6] 165:13; 167:6;
169:11; 207:4; 213:14;
219:5
edited [1] 175:2
effect [20] 180:11;
184:12; 190:11, 22;
201:10; 202:6; 203:21;
204:2; 207:4, 15; 219:14;
223:3, 6, 12, 17, 20;
225:2, 21; 243:15; 245:13
effects [59] 182:18;
191:3, 6; 201:11, 17, 20;
202:1, 9; 203:2, 5, 13;
205:5, 8, 14, 18, 22;
206:4, 17; 207:18; 208:20,
21; 209:1, 12, 16; 210:2,
17; 211:7, 12, 15, 16;
212:4, 7, 18, 21; 213:5,
9, 21; 214:2, 7, 21;
216:1, 11, 16; 217:3, 18;
218:1, 4, 12, 21; 219:12,
21; 220:8, 22; 222:8, 22;
224:8; 231:12; 241:12;
242:6
effort [1] 239:18
efforts [5] 171:14; 221:6,
14; 234:15
elected [1] 237:12
element [2] 199:22;
255:22
Elkins [1] 177:7
elsewhere [3] 171:2;
231:1, 13
Elzufon [1] 162:18
emergency [1] 179:11
employed [2] 259:11, 14
employee [3] 200:3;
237:19; 259:13
employees [3] 169:21;
172:9, 21

end [2] 226:20; 234:14
endless [1] 235:7
ensure [1] 172:8
entail [1] 233:21
enter [2] 253:17; 255:1
enterchanges [1] 213:2
entitled [8] 173:14;
174:1; 175:3; 176:9;
177:16; 178:10; 179:5, 18
enunciated [1] 221:16
environment [8] 185:17;
186:9, 15, 17; 187:16;
232:3, 4, 6
Environmental [1]
236:10
environmental [18]
166:19; 167:8; 168:21;
170:20; 171:1; 230:5;
231:4, 12, 16, 17; 232:9,
16; 233:11; 234:4; 240:14,
21, 22; 241:3
EPA [1] 236:18
equals [1] 180:12
equate [1] 223:11
equating [1] 223:18
equipment [3] 200:9;
221:8; 256:10
Errata [1] 258:10
errors [1] 238:22
ESQ [3] 163:2, 7, 14
essays [1] 180:2
established [2] 176:15;
216:19
estimate [2] 255:5; 256:7
estimates [2] 254:14;
255:7
estimating [3] 251:1;
253:22; 255:22
estimation [4] 199:17;
222:8; 240:17; 255:10
et [1] 162:9
Ethene [2] 205:17, 18
ethyl [1] 211:1
Ethylene [1] 207:3
ethylene [4] 206:18, 20;
207:9, 21
evaluate [3] 171:16;
198:13; 234:11
evaluates [2] 170:8;
230:2
evaluation [4] 174:21;
199:2, 20; 235:4
evaluations [1] 174:10
evaporate [2] 195:1;
207:12
evaporates [1] 195:7
event [1] 240:18
everybody [1] 256:16
evidence [1] 204:14
exactly [1] 200:20
EXAMINATION [4]
164:2; 165:8; 243:19;
248:7
examination [2] 162:17;
165:4
examined [2] 165:6;
258:3
examines [4] 166:6;
168:5; 181:5; 244:18
example [4] 210:8;
224:21; 238:19; 240:5
exceeded [2] 191:5, 6
excellent [3] 234:19, 20;
235:3
except [1] 258:9
exceptional [1] 225:10
exceptions [1] 169:18
Excuse [1] 172:13
exercise [1] 247:21
Exhibit [8] 164:9, 10;

165:18; 180:17, 18, 22;
229:19; 244:13
existence [1] 177:2
existing [8] 172:5; 190:2;
230:6; 231:6, 19; 232:10,
11; 234:16
exists [3] 184:2; 186:20;
250:5
expander [1] 238:7
expect [2] 216:21; 240:5
expectation [2] 206:5, 11
expected [1] 182:18
experience [4] 184:11,
15; 195:17; 225:4
expertise [2] 173:22;
239:4
expiration [2] 186:2, 3
Expires [1] 259:20
expires [1] 258:19
explain [3] 183:3; 242:8;
253:5
explore [1] 244:3
expose [3] 199:13; 221:4
exposed [4] 199:16;
200:5; 221:1, 5
exposure [40] 176:18;
179:10; 182:15; 184:11;
196:20; 197:13, 20; 198:7,
19; 199:9; 200:5, 8, 10;
214:18; 215:20; 221:9;
229:13; 241:20; 242:21;
245:6; 247:7, 9, 10, 19,
20; 249:14, 16, 18, 20,
21; 250:9, 10; 253:17;
254:14; 255:9; 256:11,
19, 20, 21, 22
exposures [6] 179:11;
199:18, 21; 200:1; 203:22;
256:22
express [1] 183:5
extended [1] 180:2
extensive [4] 175:6;
234:19, 20; 235:3
extensively [1] 174:19
extent [4] 175:13; 198:9;
236:17; 250:10
extreme [2] 238:11, 12
eye [10] 202:14; 204:16,
17; 211:22; 216:9; 223:2,
5; 225:7, 11; 226:3
eyes [1] 224:20

- F -

face [1] 223:13
facilitated [1] 251:14
facilities [1] 235:7
fact [7] 208:10; 244:4;
245:22; 246:5; 253:19, 20
factor [5] 249:17, 19;
250:11; 251:15; 253:21
factors [10] 192:18;
195:12; 245:7; 248:18, 21;
249:1; 250:14, 15, 22;
256:2
fair [2] 188:21; 220:21
Fairhall [1] 177:16
fairly [3] 175:15; 219:14,
20
familiar [16] 173:12, 13;
177:8; 178:13; 179:20;
180:6; 184:19; 194:19;
200:17; 205:6, 18; 206:7;
208:2, 14; 210:22; 211:4
fashion [1] 192:8
fate [5] 171:1; 231:12;
232:13; 240:14, 18
FDA [2] 226:17, 20
feasible [1] 256:19
features [1] 214:6
fed [1] 194:4

Federal [2] 218:8; 238:1
federal [1] 227:6
fellow [1] 239:10
felt [2] 193:15, 16
field [1] 173:21
Fielding [1] 163:15
financially [1] 259:14
find [1] 178:4
fine [1] 181:4
finite [1] 191:4
fire [3] 188:2, 6, 16
First [2] 228:4; 230:8
first [13] 166:9, 18;
168:13; 170:6; 174:14;
181:9; 182:14; 213:10;
218:15; 223:16; 230:1;
242:21
flammability [1] 189:17
flammable [2] 187:22;
188:15
Floor [2] 162:19; 163:9
FLORIG [45] 163:7;
165:9, 17, 20; 166:5, 8;
168:6; 172:15, 17; 175:16;
180:17, 20; 181:6; 187:10;
192:22; 197:4, 8; 200:11,
13, 14; 203:17, 19;
207:17; 210:11; 215:19;
221:17, 19, 20; 222:12;
246:2, 8; 248:4, 8, 9;
250:19; 251:18; 252:10,
11, 18, 22; 253:3, 7;
254:1; 257:1, 11
Florig [1] 164:4
flow [1] 234:9
flowing [3] 192:9; 194:7,
16
fluid [1] 225:11
flushing [1] 214:5
focused [1] 182:1
follow-up [1] 222:17
follows [1] 165:7
food [1] 226:18
force [3] 197:7, 10, 14
foregoing [3] 258:3;
259:5, 7
forgotten [1] 229:7
Forig [7] 224:13; 229:22;
241:12, 22; 244:1; 245:17;
247:13
form [7] 207:6; 210:4;
215:15; 242:16, 19;
251:10
formalized [1] 231:7
formate [1] 208:12
forms [1] 243:5
forth [3] 188:2; 221:8;
254:16
forward [2] 171:16; 257:8
forwarding [1] 257:9
foster [1] 200:3
found [2] 183:12; 238:13
Foundation [1] 236:13
foundation [1] 251:11
fraction [1] 217:12
free [1] 194:7
freeze [1] 207:13
freezing [1] 207:14
frequently [2] 175:15;
180:1
front [1] 165:21
full [1] 182:14
fumes [4] 216:12, 14;
241:16, 19
function [1] 198:11
funnel [1] 234:5
future [2] 173:6; 183:19

