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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
)
PROPOSED AMENDMENTS TO)
TIERED APPROACH TO) R09-9
CORRECTIVE ACTION) (Rulemaking
OBJECTIVES (35 ILL. ADM.)
CODE 742))

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STATE OF ILLINOIS
Pollution Control Board

Proceedings held on January 27, 2009, at 10:35 a.m., at
the Illinois Pollution Control Board, 1021 North Grand
Avenue East, Springfield, Illinois, before Richard R.
McGill, Jr., Hearing Officer.

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Board Members present:
Chairman G. Tanner Girard
Board Member Gary L. Blankenship
Board Member Thomas E. Johnson
Board Member Shundar Lin

Board Staff Members present:
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1		INDEX	
2	WITNESS		PAGE NUMBER
3	IEPA Panel		
	Gary P. King		12
4	Tracey Hurley		22
	Dr. Thomas Hornshaw		24
5	Dr. Atul Salhotra		69
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

	EXHIBITS	
	NUMBER	ENTERED
1		
2		
3	Hearing Exhibit No. 1	9
	Hearing Exhibit No. 2	10
4	Hearing Exhibit No. 3	10
	Hearing Exhibit No. 4	10
5	Hearing Exhibit No. 5	10
	Hearing Exhibit No. 6	10
6	Hearing Exhibit No. 7	11
	Hearing Exhibit No. 8	11
7	Hearing Exhibit No. 9	11
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
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21		
22		
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PROCEEDINGS

(January 27, 2009; 10:35 a.m.)

HEARING OFFICER MCGILL: Good morning. I'd like to welcome everyone to this Illinois Pollution Control Board hearing in Springfield today. My name is Richard McGill, and I'm the hearing officer for this rulemaking proceeding docketed as R09-9 and captioned, "In the Matter of: Proposed Amendments to Tiered Approach to Corrective Action Objectives, 35 Illinois Administrative Code 742," better known as TACO.

Briefly, by way of background, on September 3, 2008, the Board received a rulemaking proposal from the Illinois Environmental Protection Agency. The Agency proposes to amend the Board's TACO rules in order to add the indoor inhalation exposure route to TACO's risk-based methodology as well as update remediation objectives for all exposure routes. Today is the first hearing. Another hearing is scheduled for March 17 and 18, 2009, in Chicago.

Also present today on behalf of the Board is Board Member Dr. Shundar Lin to my far left; next to him, Board Member Gary Blankenship; Chairman Tanner Girard; the lead board member, Thomas Johnson; and to my right, our technical unit, Anand Rao and Alisa Liu.

1 To make today's hearing as efficient as possible,
2 I issued an order on October 20 requiring the filing of
3 prefiled testimony, prefiled questions and prefiled
4 answers. We will begin today by entering those materials
5 into the record as if read, as well as designating a
6 number of hearing exhibits. The Agency's witnesses who
7 prefiled testimony will be giving summaries of their
8 testimony, and Agency witness Dr. Atul Salhotra will
9 present a slide presentation and give his associated
10 testimony. That will be followed by questions for the
11 Agency's witnesses, who will be responding today as a
12 panel. After that, we will allow anyone else to testify,
13 time permitting. Toward the conclusion of today's
14 hearing we will take up a number of procedural items and
15 discuss a potential prefiled testimony filing deadline
16 for the second hearing. We do have this room reserved
17 for tomorrow if business still remains at the end of
18 today. Otherwise, we will conclude the hearing today
19 with those procedural items I mentioned.

20 Today's proceeding is governed by the Board's
21 procedural rules. All information that is relevant and
22 not repetitious or privileged will be admitted into the
23 record. Those who testify will be sworn in and may be
24 asked questions about their testimony. For those who

1 wish to testify but who did not prefile testimony, we
2 have a witness sign-up sheet located at the back of the
3 room. I would ask for the court reporter transcribing
4 this proceeding if you would please speak slowly and not
5 talk over one another. Please speak up so we'll have a
6 clear transcript for the Board to review.

7 We learned this morning that Dr. Salhotra has
8 been delayed somewhat. He's in transit. He's expected
9 to be here by around noon. Depending on the progress we
10 make, how many follow-up questions we have for the
11 Agency's witnesses, we will take an hour lunch break
12 unless it looks like we're in a position to wrap up
13 without breaking, in which case we'll just forge ahead.
14 Are there any questions about our procedures today?

15 Seeing none, I'm going to take up one procedural
16 item that I normally would take up toward the end of the
17 day, but given Dr. Salhotra's delay, I thought we might
18 as well take care of this matter right now. It concerns
19 the Board's request to the Department of Commerce and
20 Economic Opportunity for an economic impact study.
21 Section 27(b) of the Environmental Protection Act
22 requires the Board to request that the Department of
23 Commerce and Economic Opportunity conduct an economic
24 impact study, or EcIS, on proposed rules before the Board

1 adopts the rules. DCEO may within 30 to 45 days of the
2 request produce a study on the economic impact of the
3 proposed rules. The Board must make the economic impact
4 study or DCEO's explanation for not conducting one
5 available to the public at least 20 days before a public
6 hearing. On October 7, 2008, the Board sent DCEO a
7 request to conduct an EcIS on the Agency's rulemaking
8 proposal. DCEO has not responded to the Board's request.
9 Is there anyone who would like to testify regarding this
10 matter?

11 Seeing no response, I will move on to address the
12 prefiled testimony. Absent any objections, the prefiled
13 testimony, questions and responses will be entered into
14 the record as if read. After that I'm going to be
15 designating these as hearing exhibits. It'll make it a
16 lot easier to cite them later if we give them a specific
17 hearing exhibit number. Any questions at this point?

18 Okay. Seeing none, first, is there any objection
19 to entering as if read any of the prefiled testimony of
20 Thomas Hornshaw, Gary King or Tracey Hurley? Seeing
21 none, each is so entered. Next, is there any objection
22 to entering as if read any of the prefiled questions of
23 Gail Artrip or the Illinois Environmental Regulatory
24 Group? Seeing none, each is so entered. Finally, is

1 there any objection to entering as if read any of the
2 prefiled responses of the Agency? Seeing none, each is
3 so entered. Again, for ease of later citation, I will
4 now take up designating each of the prefilings as hearing
5 exhibits. I'm sorry. Go ahead.

6 MS. GEVING: Mr. Hearing Officer, we also
7 wanted to know if you were going to enter Dr. Salhotra's
8 slides as an exhibit, because that's --

9 HEARING OFFICER MCGILL: I was going to take
10 that as an exhibit. I can do that after his presentation
11 or can take care of it now. I was just going to make
12 that a hearing exhibit since it wasn't actually
13 testimony.

14 MS. GEVING: I have copies of all the
15 documents now if you'd like them, including errata sheets
16 number 1 and 2.

17 HEARING OFFICER MCGILL: Perfect. I can
18 take those now. Thank you. Okay. First, is there any
19 objection to designating as a hearing exhibit the
20 Agency's errata sheet number 1, which was filed with the
21 prefiled testimony? Seeing none, that is Hearing Exhibit
22 No. 1. Is there any objection to designating as a
23 hearing exhibit the Agency's errata sheet number 2, which
24 was filed with the prefiled responses? Seeing none, that

1 is Hearing Exhibit No. 2. Okay. Is there any objection
2 to designating as a hearing exhibit the prefiled
3 testimony of Gary King along with its attached document
4 entitled "Instances of Vapor Intrusion Risk at Sites in
5 Illinois"? Seeing none, we'll make that Hearing
6 Exhibit 3.