- G -

G-e-r-a-r-d-e [1] 178:10

gas [1] 202:4
gasoline [1] 217:14
Gasses [1] 174:3
gasses [1] 201:15
gave [4] 167:7; 183:1;
210:13; 235:14
generalities [1] 256:15
generalization [1] 189:3
generalized [7] 206:10;
217:8, 10; 219:17; 220:15;
221:16; 239:5
GEORGE [3] 162:13, 16;
165:3
George [2] 164:3; 258:2
Gerarde [3] 178:9, 16;
179:4
gets [2] 225:1; 255:8
give [4] 193:10, 12;
205:15; 210:12
given [12] 190:5; 192:10;
193:3, 4, 19; 196:12, 17;
222:20; 253:16; 254:5;
258:7, 11
giving [1] 199:5
glanced [1] 173:19
glue [2] 219:15; 220:14
gm [1] 238:14
goal [4] 172:7; 199:8;
221:16; 236:20
goals [2] 171:10, 13
goes [4] 185:7; 218:6;
221:15; 250:13
gotten [4] 172:4; 194:8;
198:2, 3
govern [1] 190:3
government [2] 192:11
Governmental [1] 176:6
grad [1] 183:15
graduate [3] 177:2;
207:10; 210:8
gram [1] 238:14
great [2] 201:18; 206:9
greater [10] 182:17;
183:7, 17, 22; 184:8, 12,
14; 238:16; 255:18, 19
greatest [1] 198:9
grew [1] 193:21
ground [5] 186:11;
187:17; 195:4, 6; 196:2
ground-water [11] 187:5;
188:8, 11; 189:2; 191:18;
192:2, 12, 15; 193:3, 19;
195:14
grounds [1] 194:1
group [6] 170:20; 231:3;
237:14; 241:1, 3, 11
groups [4] 199:9; 200:2;
236:15, 22
growing [1] 193:7
grown [1] 194:11
guess [12] 176:19; 177:5;
192:6; 193:14; 214:5;
220:1; 223:19; 224:4;
232:20; 235:5; 241:19;
254:12
gut [1] 214:20

- H -

half [1] 212:15
hand [1] 259:16
Handbook [1] 174:2
handed [1] 180:21
handled [2] 173:9;
246:11
handling [1] 245:4
hands [1] 183:9
happens [2] 173:5;
240:19
harm [1] 223:21
harmful [2] 199:18; 206:6

Hartford [3] 193:22; 194:13
 Hazard [3] 247:18; 248:18, 20
 hazard [43] 214:17; 241:15, 21; 242:13; 244:5; 245:3; 247:1, 7, 8, 10; 249:10; 250:1, 6, 12, 16; 251:1, 4, 5, 9, 17; 252:1, 7, 15, 21; 253:12, 14, 15, 22; 254:5, 10, 13, 15, 18; 255:2, 5, 7, 10, 12, 15; 256:1, 7
 hazardous [9] 214:18; 246:1, 6, 17; 247:17; 248:14; 252:9, 12; 255:20
 Hazards [1] 173:15
 hazards [2] 245:15; 247:19
 heading [3] 166:12, 19; 170:5
 health [4] 168:21; 204:2; 246:7; 247:2
 hear [1] 252:22
 heard [4] 173:16; 174:4, 6; 208:3
 hears [1] 194:10
 heart [1] 218:18
 held [4] 167:2; 207:12; 236:12; 252:5
 help [2] 167:14; 253:6
 helping [2] 236:3, 7
 hereby [2] 258:2; 259:5
 Hexachlorobenzene [1] 211:9
 hexachlorobenzene [2] 211:5, 11
 Hexachlorophene [1] 211:8
 hexane [1] 211:13
 High [1] 211:22
 high [9] 189:9; 203:22; 205:1; 210:1; 211:17; 214:3; 216:5, 14; 219:2
 higher [2] 210:19; 220:6
 highly [1] 204:8
 hold [1] 245:15
 hope [2] 185:3; 190:1
 human [9] 204:8; 222:5; 244:5; 246:7, 16, 22; 247:2; 253:11; 254:8
 humans [38] 190:9, 11; 191:16; 202:2; 203:3; 205:5, 8, 14, 19; 206:1, 17; 207:4; 208:11; 209:12; 211:1, 3, 5, 11, 12; 212:18; 213:22; 214:14; 215:20; 217:3, 18; 218:1; 219:4, 11, 12, 21; 220:8, 22; 221:1; 222:2, 8; 244:5; 252:14; 255:15
 hydrocarbon [9] 200:21; 201:4, 7; 205:11; 211:15; 217:12, 15; 219:17; 220:15
 Hydrocarbons [1] 178:11
 hydrocarbons [9] 200:18, 20; 201:5, 12, 14; 207:2; 212:3; 217:17; 219:1
 hydrochloric [1] 216:4
 hydrogen [3] 200:22; 209:13, 17
 hydrogens [1] 201:2
 Hygiene [1] 175:3
 hygiene [1] 175:8
 Hygienists [1] 176:6
 hygienists [3] 171:11, 14; 220:20
 hypothetical [2] 192:4; 253:13

- I -
 i.e. [1] 182:17
 IBT [1] 166:10
 ice [1] 189:14
 identification [2] 165:19; 180:19
 IDENTIFIED [1] 164:8
 identity [2] 185:20; 186:11
 II [1] 162:10
 imagined [1] 256:22
 implement [1] 171:16
 implemented [2] 171:19; 237:2
 important [1] 203:16
 impose [2] 249:5, 6
 impression [1] 237:16
 inaccurate [1] 250:20
 inanimate [1] 216:9
 incident [5] 215:1, 4, 13; 241:22; 242:14
 incidents [1] 194:9
 include [4] 188:11; 191:10; 233:18; 244:11
 included [4] 203:1; 224:17; 236:3; 241:4
 includes [3] 192:10; 199:4; 256:4
 inconsistency [1] 183:3
 incorporated [1] 239:5
 increase [6] 250:1, 5; 251:8; 255:1, 15, 16
 increased [7] 251:2, 4, 5, 7; 252:15; 253:12; 254:9
 increases [1] 249:11
 increasing [3] 193:7; 213:4; 255:2
 increasingly [1] 172:4
 Indemnity [2] 163:18; 222:16
 indicate [1] 191:11
 indicated [33] 168:13; 170:22; 172:20; 174:17; 177:4, 14; 184:7, 13; 185:22; 187:15; 188:13; 189:4, 9, 17; 197:18; 198:11; 199:1, 11; 201:8; 207:20; 215:17; 217:16; 221:3; 228:10; 229:12; 231:1, 5, 18; 232:8; 233:19; 238:15; 242:11; 256:9
 indifferent [1] 196:13
 individual [4] 190:1, 2; 201:6; 251:21
 individuals [3] 192:12; 199:19; 221:9
 indulge [1] 199:6
 Industrial [6] 173:14; 175:3; 176:6; 177:8, 17; 179:19
 industrial [11] 171:11, 14; 175:8; 213:12, 15, 19; 216:20; 220:20; 221:11, 13; 256:13
 industry [7] 175:11; 198:18; 236:14; 237:11, 14, 17, 18
 inert [1] 215:7
 information [34] 168:3; 171:19, 22; 172:7, 20; 173:4, 6, 8; 175:17; 178:5, 8; 179:1, 16; 193:17; 198:13; 202:12; 203:7; 209:4; 210:7; 212:11; 217:2; 219:15; 221:7, 15; 231:8; 232:1; 234:5, 8, 22; 235:2, 17; 19; 238:21
 infrequently [2] 177:12