7 Next, is there any objection to designating as a
8 hearing exhibit the hard copy of the colored slide show
9 presentation of Dr. Atul Salhotra? Seeing none, that
10 will be Hearing Exhibit 4. Next, is there any objection
11 to designating as a hearing exhibit the prefiled
12 testimony of Thomas Hornshaw along with his attached CV?
13 Seeing none, that will be Hearing Exhibit 5. Next, is
14 there any objection to designating as a hearing exhibit
15 the prefiled testimony of Tracey Hurley? Seeing none,
16 that will be Hearing Exhibit 6.

17 And before designating the prefiled questions as
18 hearing exhibits, I will mention that the first question
19 to which the Agency responded came from Kara Magyar not
20 as a prefiled question but rather as a public comment.
21 That question will therefore not be made a hearing
22 exhibit and may simply be cited as public comment number
23 1. Is there any objection to designating as a hearing
24 exhibit the prefiled questions of Gail Artrip? Seeing

1 none, that'll be Hearing Exhibit 7. Is there any
2 objection to designating as a hearing exhibit the
3 prefiled questions of the Illinois Environmental
4 Regulatory Group? Seeing none, that will be Hearing
5 Exhibit 8. Finally, is there any objection to
6 designating as a hearing exhibit the prefiled responses
7 of the Agency? Seeing none, that will be Hearing
8 Exhibit 9.

9 At this point we will proceed with the Agency's
10 presentation. I would ask the court reporter to please
11 swear in the Agency's witnesses collectively.

12 (Witnesses sworn.)

13 HEARING OFFICER MCGILL: Thank you. Now I
14 would ask Agency attorney Kimberly Geving to begin the
15 Agency's presentation.

16 MS. GEVING: Good morning. As you stated,
17 my name is Kimberly Geving. I'm assistant counsel for
18 the Bureau of Land. I'll do my best -- I'm sitting right
19 near you, so you can hear me. I'm going to introduce
20 today our panel of witnesses and also Agency staff
21 present here today. To my immediate right is Heather
22 Nifong, programs advisor for the division of remediation
23 management. Next to her is Gary King, acting chief of
24 the Bureau of Land. Next to Gary is Hernando Albarracin,

1 manager of the leaking underground storage tank section.
2 Next to Hernando is Andy Frierdich, project manager in
3 the state sites unit, and next to Andy is Tracey Hurley,
4 an environmental toxicologist. Next to Tracey is Dr. Tom
5 Hornshaw, manager of the toxicity assessment unit, and
6 last but not least is Joyce Munie, manager of the
7 remedial project management section. I will turn it over
8 to them for summaries.

9 HEARING OFFICER MCGILL: Thank you.

10 MR. KING: My name's Gary King. I
11 appreciate the opportunity to present testimony here, and
12 I'm not going to go into length on all of this, but I'll
13 summarize some of the aspects of the proposal. Our
14 proposal really has two major components. One, and I
15 think is the -- been the most significant in terms of
16 development, has been the addition of the indoor
17 inhalation exposure route, and the second part is the
18 updating of the remediation objectives.

19 This is the fourth time we have come before the
20 Board with amendments to TACO since the rule was first
21 adopted in 1997. I testified at that -- those first set
22 of hearings. I didn't have any gray hair at that point.
23 I do now, so -- and I've been involved with each of these
24 rules as we've developed them. The commitment we made

1 back in '96 was that we would continue to update TACO as
2 we gathered further information relative to its
3 implementation and relative to the science that supported
4 it, and that's what we've continued to do and that's what
5 we're doing with the proceeding that we're testifying at
6 today.

7 We're fortunate in terms of the proposal we're
8 making in that when we first set TACO up over a decade
9 ago, we did a -- we set up a rule that was very
10 comprehensive but yet was very flexible in its approach
11 to establishing remediation objectives. The system we
12 have, as I've seen what other states have around the
13 country, I think we have the best system of any state in
14 the country, and I think because of that it's allowed us
15 to come back and add, make changes and build on the
16 system that we already have in place, and that's what
17 we're doing with our proposal that we submitted for this
18 docket.

19 The second thing I think is -- that's been real
20 important relative to TACO -- and again, it's fairly
21 unique among states -- we -- the Illinois statute set up
22 initially a group called the Site Remediation Advisory
23 Committee, and we took our involvement with them very
24 seriously from the start and we've continued to take that

1 very seriously. It's really -- That's a group of the
2 people who are regulated by -- subject to the regulations
3 of TACO, and they have over the years provided us with
4 very exceptional professional input on the things we've
5 proposed, and that's also true of the proposal that we
6 submitted in this proceeding. We ended up -- We started
7 with -- We spent about a year or so developing a
8 proposal. We sent it out to the advisory committee in
9 May of 2007 and requested that they review it and they --
10 and that they transmit it to all the people that they
11 could, you know, find that would be interested in it, and
12 they did that, and they ended up coming back to us with,
13 oh, I don't know, about 125, 130 questions and issues to
14 be addressed, and so we had a series of meetings with
15 them and addressed those issues, and that involvement
16 really resulted in some very significant changes to our
17 proposal.

18 Just to highlight a couple of those, one of them
19 was relative to soil gas corrective action objectives.
20 We have that now in our Tier 1 table, and when we
21 initially went out with the proposal, we didn't have
22 those in there, and one of the comments we got back from
23 the advisory committee is that we really needed to
24 include that, and so we've gone ahead and prepared those

1 type of objectives. Another significant comment we
2 received was relative to building control technologies,
3 that we needed to have a set of defined types of building
4 control technologies, so we went back and included those
5 as well, and then there's a lot of other smaller changes
6 that we made, so that was really -- I think really a key
7 to developing this proposal, and Brian Martin, who is the
8 current chair of the Site Remediation Advisory Committee,
9 was really instrumental in working with us with regards
10 to the development of the proposal.

11 Let me talk about -- a little bit about the
12 proposal itself. Again, we're looking at the -- on the
13 indoor inhalation side, we phrased it that way in the
14 rules. More typically in a colloquial kind of way it's
15 called vapor intrusion, and so if you see it in the press
16 and those kind of things, that's the way it's normally
17 referred to. We call it indoor inhalation just to --
18 because it fits better within the context of our rules,
19 and it also is not quite -- it's not quite as
20 inflammatory a term as vapor intrusion is. And really,
21 this pathway is focused on the movement of contaminants
22 from soil and groundwater through soil gas and then into
23 building interiors, where it can create health risks when
24 occupants breathe that contaminated air. We have

1 included 59 chemicals of concern that we have identified
2 should be subject to this exposure route. Those are
3 listed in the proposal.

4 Management of the indoor inhalation route is
5 going to be similar to what we have in the other pathways
6 of TACO. Again, as I said before, it's really building
7 upon it. We've got a three-tiered approach, a Tier 1
8 with a table of numbers that can screen compounds out or
9 not; there's a set of Tier 2 equations that are put in
10 the rules; and then finally there's Tier 3 that kind of
11 deals with situations that fall outside of Tier 1 and
12 Tier 2. We have included opportunities for pathway
13 exclusion, as we have done with the other pathways, and
14 we've included, as I was describing before, building
15 control technologies, which is somewhat similar to the
16 concept of engineering barriers that we had relative to
17 the other pathways.

18 Included with my testimony are some case studies,
19 and that's -- that was from seven different sites, and
20 the reason why we put those together, it's not that those
21 are the only things we've encountered, but we wanted to
22 give kind of a flavor of the fact that this issue
23 relative to indoor inhalation is something that needs to
24 be addressed across all of the programs that Illinois EPA

1 looks at when they're managing a cleanup site, and it
2 really shows the kind of variety of those types of sites
3 and shows the different types that are encountered and
4 really shows the need for having a consistent methodology
5 for how you address indoor inhalation, which is what we
6 are proposing in this rule.