ingested [2] 215:11; 242:4
 ingestion [3] 215:21; 224:15; 243:14
 inhalation [4] 214:19; 216:12; 224:14; 241:16
 inhaled [1] 212:1
 inhibit [2] 250:9; 251:21
 initial [2] 234:15
 injection [1] 224:17
 injuries [1] 218:10
 injury [2] 219:11; 244:11
 input [1] 238:4
 Insofar [5] 196:1; 225:1; 249:16; 250:7; 255:18
 insofar [4] 183:19; 248:20; 252:17; 256:19
 instance [2] 186:1; 223:10
 instances [2] 213:16; 225:5
 Insurance [1] 163:13
 intended [3] 170:14; 179:9; 230:10
 intensity [3] 249:15, 20; 255:9
 intention [1] 221:4
 interest [7] 173:21; 177:15; 197:6, 9; 236:15; 239:11, 22
 interested [2] 196:19; 259:15
 interferes [2] 209:19, 21
 interpretation [2] 171:17; 199:12
 interpretations [1] 183:6
 interrelate [1] 249:21
 interrupt [1] 232:5
 introduced [1] 206:2
 invited [1] 169:18
 involve [2] 239:17; 253:16
 involved [12] 169:21; 170:12; 171:6; 189:20; 191:19; 199:6; 219:8, 9; 221:9; 227:9; 236:7; 248:22
 involves [1] 247:7
 involving [1] 215:1
 irritant [9] 189:18; 202:14; 204:16, 18; 216:5, 14; 222:22; 223:3
 irritating [1] 211:22
 irritation [4] 211:22; 216:15; 223:5, 7
 irritations [2] 223:22; 224:7
 Island [1] 194:18

- J -
 Jacobs [1] 173:13
 Japan [4] 215:2; 242:1, 7, 14
 jitters [1] 245:12
 job [1] 235:12
 journals [1] 235:8
 JR [1] 163:2
 judging [2] 234:6; 255:8
 judgment [1] 247:15

- K -
 keep [2] 185:13; 256:4
 killed [3] 225:7, 8, 18
 Kimmerle [1] 241:5
 kinds [3] 212:4, 13; 231:20
 Kirkwood [1] 167:16
 knowledge [32] 166:13; 169:14, 19; 171:8; 174:18; 190:10; 192:17; 200:19;

206:10; 207:1, 2, 22; 208:9, 16; 211:2, 10, 14; 217:5, 8, 9, 11, 20, 22; 219:17; 220:4, 10, 15, 16; 226:21; 233:15; 234:8; 245:19
 KNOWLES [2] 162:20; 259:4

- L -
 lab [1] 169:6
 labeling [1] 202:16
 Laboratory [1] 174:3
 laboratory [2] 168:22; 241:1
 Lack [1] 251:10
 lacks [1] 187:7
 lagoons [1] 196:2
 large [1] 201:1
 larger [1] 229:13
 last [3] 212:15; 240:18; 252:3
 late [4] 169:5; 194:15; 210:9, 10
 law [1] 162:18
 lead [9] 172:10; 212:1, 19; 213:1, 5, 9
 leading [4] 172:14; 246:2, 8; 247:3
 learn [1] 240:8
 leave [2] 252:6; 253:10
 lecture [1] 169:18
 legally [1] 191:12
 lesser [1] 255:21
 leukemia [2] 204:11, 13
 level [4] 201:9; 203:22; 220:5; 224:4
 levels [1] 224:2
 LEVINSKAS [4] 162:13, 16; 164:8; 165:3
 Levinskass [17] 164:3; 165:10, 21, 22; 180:21, 22; 187:11; 200:15; 222:12, 15; 243:21; 244:13; 248:10; 252:20; 257:9, 10; 258:2
 Liberty [1] 163:12
 library [1] 234:22
 lies [1] 228:3
 life [1] 215:10
 Limit [2] 176:3, 9
 limit [1] 176:15
 limited [4] 182:10; 208:9; 232:4; 243:14
 limiting [1] 236:20
 limits [2] 176:19; 237:21
 line [6] 169:6, 7; 192:4; 193:2, 6; 209:8
 liquid [4] 188:1, 15; 205:1, 11
 Liquids [1] 174:3
 liquids [3] 194:20; 195:1; 201:14
 listed [2] 167:14; 176:14
 literally [1] 235:7
 literature [11] 203:10; 204:4; 212:14; 215:14; 216:21; 217:1; 218:13; 219:5, 10; 235:13; 238:17
 lived [1] 167:16
 liver [4] 206:4, 6; 219:2, 11
 local [3] 206:21; 207:11
 location [1] 196:8
 long-term [5] 208:21; 229:2, 4, 7, 10
 Lopac [6] 181:16; 182:2, 4, 5; 226:10, 12
 loss [1] 233:22
 lot [4] 188:4; 192:20;

194:1; 228:20
 lower [3] 210:19; 216:5; 220:6
 - M -
 machine [1] 194:2
 main [2] 214:15; 241:15
 maintain [1] 186:11
 maintaining [1] 185:20
 major [2] 197:15; 224:13
 mammalian [5] 170:18; 222:7; 230:19; 231:1; 241:11
 man [3] 189:12; 222:9; 240:6
 manager [3] 168:14, 16; 235:11
 manifest [1] 254:21
 manifestation [2] 190:7; 223:7
 manifestations [1] 253:15
 manner [7] 190:14; 191:1; 192:13; 246:12, 15, 21; 247:9
 Manta [1] 163:8
 manufacture [1] 232:12
 MARILYN [1] 163:14
 Marilyn [1] 222:15
 Mark [1] 165:17
 mark [1] 180:17
 marked [6] 165:18, 22; 180:18, 22; 223:21; 244:13
 Market [2] 162:19; 163:10
 market [3] 226:15; 227:1, 19
 marketed [1] 226:14
 marrow [1] 204:1
 material [17] 173:2; 189:20; 192:21; 205:5; 208:7; 216:20; 220:21; 221:1; 240:19; 249:2; 251:7; 254:9, 16; 255:1, 3, 14, 16
 materials [11] 184:12; 187:3; 188:22; 190:13, 16; 191:15; 195:14; 196:21; 198:8; 217:16; 243:6
 matter [1] 221:11
 mean [10] 174:20; 180:9; 208:14; 210:15; 240:2, 11; 244:5; 246:1, 6; 252:3
 meaning [1] 231:16
 meaningless [1] 247:21
 measure [1] 200:8
 Medical [4] 169:1; 221:13; 231:7; 239:10
 medical [2] 220:21; 233:13
 medium [18] 250:4, 8, 15; 251:6, 14, 20; 252:4, 5, 6, 9, 12, 14; 253:8, 11, 21; 254:3, 8
 meetings [1] 236:12
 melt [1] 189:14
 melting [1] 187:18
 member [1] 221:13
 members [2] 201:19; 239:10
 memorable [1] 237:5
 memory [2] 228:22; 239:19
 mental [2] 214:4; 219:16
 mentioned [13] 174:15; 176:1; 205:4; 212:4; 213:10; 224:20; 233:18; 234:18, 21; 235:22; 236:2; 239:20; 250:14

mercurial [1] 215:12
 Mercury [2] 241:18;
 243:5
 mercury [29] 213:22;
 214:3, 14, 19, 20; 215:1,
 5, 6, 8, 10; 241:13, 16;
 242:1, 4, 6, 10, 11, 12,
 14, 15, 16, 20, 22; 243:1,
 3, 6, 9, 14, 16
 metabolized [1] 243:11
 metal-like [7] 242:11, 12,
 14, 22; 243:4, 8, 16
 metallic [1] 215:6
 method [1] 195:15
 methyl [4] 215:8; 242:15;
 243:4, 9
 mg [1] 238:15
 mid [2] 167:6; 194:15
 middle [1] 227:20
 migrate [1] 191:17
 migrating [1] 192:1
 mild [1] 223:11
 military [1] 225:6
 milligram [1] 238:15
 mind [3] 219:14; 238:6;
 249:8
 mine [1] 197:16
 minimal [1] 214:21
 minimize [5] 200:10;
 221:8; 256:10, 18, 20
 minor [2] 223:22; 224:6
 minute [1] 166:3
 minutes [1] 248:3
 misstatement [1] 207:6
 mix [1] 190:18
 mixture [3] 182:15;
 217:13, 16
 modified [3] 215:7;
 243:1, 11
 modify [1] 170:17
 moment [1] 181:3
 monitored [1] 204:3
 monitors [2] 170:8; 230:2
 mono [1] 220:2
 monograph [5] 174:4, 6;
 177:18; 178:17; 179:6
 monographs [1] 235:8
 MONSANTO [1] 162:5
 Monsanto [31] 168:13;
 169:13, 20; 170:1; 181:21,
 22; 187:2; 188:7, 22;
 190:12; 191:14; 197:17;
 198:1, 2; 226:14; 228:6;
 230:13; 232:18; 233:7, 8;
 234:18, 20; 236:1; 237:11,
 13, 17, 19; 239:5; 240:3,
 4; 257:6
 morning [2] 165:10, 11
 mouse [1] 204:12
 mouth [2] 242:22; 243:2
 MS [8] 222:14; 228:16;
 232:15; 243:18; 244:16;
 247:3; 248:2; 257:2
 Ms [3] 164:5; 244:1;
 247:13
 multi-faceted [1] 199:4
 mundane [1] 199:4
 muriatic [3] 216:2, 4, 12
 Mutual [1] 163:12
 myself [1] 235:13

- N -

N.W. [1] 163:16
 name [5] 182:5; 218:6;
 222:15; 225:19; 226:11
 namely [1] 244:9
 names [1] 181:20
 naphthalene [2] 217:4, 6
 naphthalenes [1] 219:9
 Naptha [1] 217:12

naptha [1] 217:7
 narcosis [1] 211:18
 nature [6] 174:7, 13;
 226:18, 19; 249:2; 250:4
 negligible [2] 247:10, 11
 nervous [1] 219:16
 newspaper [1] 194:9
 newspapers [1] 194:10
 nitrobenzene [1] 217:19
 non-acceptability [1]
 195:19
 non-hazardous [1]
 246:11
 non-toxicological [1]
 180:14
 normally [1] 225:9
 Notary [3] 165:6; 258:18;
 259:18
 note [1] 192:3
 noted [1] 258:9
 nowadays [1] 213:17
 NUMBER [1] 164:8
 number [4] 165:17, 22;
 166:10; 244:2
 numbers [2] 201:1;
 229:13

- O -

oath [3] 165:7, 14;
 248:11
 Object [2] 196:22; 215:15
 object [1] 197:2
 Objection [13] 175:12;
 187:6; 207:6; 210:4;
 228:7; 246:2, 8; 247:3;
 250:17; 251:10; 252:16;
 253:13; 254:11
 objection [4] 172:14;
 187:19; 192:3; 255:4
 objections [1] 189:13
 observed [1] 214:22
 obvious [1] 229:8
 Obviously [1] 185:3
 occasion [5] 171:18;
 179:13, 14; 184:10; 236:5
 occasions [2] 238:3
 occupational [3] 197:7,
 10, 14
 ocean [2] 186:20, 21
 October [1] 259:20
 offered [2] 237:21; 239:3
 officer [1] 259:4
 offices [1] 162:18
 oily [1] 194:2
 Okay [4] 169:9; 181:7;
 212:8; 229:21
 okay [1] 203:20
 older [1] 213:18
 once-upon-a-time [1]
 192:7
 one-time [1] 243:15
 ones [3] 245:18; 249:7, 9
 open [4] 188:14, 16;
 196:2
 operating [3] 200:8;
 240:3, 11
 operation [4] 198:11;
 199:4, 7; 235:5
 operations [1] 240:13
 opinion [3] 174:21;
 203:22; 256:17
 opposed [2] 213:16;
 237:11
 ORDER [1] 162:1
 Organic [1] 179:19
 organic [2] 208:1; 220:15
 organism [9] 252:4;
 253:20; 254:4, 6, 16, 17,
 18; 255:8, 11
 organisms [5] 215:8;

229:13; 231:11; 242:17;
 243:11
 organism [1] 253:18
 original [2] 183:14;
 223:19
 OSHA [2] 176:18; 240:6
 ought [1] 240:10
 outcome [1] 259:15
 outdoor [1] 186:9
 outfall [1] 194:3
 outside [7] 169:12;
 170:1; 181:21, 22; 231:2;
 254:17, 19
 overall [1] 199:3
 overly [2] 196:4; 205:6
 overriding [1] 197:16
 oxygen [2] 209:20, 22

- P -

P-a-t-t-y [1] 175:3
 p.m. [1] 257:13
 Page [1] 244:17
 page [8] 166:9, 18;
 168:19; 170:4; 182:13;
 229:20; 244:14, 16
 pages [1] 258:3
 painter [1] 213:1
 paper [1] 244:21
 papers [1] 215:18
 paragraph [9] 168:19;
 170:6; 182:14; 230:1, 8;
 231:15; 244:14, 17;
 245:10
 paraphrasing [1] 246:10
 part [5] 205:9; 221:15;
 235:22; 236:3; 239:18
 parties [3] 162:21;
 259:11, 14
 parts [1] 192:7
 pass [1] 198:14
 pathway [2] 224:18, 21
 pathways [2] 214:15;
 224:14
 Patty [2] 175:2; 178:7
 PCBs [1] 218:22
 pencils [1] 208:8
 Pennsylvania [1] 163:11
 people [46] 169:16;
 171:11, 22; 172:11;
 181:20, 21, 22; 183:5, 13;
 184:22; 193:14, 15; 196:3,
 20; 199:5, 6, 13, 16;
 200:5; 202:6; 204:2, 7;
 206:4; 214:4; 215:11;
 218:11; 221:4, 5; 225:8;
 234:1; 235:10, 12; 238:21;
 239:11, 20; 240:2, 12;
 241:6;
 9; 242:3, 18; 245:11;
 251:8
 period [5] 185:21;
 194:13; 227:18; 248:16;
 250:3
 periodicals [1] 202:20
 permissible [5] 176:18;
 191:7, 8, 12, 13
 permission [2] 191:9, 10
 permit [2] 188:14; 226:18
 persist [1] 185:16
 Persistence [1] 185:2
 persistence [9] 184:19,
 21; 185:7, 19; 186:1, 6,
 7, 13, 16
 persistent [4] 185:4, 5,
 12; 186:21
 persists [1] 187:15
 person [5] 235:17;
 251:15; 252:5, 6; 255:19
 personal [1] 233:22
 Personally [1] 174:18