7 We think this is going to have three important
8 benefits for the state and for the residents of the
9 state. First there's going to be -- this methodology
10 will create a better way of protecting Illinois residents
11 from volatile chemicals migrating into -- from
12 contaminated soil and groundwater into their homes or
13 places of business. Secondly, site owners and other
14 remediation applicants will have a more expanded
15 liability relief through issuance of a no further
16 remediation letter that covers this pathway. And then
17 finally, we think that this -- having these remediation
18 objectives will facilitate property transactions.

19 In March of last year, ASTM issued a standard
20 practice document for assessment of vapor intrusion into
21 structures relative to real estate transactions. As part
22 of that practice document, they instruct users to apply
23 state generic risk-based concentrations as they're going
24 through the process of using the ASTM standard. We think

1 that what we're doing here really is part of helping
2 assist that process along.

3 Rather than go through the details, I think the
4 details of the proposal are kind of spelled out. We'll
5 kind of talk about those further as we discuss some of
6 the questions and responses to them. I wanted to talk
7 briefly about -- we submitted a couple of errata with
8 our -- subsequent to our proposal. Errata 1 proposes
9 removing a subsection, 742.1210(c)(4). That section
10 contains a building control technology requirement for a
11 barrier made of geologic materials. As I put together in
12 my testimony after -- we initially had that included, but
13 as we went through the process of our developing our
14 proposal and developing the other building control
15 technologies, we realized that that (c)(4) provision
16 really didn't make sense to be included based on the way
17 the equations worked, so we are proposing that that be
18 dropped. The second errata --

19 HEARING OFFICER MCGILL: I'm sorry. Could I
20 just interrupt you for one sec? I want to make sure I'm
21 looking at the right errata sheet. You said that was in
22 errata sheet number 1?

23 MR. RAO: Yes.

24 MR. KING: Yes.

1 HEARING OFFICER MCGILL: Okay. Thank you.

2 MR. KING: Then in errata number 2 we are
3 proposing an addition to Section 742.105(i), and I'll
4 just read it to give it -- give some context here. It
5 says, "A no further remediation determination issued by
6 the Agency under this part addresses the potential of
7 contaminants present in soil, soil gas and groundwater to
8 reach human receptors. It does not evaluate the safety
9 or protectiveness of buildings on or off-site."

10 What we're dealing with in that issue is the fact
11 that buildings can have volatile chemicals within them,
12 okay, and the fact that a -- the groundwater or the soil
13 on a site meets the criteria of the rules doesn't mean
14 that any existing building necessarily is safe, so we
15 wanted to make it clear that what we're focusing on here
16 is not contamination within a building but contamination
17 that can move from contaminated soil or groundwater into
18 a building, and, you know, that -- and we -- the
19 importance of that was identified -- just recently I saw
20 a report out of Maryland where they actually had PCE
21 which from a dry-cleaner site had gone into the drywall
22 of the building, and then as the site changed usage, the
23 PCE was coming off into the air within the structure.
24 So, I mean, it's -- like I said, it's important to

1 recognize that we're not talking about using TACO to
2 determine whether the environment within the building has
3 been made safe from things within the building. That's
4 the purpose of errata 2.

5 The final thing I wanted to address as part of my
6 opening testimony, one of the questions that we received
7 from IERG -- if you want to just refer to it, it's
8 question 8 -- and we presented an answer in our prefiled
9 responses, but I had a conversation with Mr. Martin last
10 week, who indicated he thought that that response was
11 incomplete and was too generalized and needed to have a
12 little more specification, so I prepared a response
13 that's a little bit different from the answer that we
14 have in the prefiled question, and I can just read that
15 into the record or we can submit that, however --

16 HEARING OFFICER MCGILL: That would be fine
17 if you want to just go ahead and read it.

18 MR. KING: Okay.

19 HEARING OFFICER MCGILL: Is this replacing
20 your prior answer or supplementing it?

21 MR. KING: Yes, this would be replacing the
22 prior answer. Do you want me to read the question as
23 well?

24 HEARING OFFICER MCGILL: That might be

1 helpful for those who haven't read the question.

2 MR. KING: Okay. This is question 8, and
3 the question is as follows: "If there is a well at the
4 property boundary and it exceeds the remediation
5 objectives for the vapor intrusion groundwater pathway,
6 will the site still qualify for an NFR letter? For
7 example, the remediation site might not have any
8 buildings and indoor inhalation ROs might not apply, but
9 presumably the groundwater (and exceedance) might go
10 off-site." Okay. And the answer is as follows: "Yes,
11 if the site meets the soil gas remediation objectives at
12 the property boundary and no other pathways are a
13 concern. If soil gas concentrations exceed remediation
14 objectives, the site evaluator must investigate
15 off-site."

16 Just as an aside, that's similar to what we had
17 before in the answer. Here's kind of the difference
18 where we broke it out into the LUST program and site
19 remediation program. "Under the LUST program, if
20 contamination is identified off-site, the site evaluator
21 must either clean up the contamination or negotiate an
22 ELUC." That's capital E, capital L, capital U, capital
23 C. "Under the site remediation program, the site
24 evaluator need only actively remediate the on-site

1 contamination to qualify for an NFR letter. The NFR
2 letter issued by the site remediation program will not,
3 however, release the site from any off-site liability.
4 For both programs, the absence of any buildings, on-site
5 or off-site, does not matter when performing the site
6 investigation."

7 That concludes my presentation.

8 HEARING OFFICER MCGILL: Thank you.

9 MS. GEVING: Ms. Hurley, if you'd like to
10 proceed with your summary, please.

11 MS. HURLEY: Okay. My name is Tracey
12 Hurley. My testimony concerns the updates to the
13 appendices, errata sheet number 1 and errata sheet number
14 2. We have four primary reasons for the updates to the
15 appendices. One is we've calculated new remediation
16 objectives for the indoor inhalation route, and we have
17 added a new associated table with the Tier 1 remediation
18 objective, and we have also added a new table with the
19 Johnson and Ettinger equations, and we have added a new
20 table with the parameters that were used in the Johnson
21 and Ettinger equations and the default values for these
22 parameters, and in the appendices we have also updated
23 the remediation objectives for the other pathways, and
24 this was due to updates in the toxicity criteria and

1 updates in the chemical and physical parameter values,
2 and we have also added new chemicals from the proposed
3 groundwater standards.

4 Errata sheet 1 corrects errors in the tables, and
5 errata sheet 2, we are proposing a change in
6 Section 742.227, and this is in response to a prefiled
7 question that we received from IERG, question number 13.
8 When we were preparing our response, we realized that the
9 rules weren't clear that Section 742.227 does not apply
10 to sub-slab soil gas samples, so we are adding language
11 to clarify this. Do you want me to read the language?

12 HEARING OFFICER MCGILL: This is in the
13 current errata sheet number 2?

14 MS. HURLEY: Yes.

15 HEARING OFFICER MCGILL: Okay. Sure, if
16 you'd like to.

17 MS. HURLEY: Okay. At the end of the
18 opening paragraph to Section 742.227, we are adding the
19 following sentence: "Proposals to use sub-slab soil gas
20 data shall follow Section 742.935(b)."

21 Also in errata sheet number 2, in Appendix A,
22 Table L, we are changing the Csat value for the chemical
23 m-Xylene. We are changing the value from 1.50E+00 to
24 1.50E+02, and this is correcting a typographical error in

1 the value. In Appendix B, Table A, for the chemical
2 1,4-Dichlorobenzene, also known as p-Dichlorobenzene, we
3 are changing the ingestion value from 120 with a footnote
4 of "e" to 5,500 with a "b" footnote, and we are changing
5 the outdoor inhalation value from 3.3 with an "e"
6 footnote to 12,000 with a "b" footnote, and this was in
7 my prefiled testimony on errata 1. It was actually
8 supposed to be in errata sheet 1 but was inadvertently
9 omitted from the actual filed copy of errata sheet 1.
10 And the last change on errata 2 is in Appendix C, Table
11 M. For the symbol Qsoil in the column entitled "Source,"
12 we are deleting the references to Part 742.505(a) (2) (D)
13 and Part 742.505(b) (5), and these sections refer to an
14 old draft version of the TACO rules and these sections no
15 longer exist in the current proposal. And that concludes
16 my summary.

17 HEARING OFFICER MCGILL: Thank you.

18 MS. GEVING: Dr. Hornshaw, if you'd like to
19 proceed.

20 DR. HORNSHAW: Yes. My name is Tom
21 Hornshaw, and I'm the manager of the toxicity assessment
22 unit. In contrast to the prior hearings for TACO, my
23 testimony is limited to one small portion of errata sheet
24 1 dealing with the area background determination for

1 groundwater, and the reason for this is that a problem
2 that became apparent in a legal case that we're involved
3 with in which the responsible party is using the current
4 prescriptive approach for determining area background,
5 which is Section 742.410(b)(1), which specifies that if a
6 data set contains ten samples, is normally distributed
7 and has no more than 15 percent non-detect values, then
8 the responsible party may calculate an upper tolerance
9 limit from that data set using the procedures listed in
10 the prescriptive approach.

11 A problem is -- that occurred is with nitrate
12 determination at this legal case in which this -- the
13 next sample that will complete the ten data sets will
14 result in an upper tolerance limit for nitrate in the
15 range of 50 to 55 milligrams per liter, a concentration
16 that has been shown to cause adverse effects in infants
17 in the past. Realizing this, we looked at the 1999
18 Unified Guidance, which was not available at the time of
19 the original TACO hearing back in 1997. The time -- At
20 that time -- We were using EPA guidance at that time,
21 which gave the way of doing the prescriptive approach
22 which is now outdated. The Unified Guidance specifies
23 many different statistical procedures to be used, which
24 the use of which depends on the characteristics of the

1 individual data set. It is worth noting that upper
2 tolerance limit is not among any of the statistical
3 procedures specified in the new guidance. Therefore, we
4 are recommending to delete the prescriptive approach in
5 Section 410(b)(1) and replace it with a language that
6 specifies statistics appropriate to the data set be used
7 after approval by the Agency. And that concludes my
8 small portion of this proceeding.

9 HEARING OFFICER MCGILL: Just a quick
10 follow-up. You referred to the Unified Guidance. Could
11 you just elaborate on -- describe that? What is that
12 referring to?

13 DR. HORNSHAW: It's -- The actual title is
14 "Statistical Analysis of Groundwater Monitoring Data at
15 RCRA Facilities-Unified Guidance," USEPA, Office of Solid
16 Waste, 1999c, which is in progress, and I've been told
17 that it has not been finalized as of this point.

18 HEARING OFFICER MCGILL: Thank you.

19 MS. GEVING: Are you going to need a copy of
20 that document?

21 HEARING OFFICER MCGILL: No. Thank you.

22 MS. GEVING: Well, at this time, that
23 concludes the Agency's summaries until Dr. Salhotra
24 arrives, so if you want to open it up for follow-up

1 questions.

2 HEARING OFFICER MCGILL: Why don't we go off
3 the record for a moment.

4 (Discussion held off the record.)

5 HEARING OFFICER MCGILL: At this point in
6 time we're going to open it up for questions of the
7 Agency's witnesses. If you are a member of the public
8 and have a question, I would ask that you signal me, and
9 after I acknowledge you, if you would state your name
10 and, if applicable, your title and any organization
11 you're representing here today. The Board does have some
12 questions, but I understand that the Illinois
13 Environmental Regulatory Group also has some questions,
14 so we're going to let IERG lead with its questions.

15 MR. DAVIS: Thank you. My name's Alec
16 Davis. I'm here on behalf of the Illinois Environmental
17 Regulatory Group, or IERG. I want to thank you for the
18 opportunity to participate. With me today is Brian
19 Martin, who's an IERG member and is also, as Gary King
20 mentioned, the chairman of the Site Remediation Advisory
21 Committee. Also with me is Deirdre Hirner -- she's
22 executive director of IERG -- and Monica Rios with the
23 law firm of Hodge Dwyer Zeman, who's here on behalf of
24 IERG as well.

1 I'm just going to go through, I think, our
2 questions in order as they're presented in the
3 follow-ups. I just wanted to develop a few of our
4 questions a little more fully so that we really have an
5 understanding of what we're facing here, and I will begin
6 with questions 2 and 3. That will be on pages 6 and 7 of
7 the prefiled answer document.

8 HEARING OFFICER MCGILL: And just for the
9 record, that is Hearing -- now Hearing Exhibit 8?

10 MR. DAVIS: Okay.

11 HEARING OFFICER MCGILL: You're referring to
12 the prefiled questions of IERG?

13 MR. DAVIS: No, this was the prefiled
14 answers.

15 HEARING OFFICER MCGILL: You're referring to
16 the responses?

17 MR. DAVIS: Right.

18 HEARING OFFICER MCGILL: The Agency
19 responses?

20 MR. DAVIS: The Agency responses contain the
21 questions as well.

22 HEARING OFFICER MCGILL: Okay. So that's
23 Exhibit 9, I believe, Hearing Exhibit 9. Thank you.

24 MR. DAVIS: In questions 2 and 3, IERG asked

1 the Agency to provide some information regarding the
2 contents of NFR letters -- that would be no further
3 remediation letters -- in various circumstances, and I
4 wanted to ask a few questions to kind of broaden the
5 circumstances a little bit. Our questions focused mostly
6 on things like the location of buildings, which your
7 answers indicated did not -- were not taken into account.
8 However, I want to ask whether your response --
9 specifically looking at 2, your response to 2b and c on
10 page 7, I wanted to know, would your answer change if
11 there was not contamination underlying an existing
12 building on a portion of a site?

13 HEARING OFFICER MCGILL: Would it be all
14 right if you just go ahead and restate the question?
15 That might help others who haven't read this already and
16 also refresh our memory.

17 MR. DAVIS: Question 2 asks, "Can the Agency
18 provide draft language that will be included in no
19 further remediation letter under the following
20 circumstances," and "b" and "c" is where there's no
21 building on-site and "c" is where there's no building on
22 the site when an NFR letter is issued but there's a
23 likelihood of construction of a building on a known
24 location in the future or an unknown location, and their

1 response was that "b and c are the same purposes -- are
2 the same for purposes of an NFR letter. Illinois EPA
3 intends for the entire site to be safe for current and
4 future building occupants regardless of where those
5 buildings are located." And so my question is whether or
6 not the location of contaminants relative to a building
7 location makes a difference in the response. Would an
8 NFR letter be appropriate given a building location that
9 is not overlying the contaminated portion of the site?

10 MR. KING: I mean, there still would be
11 institutional control on the property. I guess I'm a
12 little -- Maybe if you phrased the question as a
13 hypothetical.