personally [2] 175:20;
 182:8
 personnel [1] 220:21
 pertain [1] 237:6
 pesticides [2] 197:12, 19
 PETER [1] 163:2
 petroleum [2] 178:16, 20
 pharmacology [2] 183:9;
 206:21
 phenanthrene [1] 217:21
 Phenol [1] 218:5
 phenol [1] 218:2
 Philadelphia [1] 163:11
 phrase [1] 230:16
 physical [1] 201:21
 physically [1] 235:7
 physicals [1] 199:5
 picked [1] 202:12
 pipes [1] 194:3
 pit [3] 187:18; 188:1;
 189:14
 pits [1] 196:2
 Pittsburgh [1] 209:10
 place [6] 233:4, 9;
 236:21; 244:10; 248:13,
 15
 placed [2] 170:15; 188:15
 PLAINTIFF [1] 243:19
 Plaintiff [2] 162:6; 163:6
 plan [1] 171:16
 planning [1] 168:21
 plans [2] 170:8; 230:2
 plastic [1] 182:5
 please [1] 244:15
 pleased [2] 235:16, 18
 plumbism [1] 212:22
 plus [1] 180:12
 point [3] 224:5; 245:1;
 252:8
 poison [1] 209:18
 poisoning [2] 215:12;
 242:1
 Poisons [2] 173:15; 218:8
 poisons [4] 213:12, 15,
 19; 218:7
 polychlorinated [3]
 218:18, 19; 219:8
 population [2] 197:19,
 20
 portion [1] 231:4
 pose [1] 247:1
 poses [1] 244:5
 posited [1] 213:2
 position [4] 167:3;
 230:14; 232:16; 236:2
 positive [1] 227:4
 possibility [1] 241:19
 potential [17] 190:20;
 192:15; 196:20; 197:13,
 20; 198:7, 19; 199:9, 21;
 223:21; 247:19; 251:16;
 255:18, 21; 256:11, 20,
 22
 potentially [4] 221:1;
 250:5; 252:14; 253:11
 Potter [1] 163:3
 practical [1] 191:12
 practice [5] 175:7;
 190:22; 221:11; 256:13,
 15
 practices [2] 200:9; 221:7
 precautionary [1] 202:16
 precautions [4] 249:5;
 256:4, 6, 9
 predominantly [2]
 173:20; 177:13
 prefer [2] 184:7; 199:12
 preliminary [1] 250:17
 prepare [3] 167:17, 20;
 181:12

prepared [6] 166:14;
 167:5; 169:2, 8; 171:13;
 181:13
 preparing [2] 181:9, 11
 present [4] 162:21;
 168:20; 170:5; 253:21
 presentation [3] 181:15,
 20; 183:21
 previously [1] 165:5
 primary [6] 179:9;
 198:17; 199:8; 214:17, 18;
 235:12
 print [1] 259:9
 printed [1] 238:15
 Prior [1] 197:11
 problem [2] 193:15, 16
 problems [2] 189:15;
 204:22
 procedure [4] 233:4, 9,
 11; 234:4
 procedures [4] 172:8;
 198:12; 233:15; 236:19
 process [2] 225:2; 233:20
 processes [1] 228:6
 produce [15] 184:12;
 191:6; 203:22; 204:6;
 210:17; 211:18; 214:3, 5;
 215:8; 216:14; 219:2, 16;
 225:2; 244:10; 245:12
 produced [2] 212:7;
 219:11
 product [13] 168:14, 17;
 172:9; 173:5; 197:21;
 227:10; 231:21; 234:14;
 239:11, 12, 22; 240:12
 products [18] 172:6;
 182:16; 228:11; 230:6;
 231:6, 19; 232:9, 10, 11;
 233:12; 234:16, 17
 profession [2] 174:16;
 198:18
 professional [4] 169:17;
 194:20; 195:9, 16
 progressive [1] 229:17
 prohibitions [1] 192:8
 project [1] 227:9
 prolonged [1] 211:21
 prominent [2] 193:9;
 214:6
 propensities [1] 246:6
 properties [14] 187:4;
 190:6, 14, 16; 191:16;
 198:8; 201:6; 206:8;
 208:4, 11, 17; 210:22;
 211:4; 212:9
 property [4] 185:19;
 233:22; 244:8
 proposed [3] 236:22;
 237:22; 238:10
 protect [1] 199:8
 protecting [1] 196:20
 Protection [1] 236:10
 protection [4] 171:11;
 172:10; 199:3; 233:22
 PROTECTIVE [1] 162:1
 protective [3] 200:9;
 221:8; 256:9
 proven [1] 206:12
 provide [3] 193:17;
 231:22; 238:4
 provides [1] 176:13
 providing [1] 237:21
 prussic [1] 209:19
 Public [2] 165:6; 259:18
 public [2] 236:14; 258:18
 publication [4] 167:13;
 169:10; 176:8, 12
 publications [2] 168:8;
 173:10
 publish [1] 240:7

published [3] 215:18;
238:1, 10
publishing [1] 176:21
purporting [1] 207:7
purpose [1] 185:14
purposes [3] 172:19;
229:11; 234:12
pursuant [1] 162:17
Putting [1] 188:6
putting [1] 187:18

- Q -

qualitative [2] 210:14, 15
qualitatively [1] 220:3
quality [1] 204:13
quantitatively [1] 212:6
quantity [6] 192:1;
235:20; 248:14; 249:22;
250:2, 15
question [25] 171:3;
173:3; 181:9, 19; 185:7;
186:21; 187:6, 13, 20;
189:4, 6, 19; 191:21;
196:16; 197:2; 221:22;
223:2; 227:2; 233:1;
246:3, 9; 251:12; 252:16,
22; 253:2
questioning [1] 192:4
questions [12] 187:13;
196:10; 204:5; 222:17;
227:21; 231:20; 232:1, 22;
248:1, 5; 258:8, 12
quickly [2] 207:12; 237:3
quote [6] 223:21; 226:20;
234:2; 238:11; 241:10

- R -

rabbit [3] 225:8, 18, 22
Rain [1] 195:4
raised [1] 204:5
rationale [1] 236:20
reach [2] 252:14; 253:11
reaction [1] 196:15
read [9] 181:1; 215:3, 17;
218:19; 230:18; 244:15;
251:13; 253:1; 258:3
readily [1] 249:7
reading [4] 204:4; 209:7;
214:9; 218:9
reads [3] 182:14; 194:8,
10
real [1] 256:22
reason [2] 228:22; 235:15
reasonable [3] 177:5;
195:15; 256:12
reasonably [3] 196:3;
246:15, 21
reasons [4] 172:1; 186:5;
198:17; 238:18
recall [43] 166:15;
167:21; 173:17; 174:9, 14,
19, 22; 177:1, 4; 178:15;
179:7, 22; 181:9, 11, 18;
196:1, 4, 10; 197:15;
202:11, 13, 16; 203:13;
205:8; 206:20; 207:22;
209:9; 214:9, 17, 18;
215:1, 4; 216:11, 13;
217:12; 218:9; 222:2;
225:19;
226:17; 227:17; 228:12,
15; 229:1
recent [2] 213:4; 219:15
Recess [3] 200:12;
221:18; 248:6
recite [1] 206:9
recognize [1] 199:15
recognized [1] 213:12
recognizes [1] 221:4
recognizing [1] 247:20

recollection [13] 177:20;
180:2; 202:3; 204:12;
207:9, 21; 208:6; 216:3;
226:15; 228:9; 233:1, 3
recommendations [4]
198:15; 231:22; 236:17;
239:15
record [3] 200:13; 248:8;
257:5
recorded [2] 258:8, 12
records [1] 228:14
reddening [1] 223:10
reduce [2] 256:7, 10
reduced [1] 259:9
refamiliarize [1] 181:3
refer [10] 167:17; 175:14;
178:19, 21; 183:6, 7;
185:19; 186:13; 213:14,
18
reference [6] 167:12;
168:20; 175:10; 195:20;
238:11, 13
referenced [4] 212:14;
213:14; 216:21; 218:12
references [3] 166:16;
203:11; 212:17
referred [7] 176:2;
183:21; 194:13; 202:19;
203:10, 12; 241:5
referring [5] 191:8;
230:22; 232:6; 234:17;
245:18
refers [1] 166:11
reflected [1] 249:8
reflecting [1] 184:1
regard [7] 178:1, 22;
197:9; 223:5; 236:2;
245:13; 255:6
regarded [2] 174:15;
176:17
regarding [4] 195:18;
206:11; 240:7; 243:13
Register [1] 238:1
regularly [1] 179:15
regulated [1] 218:7
regulation [4] 192:11;
226:19; 238:10; 240:7
regulations [6] 188:14;
190:2; 236:22; 237:1;
238:1; 239:2
regulatory [6] 172:3;
191:9, 10; 227:7; 236:4, 7
Rein [1] 163:15
reiterate [1] 254:12
related [3] 201:20;
254:15; 259:10
relates [1] 255:11
relative [2] 168:11;
259:13
relatively [4] 177:21;
179:8; 224:6, 8
relevance [1] 187:9
relevant [1] 187:12
reliability [2] 176:19;
212:11
reliable [8] 175:17, 22;
176:17; 178:1, 2, 22;
179:16; 180:4
remember [7] 225:17;
227:18; 228:19; 229:3, 6;
237:20; 239:14
remind [1] 190:1
repeated [1] 243:1
repeatedly [1] 232:8
rephrase [2] 246:3; 253:3
replaced [1] 201:2
reported [1] 238:16
Reporter [2] 162:20;
259:1
reporter [2] 251:13;

253:1
reports [1] 169:22
represent [3] 222:16;
254:5; 255:20
representative [3]
237:10, 13, 18
representatives [1]
236:14
represented [1] 242:13
representing [1] 237:17
represents [1] 254:18
request [3] 169:16;
171:22; 257:5
required [3] 210:17;
212:7; 248:16
requirement [1] 172:3
reread [1] 251:12
research [1] 178:16
residence [1] 167:14
resources [1] 235:2
respect [8] 170:18;
192:16; 194:6; 197:6;
206:6; 207:13; 219:10;
222:7
respected [1] 174:16
respective [1] 162:21
respects [1] 220:3
respiratory [4] 204:21;
205:2; 212:2; 216:15
respond [5] 220:1; 228:8;
232:1; 233:10; 239:21
responding [1] 232:2
response [7] 189:4;
192:6; 196:18; 233:1;
239:2, 6, 8
responses [1] 243:2
responsibilities [2]
236:1, 3
Responsible [1] 230:5
responsible [1] 199:2
result [5] 178:17; 182:16;
227:6; 246:16, 22
resulted [2] 241:15;
242:1
results [2] 222:1; 235:16
resume [4] 166:1, 14;
167:18; 229:20
review [6] 209:7; 231:21;
233:9, 17; 234:1; 257:9
reviewed [1] 234:1
Rich [1] 241:5
Right [1] 201:11
right [25] 167:11; 168:18;
169:4; 170:16; 173:17;
174:6; 183:11; 184:9;
193:22; 197:5; 211:19;
213:21; 216:7; 222:13;
225:3, 14; 228:17; 238:12;
244:10; 248:13, 15;
251:19; 254:2
right-hand [1] 166:9
risk [3] 223:18; 245:4;
255:5
risks [1] 188:1
River [2] 193:22; 194:4
river [1] 194:3
role [1] 227:22
room [1] 179:11
route [2] 214:18; 241:20
routes [2] 189:22; 234:8
rows [1] 235:8
run [2] 188:1; 228:4
running [1] 193:22

- S -

safely [1] 246:11
safety [7] 168:17; 172:9,
21; 181:15; 200:3; 221:11;
256:13
Salt [1] 186:20

salt [3] 186:20; 189:9, 13
SANDBECK [9] 163:14;
222:14; 228:16; 232:15;
243:18; 244:16; 247:3;
248:2; 257:2
Sandbeck [4] 164:5;
222:15; 244:1; 247:13
saturated [1] 195:5
saying [2] 233:10; 241:9
scenario [1] 222:9
School [1] 169:1
school [3] 183:15;
207:10; 210:8
science [1] 241:3
sciences [2] 170:20;
241:1
scientific [2] 213:8;
215:14
scientists [1] 204:14
sea [1] 215:10
searches [1] 235:13
seawater [1] 215:2
second [5] 170:5; 229:22;
231:4; 244:14, 17
section [3] 170:7, 15;
235:11
sections [2] 175:7, 14
sell [1] 240:12
send [1] 173:4
sense [8] 198:22; 199:14;
210:14, 15; 223:12; 237:9;
251:22; 256:12
sensitive [2] 222:10
sentence [4] 170:6;
182:14; 230:1, 4
separated [1] 173:6
series [3] 177:20; 229:17;
236:16
serious [2] 188:1; 218:10
seriousness [1] 223:20
service [1] 194:5
setting [1] 236:11
severe [1] 229:14
severity [1] 212:7
Sheet [1] 258:10
shelf [1] 185:11
shops [1] 194:2
short-term [7] 208:20;
209:1; 228:10, 13, 18, 21;
229:10
show [1] 191:20
Signature [1] 258:14
significance [2] 171:18;
198:15
significant [3] 203:21;
204:2; 236:9
signing [1] 257:9
signs [4] 215:11; 245:4;
254:21; 255:6
simple [5] 182:18; 184:4;
191:22; 209:14; 238:8
simultaneous [1] 182:15
single [2] 191:22; 242:22
site [1] 207:11
situation [2] 186:7; 187:1
Skin [1] 216:9
skin [18] 189:18; 202:13;
204:16, 18; 211:20, 21;
214:5, 20; 216:7; 218:10;
223:6, 10, 11, 22; 224:7;
225:12; 242:12; 254:20
smallness [1] 178:3
sniffers [2] 219:15;
220:14
snow [1] 187:18
So-called [1] 212:22
so-called [2] 176:15;
215:8
soak [2] 194:20; 195:3
soaks [2] 195:4, 6