14 MR. DAVIS: I can do that, certainly. If
15 you had a site where, you know, you had -- we'll just
16 say, you know, the north half of the site was not
17 contaminated, the south half of the site was
18 contaminated, would an NFR letter -- could an NFR letter
19 be issued that would, you know, require an institutional
20 control over the south half and, you know, either allow
21 for buildings or if there was an existing building on the
22 north half, would that be permissible?

23 MR. KING: Yes, I think that's correct.

24 MR. DAVIS: Okay. I just wanted to clarify

1 that.

2 MR. KING: Just as long as it -- again,
3 it's -- what's critical to that hypothetical is the area
4 of contamination be identified.

5 MR. DAVIS: Okay. And just generally, on
6 NFR letters that are going to be issued under this new
7 regime with inhalation exposure route, will those letters
8 when they're issued explicitly refer to the fact that the
9 indoor inhalation route has been evaluated or some other
10 instance just to set them apart from previously issued no
11 further remediation letters?

12 MR. KING: At this point we weren't planning
13 on making that kind of separation. I mean, it would
14 just -- it would be -- the way we have things set up is
15 once the rules go into effect, a site has to end up
16 addressing all of the pathways, including indoor
17 inhalation, so it's just to be -- presumed to be the
18 case.

19 MR. DAVIS: Okay. Moving on, then, from
20 that --

21 BOARD MEMBER JOHNSON: Wait a second, Alec.
22 I mean, if one of your goals is to facilitate property
23 transactions, don't you think the addition of language
24 addressing that specifically in an NFR letter would

1 benefit that?

2 MR. KING: You know, we have put in language
3 at the request of remediation applicants that wanted
4 specific language in there. I think we could evaluate
5 that. We just -- We weren't going to set up a procedure
6 where we were mandating that that would apply because we
7 don't do that now and there's multiple pathways, so
8 again, we're just trying to be somewhat similar to the
9 way we've been, but if somebody wants to have that
10 referenced, I think we could accommodate that.

11 MR. DAVIS: Thank you. All right. For
12 question 7, our -- IERG's question 7 is, "Will the Agency
13 require actual data or allow modeling of groundwater to
14 evaluate the vapor intrusion pathway to an off-site
15 building?" My question, I guess, which is relative to
16 this but isn't specifically drafted is, does the indoor
17 inhalation pathway require modeling of the migration of
18 contaminated soil or groundwater?

19 MR. KING: When you say -- Are you just
20 looking at the J&E model or are you looking at R26 or --
21 because those are two separate models, so I'm a little
22 confused by the question.

23 MR. DAVIS: Well, I -- your response
24 referred to R26, but I think if you could describe both,

1 that would be good, just to enhance our understanding and
2 just what it is that is actually required, what modeling
3 is actually required by indoor inhalation.

4 MR. KING: Well, you don't -- I mean, if you
5 found out the extent of contamination -- let's just say
6 we're talking about soil -- you found the extent of
7 contamination and those are -- and that was below -- all
8 below the Tier 1 numbers, then there wouldn't be any
9 modeling required relative to the indoor inhalation
10 pathway. If it was above those screening numbers, then
11 there would be a choice of using the Tier 2 equations
12 with site-specific inputs or Tier 3 or actually
13 monitoring what the soil gas is. If the soil gas
14 demonstrates that the Tier 1 numbers are complied with,
15 again, you wouldn't have to do any -- there would be no
16 modeling required.

17 MR. DAVIS: And would your response be the
18 same for groundwater?

19 MR. KING: Yes.

20 MR. DAVIS: Thank you. And then actually,
21 my last point that I wanted to make is just going back to
22 your testimony. This isn't based on prefiled questions.
23 On page 4 of your testimony you describe averaging, and
24 that was in the averaging of sample results for soil gas

1 samples, if I recall correctly, and I just wanted to ask
2 whether the Agency remains willing to evaluate an
3 averaging methodology if IERG or SRAC was to provide you
4 with some language that was felt to address the issues
5 that you outlined in your testimony here.

6 MR. KING: Yes, as long as it's done soon
7 enough before we're done with the whole process so
8 it's --

9 MR. DAVIS: No, I realize that -- the timing
10 constraints. I just --

11 MR. KING: Yeah. Well, we're definitely --
12 we're open to evaluate an averaging approach or, as
13 outlined in my testimony, kind of the issues that we
14 think are appropriate to think about in developing an
15 averaging approach.

16 MR. DAVIS: All right. Thank you. That's
17 all I've got.

18 HEARING OFFICER MCGILL: Thank you. At this
19 point I wanted to see if anyone else in the audience has
20 any questions for the Agency's witnesses. Sir, again, if
21 you could just state your name and any organization
22 you're representing.

23 MR. REOTT: Raymond Reott. I wonder if I
24 could pull my chair up so you don't have to turn.

1 HEARING OFFICER MCGILL: Sure.

2 MR. REOTT: It's awkward to speak to the
3 back of people's heads. A couple of questions for the
4 panel. As I understand it, like any other pathway, this
5 new pathway would apply to every piece of real estate in
6 Illinois regardless of whether it currently has a
7 structure on it. Is that right?

8 MR. KING: That's correct, for -- as long as
9 they're going through our programs, we're addressing
10 them.

11 MR. REOTT: All right. There were -- seemed
12 to be a couple assumptions that need to be made to make
13 them all work in Illinois. I know that at least on some
14 of those, like temperature, you made an Illinois-specific
15 adjustment to the Johnson and Ettinger model to reflect
16 Illinois' condition. Did you make any other adjustments
17 to reflect Illinois-specific factors?

18 MR. KING: That's a good question, and I
19 didn't spend any time in my testimony talking about it.
20 One of the complexities to developing this rule was
21 because there are various things that needed to be
22 thought through to develop remediation objectives that
23 were different than what we had for the other pathways.
24 One of them, for instance, is building parameters. We

1 had to make a decision on what size building is going to
2 be assumed for purposes of developing the Tier 1 numbers.
3 You have to pick a building size. I mean, that's just
4 the way it works, and we did, and that's reflected in the
5 appendices in terms of the -- it's in -- I'll tell you
6 where it's at. It's Appendix C, Table M, which is the
7 parameters. So we had to develop -- reach some
8 conclusions as to factors such as the building size. We
9 used an Illinois-specific temperature, as you noted, as
10 opposed to using the number that was used by USEPA. They
11 used a 25 degree C number, and we thought that was way
12 too conservative for the circumstances in Illinois. So,
13 I mean, it really -- if you look through the -- through
14 that Table M, there's a few items that we had to reach
15 conclusions on, and I think those are pretty well
16 identified.

17 MR. REOTT: On the building size -- I don't
18 know if I saw over there -- what did you assume on the
19 building size?

20 MR. KING: The building size for residential
21 was -- it was assumed to be 10 meters by 10 meters as
22 a -- you know, as a residential size, so I'm trying to --
23 it's about 1,000 square feet, I guess, if I'm thinking
24 that through properly, so you can see what kind of

1 building size we're talking about as far as a residence.

2 MR. REOTT: And in the commercial/industrial
3 setting?

4 MR. KING: We doubled the length of the
5 building, so it became 20 meters by 20 meters. And
6 again, you know, we could have picked a smaller size or a
7 bigger size, but we had to pick something that we felt
8 was going to be reasonable as a suitably conservative
9 approach.

10 MR. REOTT: You also, it appears, made an
11 assumption about the geologic material that would exist
12 between the contaminated media and the building, and I
13 think, if I remember correctly, you chose sand as your
14 default value; is that correct?

15 MR. KING: That's correct.

16 MR. REOTT: Did anyone consult with the
17 state geologist about whether that was an appropriate,
18 you know, assumption given Illinois' thicker geology?