societal [1] 195:18
societies [1] 169:17
sodium [3] 187:15, 16;
189:13
soft [1] 182:5
soil [7] 187:4; 188:8;
189:1; 191:17; 192:2;
194:21; 195:14
solicited [1] 238:2
Solids [1] 174:2
solids [1] 201:14
solvent [4] 204:17;
205:20; 206:15; 211:15
Solvents [2] 173:15;
179:19
solvents [7] 180:3;
205:10; 206:10; 208:1;
211:17; 219:18; 220:16
somebody [3] 187:17;
237:14, 15
someone [2] 173:7; 228:5
somewhat [5] 180:2;
210:17; 217:13; 220:13;
228:1
somewhere [4] 173:7;
193:8; 194:11; 209:8
SOPs [1] 234:2
sorry [5] 174:13; 203:18;
211:10; 232:5; 234:19
sort [8] 186:22; 223:14;
225:12; 226:6; 228:4;
236:19; 238:19; 249:21
sorts [1] 235:9
Sound [1] 194:18
source [1] 178:22
sources [3] 178:7; 238:2;
239:13
speak [5] 171:13; 174:17;
247:19; 256:14, 15
specialty [1] 177:15
species [1] 222:10
specific [23] 166:15;
176:22; 195:21; 201:13;
206:22; 207:21; 211:2, 14;
216:13; 217:5, 9, 20, 22;
220:4, 10, 16; 227:9;
232:22; 237:9; 238:6;
239:14; 241:8; 245:19
Specifically [1] 236:6
specifically [6] 205:7;
210:6; 218:15; 228:11, 19;
237:18
specificity [1] 187:7
specify [1] 203:15
Spector [1] 174:1
speculate [1] 188:19
speculation [2] 175:12;
215:16
Square [1] 163:9
ss [1] 259:2
stand [1] 223:19
standard [2] 233:4, 8
standardized [1] 240:15
standards [6] 195:18;
236:4, 6, 8, 11; 237:20
standing [1] 172:14
start [2] 195:22; 234:3
started [5] 176:20; 177:5,
6; 193:8; 197:12
STATE [1] 162:2
state [3] 201:21; 209:11;
230:11
stated [2] 231:14; 241:15
statement [3] 244:20;
250:18; 252:3
States [2] 226:16; 259:2
states [1] 230:1
stay [1] 183:16
staying [1] 185:15
stays [1] 254:3

step [1] 256:12
 steps [3] 227:9; 229:18; 256:18
 stick [2] 228:22; 239:18
 stop [1] 208:8
 stored [6] 187:4; 191:16; 250:5, 8; 251:7
 stories [1] 209:19
 stream [3] 194:17; 207:11; 233:5
 streams [8] 192:9; 227:22; 228:6, 11; 232:19; 233:9, 18, 21
 Street [3] 162:19; 163:10, 16
 strength [1] 216:5
 strengths [1] 216:6
 Strike [1] 252:10
 strike [1] 246:18
 stringent [1] 172:4
 student [1] 177:2
 studied [2] 207:10; 222:11
 studies [10] 178:18; 182:8; 204:11, 13; 206:22; 229:5, 7, 12, 17; 234:22
 study [4] 182:10; 226:5; 229:10
 styptic [1] 208:8
 subdivision [1] 225:13
 SUBJECT [1] 162:1
 subject [6] 213:7; 217:9, 20; 218:17; 220:11; 233:21
 Subscribed [1] 258:15
 subsequently [1] 226:22
 subset [1] 224:22
 substance [3] 187:22; 242:4; 252:13
 substances [1] 241:13
 substantial [1] 202:21
 substeps [1] 225:15
 substitute [1] 206:3
 sufficient [2] 235:19; 248:13
 sufficiently [2] 189:9; 252:8
 suggestion [1] 237:14
 suggestions [2] 171:17; 198:15
 suggestive [1] 204:13
 summaries [2] 175:8; 176:14
 summarily [1] 227:4
 SUPERIOR [1] 162:2
 supervise [1] 170:7
 supervised [1] 230:21
 suppose [1] 234:12
 supposed [1] 230:21
 SURETY [1] 162:8
 surface [1] 225:13
 surfaces [1] 216:10
 surrogate [1] 233:14
 susceptible [2] 222:6
 swallowed [1] 214:20
 swallowing [1] 242:12
 swelling [1] 223:11
 sworn [3] 165:5; 258:15; 259:7
 symposia [1] 236:12
 synergism [2] 183:6, 10
 synergistic [2] 182:16; 183:4
 synergy [8] 180:6, 11, 14, 15; 183:1, 15, 20; 184:5
 synonymous [1] 249:16
 system [1] 219:16
 systemic [1] 223:8

- T -

table [2] 189:9, 13
 talk [5] 186:6, 7, 9; 232:9, 10
 talked [8] 182:6; 202:19; 203:11; 212:15; 214:15; 242:21; 249:13, 14
 talking [11] 170:17; 171:4; 197:3; 216:22; 230:19; 234:13; 242:10, 19, 20; 243:1; 256:2
 talks [1] 213:16
 tend [1] 194:20
 term [19] 180:6, 9; 183:4, 13, 20; 184:6, 19, 21; 186:19, 22; 191:11; 229:12, 17; 231:11; 232:3, 4; 240:16; 252:17; 255:13
 terminology [2] 213:15, 20
 terms [8] 184:16; 193:13; 195:1, 2; 197:21; 208:19; 223:6, 20
 test [6] 171:16; 226:15; 18; 229:2, 13; 240:20
 testified [1] 165:6
 testimony [10] 168:11; 199:11; 207:7; 222:19; 226:4; 228:1; 233:20; 250:18; 259:6, 8
 testing [25] 169:22; 170:9, 13, 18, 21; 171:1, 5; 198:12; 228:10, 21; 230:3, 13, 21; 231:1, 2, 11, 22; 232:21; 236:11, 18, 19; 240:14; 241:2
 tests [7] 170:14; 198:12; 222:1; 226:3; 228:5, 12, 13
 tetrachloride [2] 206:3, 4
 text [1] 177:7
 textbook [1] 183:9
 textbooks [1] 184:3
 texts [5] 173:11; 202:19; 203:1, 10; 213:18
 Thank [5] 172:16; 232:7; 247:22; 257:10, 11
 thank [1] 222:12
 thereafter [1] 259:9
 therein [3] 168:3; 258:8, 12
 thereto [1] 259:14
 thereupon [1] 183:14
 thinking [2] 223:6; 256:21
 third [1] 182:14
 thousand [1] 238:16
 thousands [1] 226:2
 three [7] 184:15; 214:14; 224:13; 225:5, 15; 226:1, 16
 Threshold [2] 176:2, 9
 threshold [1] 176:15
 throw [1] 187:17
 ties [1] 231:17
 timeframe [5] 171:4; 193:10; 194:12; 195:21; 203:15
 timeliness [1] 235:20
 times [7] 169:19; 190:17, 18; 226:1; 231:5; 238:16; 251:4
 tissue [3] 207:11, 13, 14
 tissues [1] 209:22
 title [2] 167:8; 168:13
 TLV [1] 176:1
 TLVs [1] 176:21
 toluene [3] 219:13, 15; 220:13
 totally [1] 196:13

toxic [88] 184:11, 12; 187:4; 189:10; 190:6, 14, 16; 191:16; 195:14; 196:21; 198:8; 201:5, 9, 11, 16; 202:1, 8; 203:2, 5, 13; 205:5, 13, 22; 206:7, 13, 17; 207:4, 15, 18; 208:4, 11, 17; 209:12, 16; 210:2, 22; 211:4, 7, 12; 212:18, 21; 213:9, 21; 214:2, 7, 14; 216:1, 11; 217:3, 18; 218:1, 21; 219:12, 21; 220:5, 8, 22; 222:20; 223:3, 6, 12, 16, 20; 224:7, 10, 11; 241:12; 242:6; 244:4; 245:9, 13, 22; 246:5, 14, 20; 249:11, 12, 22; 250:5, 12, 13; 251:6; 252:13; 253:8, 9; 254:7, 22; 255:15
 Toxicities [1] 174:2
 Toxicity [1] 179:19
 toxicity [44] 169:22; 170:9, 13, 14, 21; 171:5; 174:10; 175:8; 182:17; 188:18; 189:1, 7, 8, 16, 18; 190:7; 191:20; 201:20; 211:2; 213:16; 222:1, 7, 21; 223:8; 228:5; 229:16; 230:3, 13, 19; 231:11; 232:18, 21; 233:5; 238:11, 16; 244:2, 7; 245:4, 15, 19; 246:10; 253:16; 254:21; 255:6
 toxicological [2] 174:16; 243:15
 toxicologist [5] 171:14; 198:5; 199:1; 220:19; 241:7
 toxicologists [4] 171:10; 175:21; 241:4, 11
 Toxicology [6] 174:2; 175:3; 177:8, 17; 178:10; 179:5
 toxicology [9] 166:20; 167:9; 170:7; 176:14; 177:21; 180:7, 10; 205:6; 232:17
 tract [1] 216:15
 trade [2] 182:5; 226:11
 transcript [2] 257:6, 8
 transcription [3] 238:22; 258:7, 11
 transformation [1] 243:8
 translating [1] 222:1
 translation [1] 222:5
 transmitted [1] 242:17
 transposed [1] 238:14
 Travelers [2] 163:18; 222:16
 treatment [3] 178:4; 179:10, 11
 trichlorethane [1] 206:2
 trichlorethene [1] 205:7
 trichlorobenzene [1] 219:22
 trichloroethane [4] 205:22; 206:5, 8, 12
 Trichloroethene [2] 190:6; 205:4
 trichloroethene [1] 189:20
 trichloroethylene [1] 220:9
 trivial [1] 224:6
 trouble [2] 252:19, 21
 troubled [1] 183:8
 true [17] 170:12; 173:2; 185:15, 16, 18; 197:17, 22; 198:20; 212:3, 5;