19 MR. KING: Well, that -- one of the things
20 that we tried to do as we were developing the parameters
21 to use with the J&E model is we always went back and
22 looked at what did we do under TACO as it always stood,
23 okay, and we used sand as the default condition under the
24 existing TACO rule, so that's what we used here.

1 MR. REOTT: This is more of a science
2 question, so maybe it's not you, but do any of the
3 science people -- maybe it's a question for your later
4 witness. Do you think that that assumption would affect
5 the parameters a little differently in a vapor context as
6 opposed to the original TACO context?

7 MR. KING: Well, it's -- it definitely
8 affects the values that are calculated, but again, we
9 were -- we wanted to have a -- again, as I said, build on
10 what we had before in TACO and have something that
11 continues to be a reasonably conservative approach.

12 MR. REOTT: What about the depth to the
13 contaminated media? What did you assume there?

14 MR. KING: I think -- The parameter --
15 again, this is still in that Table M -- is Dsource,
16 distance from the ground surface to top of contamination,
17 and for soil it's 152 centimeters, which how many feet is
18 that?

19 MR. FRIERDICH: Almost five feet.

20 MR. KING: Which is about five feet. You
21 know, it's just -- just got to work with the metric
22 system, so, I mean, it's just -- it's all still too old,
23 can't -- it's hard to visualize the metric stuff. And
24 then the groundwater contamination, it's 304.8

1 centimeters, which is about ten feet.

2 MR. REOTT: Are those factors that can be
3 varied in a Tier 2 type analysis --

4 MR. KING: Well, they --

5 MR. REOTT: -- to show that -- in your
6 site-specific conditions that that contaminant be used
7 different?

8 MR. KING: They could, but they're the
9 least -- they're -- they have very little sensitivity in
10 the model, because the model's assuming an infinite
11 source, so it -- whether it's deeper or not as deep, you
12 know, it doesn't vary that, doesn't have that much of an
13 impact.

14 MR. REOTT: If you end up in a Tier 2
15 analysis, what factors did you find had the most
16 sensitivity?

17 MR. KING: The biggest one is -- let me find
18 it here -- is theta w, which is described as water-filled
19 soil porosity. That has the biggest impact, and then the
20 next one is FOC, which is --

21 MR. REOTT: Fraction organic?

22 MR. KING: -- fraction organic carbon
23 content.

24 MR. REOTT: So that would basically be

1 challenging whether it's really sand or not.

2 MR. KING: Yes.

3 MR. REOTT: Okay. Was any attempt made
4 based upon those seven case studies that you had talked
5 about in your testimony to try to correlate actual indoor
6 air quality readings in the field with the predicted
7 values under the Johnson and Ettinger model?

8 MR. KING: The simple answer is no.

9 MR. REOTT: It seems that one of the -- or
10 two of the primary impacted populations by this rule
11 change is going to be the LUST fund and the City of
12 Chicago, the LUST fund because of the number of sites
13 that could potentially be affected. Has anybody done a
14 financial calculation to see the impact of this on the
15 LUST fund?

16 MR. KING: No, we have not done that. I
17 mean, part of that too again, what we're seeing as far as
18 remediation costs is that the petroleum contaminants are
19 not as significant of a problem as the chlorinated
20 compounds, so how much actual impact there would be
21 relative to tank sites in terms of actual remediation is
22 not quite clear at this point.

23 MR. REOTT: Did the Agency do any tables
24 that directly compare for the 59 chemicals the

1 preexisting TACO pathway values and the proposed values?
2 Because you have separate tables now in the way the
3 rule's written. Just to keep someone from having to
4 reconstruct this, did you guys internally do anything in
5 a more -- in an easy-to-compare formula show the new
6 projected values for indoor inhalation versus the
7 existing TACO values for the same 59 chemicals?

8 MR. KING: Yeah, that was one of the things
9 we kind of struggled with. We wanted to put it all in
10 the same set of tables just for making that kind of
11 comparison you're talking about easier to do, but it
12 just, you know --

13 MR. REOTT: Print ends up so small you can't
14 read it.

15 MR. KING: Yeah. You know, you can't -- and
16 you get to a point -- I mean, we've got footnotes on
17 those tables, and those footnotes are important, and all
18 of a sudden you take them apart and you can't even -- you
19 can't read what the footnote is, so we chose to use a
20 separate table, and we did do some comparison, and in
21 some situations they're more conservative than what's
22 existing now and then in other situations they're not.
23 Where the groundwater ingestion pathway that's still --
24 that's in the older set of rules is still -- has not been

1 excluded or that's not been excluded, that is generally
2 still going to be the driving pathway.

3 MR. REOTT: The most restrictive criteria.

4 MR. KING: Right, the most restrictive
5 criteria. Where that has been excluded, okay, then a lot
6 of the time the indoor inhalation pathway will become the
7 most restrictive for volatile chemicals.

8 MR. REOTT: So for volatile chemicals at
9 sites in the city of Chicago or other communities with
10 groundwater ordinances, the indoor inhalation pathway
11 will turn out to be the most restrictive pathway, then.

12 MR. KING: I think that's -- that is going
13 to turn out to be true.

14 MR. REOTT: So particularly for those
15 populations, you know, people with sites in those kind of
16 communities, Chicago and other communities with
17 groundwater ordinances, then there's something
18 substantial at stake here, you know, in this change.
19 This is not a minor change to the rule. It's a pretty
20 big change.

21 MR. KING: No, it is a significant change,
22 and that was one of the things we earlier identified for
23 people, is that the groundwater ordinance institutional
24 control would not apply for this pathway, and so there --

1 it is something that additionally will be -- will need to
2 be addressed.

3 MR. REOTT: There's a couple of points in
4 the testimony where different witnesses describe
5 different issues with trying to measure indoor air
6 quality and use indoor air testing to evaluate compliance
7 with an indoor inhalation pathway and point out obvious
8 problems with indoor air testing. It seemed as if most
9 of those problems resulted in false positives in a sense
10 that, you know, if the person in the home is using some
11 volatile chemical, it will result in a positive in the
12 sense that it will show that chemical in the air in the
13 house or building but it didn't necessarily come from the
14 soil or groundwater. If you have indoor air results that
15 are negative, so in other words they show the chemicals
16 are not present, why wouldn't those still trump the other
17 predicted modeling sources for what the indoor air
18 quality would be?

19 MR. KING: Under Tier 3 that would be an
20 option, but it's still -- you'd still have to address the
21 source of the contamination. I mean, it -- you could go
22 into a building and find negative values, but, you know,
23 where is that building in the context of the
24 contamination? There has to be a correspondence between

1 where the contaminants are and where the building's at.
2 It would be -- That would be a potential way to approach
3 things, but again, as you were commenting, the danger of
4 false positives and the intrusive nature of that kind of
5 sampling, particularly when you're talking about
6 residences, we just thought it was a more sound approach
7 to look at the contamination at the site without having
8 that -- you know, the indoor aspect as a -- as its own
9 tier.

10 MR. REOTT: So at least in a Tier 3 type
11 evaluation, the Agency would consider that approach?

12 MR. KING: Yeah, we could consider it. I
13 wouldn't advise it, I mean, just because of the -- I
14 think that would be kind of a last resort kind of an
15 approach given the other flexibilities we've included in
16 the rules.

17 MR. REOTT: That's it. Thank you.

18 HEARING OFFICER MCGILL: Mr. Reott, if
19 you -- are you just here on your own behalf or
20 representing an organization today?

21 MR. REOTT: I --

22 HEARING OFFICER MCGILL: On your own behalf
23 is fine. I just --

24 MR. REOTT: I'm here -- I testified three

1 times in the original TACO rulemaking --

2 HEARING OFFICER MCGILL: Yeah, we recall.

3 MR. REOTT: -- for those of you who were
4 around for that, was one of the two people who opposed
5 the original Agency proposal in that rulemaking, which
6 the Board substantially changed, and I just think that --

7 HEARING OFFICER MCGILL: And before you
8 proceed, I -- we certainly would be happy to swear you in
9 if you would like to provide some testimony.

10 MR. REOTT: No. I may well do that in
11 March.

12 HEARING OFFICER MCGILL: Okay. Fair enough.

13 MR. REOTT: Today was more informational
14 gathering about the nature of the Agency's proposal, try
15 to flush out a couple of parameters. This is really
16 important. This is going to affect a lot of sites, and,
17 you know, I think I'll probably elaborate on that in
18 March, but, you know, this needs to be looked at very
19 carefully.

20 HEARING OFFICER MCGILL: Thank you. We look
21 forward to hearing from you.

22 MR. KING: Could we make one other addition?
23 Dr. Hornshaw wanted to make one other addition.

24 HEARING OFFICER MCGILL: Sure. We're still

1 on the record. Go ahead.

2 DR. HORNSHAW: Just wanted to point out that
3 in addition to the potential problem of false positives,
4 there's also a problem -- a potential problem for false
5 negatives. You can pump up the ventilation, open the
6 window, etc., to help defeat the actual results that
7 might be truly there.

8 HEARING OFFICER MCGILL: Thank you. I'll
9 ask again if anyone in the audience has any questions for
10 the Agency's witnesses. Seeing none, why don't we go off
11 the record for a moment.

12 (Discussion held off the record.)

13 HEARING OFFICER MCGILL: The Board -- Seeing
14 at this point there were no other questions from the
15 audience, the Board was going to pose its questions,
16 after which if Dr. Salhotra hasn't shown up yet, we'll
17 probably break for lunch.

18 MS. GEVING: Okay.

19 MR. RAO: We'll just go section by section
20 and start with the definitions. Mr. King, in the
21 definition of a building, could you please explain the
22 rationale for choosing six months as a time frame for
23 minimum occupancy?

24 MR. KING: Well, we were -- we knew we had

1 to have something longer than a day, you know, so it --
2 we just -- this is one of those discussions we had with
3 the Site Remediation Advisory Committee in terms of
4 trying to come up with something that would be, you know,
5 a reasonable time frame that would indicate that there
6 was a permanency to the structure, you know, so in
7 essence, if you had a -- you know, Larry Estep, who is
8 with -- on behalf of Site Remediation Advisory Committee,
9 he wanted to make sure that his chili tents that he set
10 up for chili cook-offs weren't going to be considered
11 buildings, you know, and so we kind of had to make sure
12 that tent structures set up for a short period of time
13 were not buildings, so it was kind of like -- had to
14 reach the conclusion as to what represented a permanent
15 structure, and so we just -- we came up with six months
16 as that kind of designation.

17 MR. RAO: So if somebody has a summer rental
18 and occupies it for three months, that --

19 MR. KING: Well, if the building -- excuse
20 me. Yeah, if it's intended for or supports any human
21 occupancy for more than six consecutive months, I guess
22 we'd be in a close call there, because that's something
23 that's intended for -- you know, could be intended for
24 occupancy for more than six months. I mean, it's --

1 we're kind of trying to look at the building itself.

2 MR. RAO: Okay.

3 HEARING OFFICER MCGILL: I had a question.

4 The definition of residential property is not -- the
5 Agency proposal does not seek to amend it, but I've got a
6 couple questions on that definition and whether or not it
7 needs to be amended to take into account the new indoor
8 inhalation pathway. I think because you included the
9 definition section, most of you probably have the
10 definition in front of you, but I'm going to read it just
11 quickly from Section 742.200. Residential property is
12 defined as any real property that is used for habitation
13 by individuals or where children have the opportunity for
14 exposure to contaminants through soil ingestion or
15 inhalation at educational facilities, health care
16 facilities, child care facilities or outdoor recreational
17 areas, and my question is, should the definition of
18 residential property be amended so that the Tier 1
19 residential indoor inhalation remediation objectives
20 clearly would apply to, for example, where children have
21 the opportunity for exposure to contaminants through
22 indoor inhalation at educational facilities, health care
23 facilities, child care facilities or conceivably indoor
24 recreational areas?

1 MR. KING: So you're looking at -- it says
2 soil ingestion or inhalation, and then you're looking at
3 how those modifiers are working there.

4 HEARING OFFICER MCGILL: Well, right.
5 There's the -- well, several things. There's -- And you
6 know the history of this provision probably as well as
7 anyone back in '97. In R97-11 and R97-12 there was a lot
8 of attention paid to this language, so, yeah, I think
9 there's a question of whether soil ingestion or
10 inhalation would cover indoor volatilization and then
11 also the reference to outdoor recreational areas. At the
12 time of the original TACO rulemaking, indoor recreational
13 areas were specifically mentioned in the Board opinion as
14 not being included, so I just was wondering if you guys
15 revisited that definition in light of this proposal.

16 MR. KING: No, we did not, but I -- in
17 looking at the definition in the context of the questions
18 you've raised, I think we certainly will go back and look
19 at this and consider submitting an additional errata on
20 this point to clarify it.

21 HEARING OFFICER MCGILL: Thank you. And
22 if -- while you're looking at that, if you could also --
23 I'm sure you'll be looking at R97-11 and 12, where there
24 was a lot of discussion and Agency-proposed language. At

1 that time the -- there was an Agency proposal and the
2 Board agreed to reference children specifically as
3 opposed to persons, and there was a rationale for that, I
4 think, at that time, and I'm just wondering if -- should
5 that still be limited to children or should it be more
6 broadly persons?

7 MR. KING: We'll look at both the children
8 concept there and then the inhalation.

9 HEARING OFFICER MCGILL: Yeah, with -- I'm
10 not trying to revisit decided issues or things that are
11 already reflected here, but in terms of the indoor
12 inhalation pathway in particular, since we're adding it,
13 and residential property definition is such a
14 touchstone --

15 MR. KING: Right.

16 HEARING OFFICER MCGILL: -- for this and for
17 Part 740, I'd appreciate you guys taking a close look at
18 that and getting back to us.

19 MR. KING: Okay. We will.

20 HEARING OFFICER MCGILL: Thank you.

21 MR. RAO: Mr. King, the definition of soil
22 gas, I think the proposed definition states that it means
23 air existing in void spaces in the soil between the
24 groundwater table and the ground surface. Groundwater

1 table is a well understood, you know, term in the field.
2 My question was, should we put that definition of
3 groundwater table in the rule just to make sure anyone
4 reading the rule will clearly know what it means?

5 MR. KING: You know, I -- I'm looking -- I'm
6 getting these looks on this. We had -- I -- We had
7 considered putting that in there. We found that once we
8 started trying to look at it in different programs and
9 site-by-site issues that it was going to be really
10 difficult to have a single definition, but we can go back
11 and think about that again.

12 MR. RAO: Yeah, I thought that may be one of
13 the reasons for not putting it in, but sometimes we get
14 these requests from JCAR, so I was thinking it had better
15 come from you guys than we coming up with a definition
16 really late in the rulemaking, so I'd appreciate it if
17 you take a look at that.