245:16; 247:12, 15; 253:12; 256:13; 258:6, 10
 Trust [1] 163:4
 twice [1] 169:16
 two-minute [1] 221:17
 type [1] 240:20
 types [1] 243:3

- U -

ultimate [1] 232:13
 ultimately [3] 172:10; 194:18; 234:1
 unable [3] 174:20; 193:16; 209:11
 uncertain [1] 221:2
 uncommon [1] 225:21
 uncontrolled [1] 221:2
 understand [5] 165:14; 223:17; 248:10; 252:8; 253:2
 understanding [3] 171:21; 187:21; 230:18
 undertake [2] 198:12; 231:22
 undoubtedly [2] 193:14; 200:4
 unison [1] 199:10
 United [2] 226:16; 259:2
 University [1] 209:9
 university [1] 221:12
 unknown [3] 192:2; 200:2, 6
 unlikely [1] 241:20
 untreated [1] 188:9
 upper [1] 166:9
 useful [3] 178:4; 185:12, 13
 user [3] 197:21; 227:13; 249:5
 users [1] 172:9
 uses [5] 230:6; 231:6, 19; 233:12; 234:16
 utility [3] 171:18; 234:11, 13
 utilization [1] 209:22

- V -

vague [4] 187:6; 192:5; 197:2; 254:11
 value [1] 234:13
 Values [2] 176:3, 10
 values [1] 176:16
 Vapor [1] 241:17
 vapor [3] 214:19; 241:18, 20
 varied [1] 248:21
 varieties [1] 200:22
 variety [11] 172:1; 179:9; 180:3; 188:19; 192:17; 201:18; 241:13; 243:5; 245:6; 248:18, 21
 vary [1] 212:6
 vessel [1] 188:16
 vicinity [1] 168:22
 view [4] 175:17; 179:16; 180:4; 223:3
 vinyl [5] 201:22; 202:1, 3, 13, 15
 virtually [1] 192:9
 visited [1] 235:6
 visual [1] 214:3
 visualize [1] 174:12
 visualizing [1] 174:7
 volatile [10] 187:22; 195:1; 205:1; 211:17; 212:3; 217:14, 15; 219:19, 20; 220:17
 Volume [1] 162:10
 volume [1] 178:3
 vs [1] 162:7

- W -

WALSH [37] 163:2; 166:3; 172:13, 16; 175:12; 187:6; 192:3; 196:22; 197:2, 5; 203:15, 18, 20; 207:6; 210:4; 215:15; 228:7; 232:5; 243:20; 244:17, 19; 246:3, 4, 13, 18, 19; 247:5, 22; 250:17; 251:10; 252:16; 253:2, 5, 13; 254:11; 255:4; 257:3
 Walsh [1] 164:6
 wanted [6] 187:3; 188:7; 190:13; 191:15; 198:6; 231:10
 wants [2] 186:22; 256:7
 Washington [3] 163:17; 169:1; 236:12
 waste [13] 188:9; 196:2, 7; 215:5; 227:22; 228:6, 11; 232:19; 233:5, 9, 18, 21
 wastes [5] 190:18, 20; 194:2; 196:5, 11
 water [7] 188:10, 12; 192:9; 194:7, 16, 17; 243:11
 Wednesday [1] 162:14
 Welge [1] 163:8
 Whereupon [2] 165:2; 257:12
 Whichever [1] 167:19
 widely [1] 215:13
 widespread [1] 213:19
 Wiley [1] 163:15
 Wilmington [2] 162:15; 163:5
 withdrawn [2] 227:1, 3
 WITNESS [3] 164:2; 247:4; 251:12
 Witness [6] 166:6; 168:5; 181:5; 244:18; 258:14; 259:16
 witness [2] 259:6, 8
 won't [1] 168:7
 wondering [2] 224:21; 242:7
 word [5] 175:21; 238:12; 252:2, 19, 21
 work [3] 197:7, 10, 14
 worked [7] 187:2; 188:6, 22; 190:12; 191:14; 202:15; 205:16
 workers [5] 198:7, 19; 199:3, 8; 200:1
 working [7] 199:9, 15; 200:3; 220:20; 223:15; 225:6; 234:3
 workplace [1] 232:4
 workshops [1] 236:16
 worst [1] 222:8
 wouldn't [1] 198:6
 written [1] 168:4
 wrote [1] 230:17

- X -

x-rays [1] 213:3
 Xylene [1] 220:13
 xylene [1] 220:12

- Y -

year [2] 176:22; 177:4
 years [7] 172:4; 195:17; 198:2; 213:4; 225:20; 232:21; 235:5
 Yesterday [2] 227:21; 234:18
 yesterday [13] 167:2; 170:19; 173:11; 176:1;

182:6; 199:11; 214:16;
221:22; 222:19; 226:4;
233:20; 241:5; 247:14
youngster [1] 193:21
youngsters [1] 213:6
yours [1] 185:1
yourself [3] 167:20;
181:3; 208:8

LEVINSKAS: MONSANTO vs. INSURANCE COS.

Page 1 of 2

CORRECTIONS TO DEPOSITION-George J. Levinskas Dec 22-23, 1992

Page	Line	Correction:
13	13,15	SPELLING
14	5	MISSPOKE - SHOULD BE PRODUCT AS ON LINE 8
19	4	SPELLING
19	16	"INTENDED" CONVEYS PURPOSE OF RESEARCH
25	20	SPELLING
28	2	SPELLING
28	17	"INTENDED" CONVEYS PURPOSE OF RESEARCH
28	18	SPELLING
32	15	SPELLING
50	5	SPELLING
52	9	CLARIFY PHRASING
52	7	PUNCTUATION CLARIFIES RESPONSE
69	1	SPELLING AND CLARIFY STATEMENT
69	9 to 12	CLARIFY RESPONSE
73	17	SPELLING
76	2	SPELLING
82	2	WORD CORRECTION
103	6	CONVEY INTENDED RESPONSE
104	3	SPELLING
106	19	WORD CORRECTION
107	9	SPELLING
111	2	SPELLING
112	17	SPELLING
116	15	SPELLING
125	18	FINISH WORD
135	9,10,14	CONVEY INTENDED RESPONSE
201	3	SPELLING
206	20,21	DELETE. MISSPOKE. ETHYL CHLORIDE HAS LOCAL ANESTHETIC USE