18 MR. KING: Okay. Thank you.

19 MS. LIU: Miss Hurley, hi. Good morning.
20 On page 7 of your prefiled testimony you explained that a
21 volatile chemical is defined in a new way, differently
22 from a VOC. The previous definition references to the
23 vapor pressure as well as the boiling point, but the new
24 definition of volatile chemical doesn't include a

1 reference or a limitation on boiling point, and I was
2 wondering if you could explain why.

3 MS. HURLEY: We looked at several different
4 physical chemicals of the property -- physical chemical
5 properties of the chemicals, and boiling point did not
6 really correlate very well with whether a chemical was
7 analyzed as a volatile or semi-volatile, and we wanted to
8 consolidate the two definitions of volatile chemical that
9 we had in the rules, so we decided to drop boiling point
10 from the definition.

11 MS. LIU: Also referring to those same two
12 definitions side by side, there is a difference in the
13 temperature referenced. One was 25 degrees celsius and
14 the other was 20 degrees celsius. Was the reason for
15 that change to approach Illinois-specific factors or
16 indoor air temperature more closely, or was there another
17 reason?

18 MS. HURLEY: We changed the current
19 definition to 25 degrees from 20 degrees because most of
20 the data is collected at 25 degrees C as opposed to 20
21 degrees C.

22 MS. LIU: Thank you.

23 HEARING OFFICER MCGILL: Ms. Hurley, this is
24 just sort of a housekeeping question. There -- You

1 had -- There were a number of sources referenced in your
2 prefiled testimony, and we were just hoping that the
3 Agency could provide us with an author, a date, citation,
4 you know, Web address, that sort of thing, so I'm just
5 going to rattle off these sources, and if you guys can
6 just follow up with us on that to provide that
7 information.

8 At page 2 of your prefiled testimony you list
9 sources that were used for the revised physical and
10 chemical parameter values, specifically USEPA's Superfund
11 Chemical Data Matrix, SCDM. Next is CHEMFATE. Next is
12 PhysProp. It's P-H-Y-S, one word, capital P-R-O-P. The
13 next is USEPA's Water, the number 9, software. Next is
14 the Handbook of Environmental Degradation Rates. And
15 then on page 3 of your prefiled testimony you refer to
16 USEPA's Provisional Pier Reviews Toxicity Values, or
17 PPRTVs. Next, USEPA's HEAST -- that's all caps,
18 H-E-A-S-T -- and then the California EPA's toxicity
19 values. And last, on page 18 you refer to the
20 recommended exposure limit, REL, established by the
21 National Institute for Occupational Safety and Health.
22 If you could provide that additional information so we
23 can identify those sources, we would appreciate it, and
24 I'll ask that Kim Geving can take a look at whether any

1 of those need to be added to your list of studies and
2 reports used in regulatory development. That's
3 Section 102.202(e) of the Board's procedural rules. And
4 last, the Agency proposal that we received doesn't seem
5 to have a hard copy of an ASTM, so I wanted to give you
6 that identification and then if you could provide a hard
7 copy. It's ASTM D1946-90.

8 MS. GEVING: It was one of our
9 incorporations that you did not receive? Is that
10 correct?

11 HEARING OFFICER MCGILL: Yes.

12 MS. GEVING: Okay.

13 HEARING OFFICER MCGILL: Thank you.

14 MR. RAO: Mr. King, I had a question on
15 Section 742.227, "Demonstration of Compliance with Soil
16 Gas Remediation Objectives." This is in subsection (d).
17 The proposed language states that soil gas remediation
18 objectives shall be compared to concentrations of soil
19 gas collected at a depth at least three feet below ground
20 surface and above the saturated zone. First question is,
21 does saturated zone mean groundwater table in this
22 context?

23 MR. KING: It means the top of the capillary
24 fringe, is what we are talking about.

1 MR. RAO: Okay. So it's not the same as --
2 groundwater table as soil gas is defined, I guess.

3 MR. KING: Hang on just a second.

4 MR. RAO: Yeah.

5 HEARING OFFICER MCGILL: We can go off the
6 record for a moment if you like.

7 MR. KING: Can we -- Why don't we -- We'll
8 come back to you after lunch on that one.

9 MR. RAO: Yes. Okay.

10 HEARING OFFICER MCGILL: Why don't we go off
11 the record for one moment.

12 (Discussion held off the record.)

13 HEARING OFFICER MCGILL: The Agency has
14 indicated that they will provide an additional response
15 to Anand Rao's question after we take a short break, so
16 why don't we proceed with our next question.

17 MR. RAO: Next question is on
18 Section 742.812. Subsection (b) of this section sets
19 forth that thickness of the capillary fringe layer is 17
20 centimeters, and subsection (c) states that volumetric
21 content of the capillary fringe shall be 90 percent of
22 the total porosity of the soil that comprises the
23 capillary fringe. Mr. King, can you please explain the
24 rationale for, you know, setting the thickness of the

1 capillary fringe and the volumetric water content?

2 MR. KING: We went back and looked at the
3 documents that USEPA used in their initial guidance
4 document and how they derived those numbers, because
5 that's where we're taking those numbers from. We're
6 coming from the USEPA guidance document, and in that
7 document they talked about the difficulty of on a
8 site-by-site basis evaluating and determining those
9 numbers and that really it requires a comprehensive set
10 of studies over a -- you know, over a range of materials
11 to be able to reach some conclusion, so we really kind of
12 tracked how they were approaching the issue and not
13 having really people spend a lot of time trying to figure
14 out something that would be a much larger study than what
15 should be applied on an individual site basis.

16 MR. RAO: Did you look to any
17 Illinois-specific information?

18 MR. KING: No. We just went off the
19 nationwide materials.

20 MR. RAO: Okay. Thank you. Miss Liu just
21 alerted me that -- could you please give us a citation to
22 the USEPA document that you used to get that information?

23 MR. KING: It's in our incorporations by
24 reference. It's just a matter of finding that.

1 MR. RAO: Okay. If you want, you can
2 provide that later.

3 MR. KING: Okay. It's described as the
4 "User's Guide for Evaluating Subsurface Vapor Intrusion
5 into Buildings," February 2004. That's one of our
6 incorporations by reference.

7 HEARING OFFICER MCGILL: While we're talking
8 about incorporations by reference, I was wondering if the
9 Agency could identify in a motion to incorporate Rick
10 Cobb's testimony from the pending R08-18 proceeding. In
11 Ms. Hurley's prefiled testimony there's -- pages 1 and 2
12 reference to the main revisions to the tables and then
13 how Rick Cobb, the Agency provided testimony on the
14 addition of chemicals to the proposed groundwater
15 standards during the Part 620 hearings. It would just be
16 helpful and for the completeness of this rulemaking
17 record if we knew specifically what portions of the
18 R08-18 record you thought were relevant to this
19 proceeding, and you could certainly do that in the form
20 of a motion to incorporate the portions from R08-18 into
21 this rulemaking.

22 MS. GEVING: We'll take a look at that.

23 HEARING OFFICER MCGILL: Thank you.

24 MS. LIU: Miss Hurley, I have another

1 question for you. On page 2 of your prefiled testimony
2 you state that the revised chemical parameter values are
3 the results of updates in the sources that IEPA uses for
4 information, and we were just wondering if you could
5 please clarify whether the Handbook on Environmental
6 Degradation Rates has been updated since it was published
7 in 1991 or if that was the only one that you had.

8 MS. HURLEY: That has not been updated.

9 MS. LIU: Okay. Thank you.

10 MR. RAO: I have one more for you,
11 Miss Hurley. On page 7 of your testimony you state that
12 USEPA's definition for volatile chemical includes many
13 polynuclear aromatic hydrocarbons that do not volatilize
14 in a specific amount. Could you please clarify whether
15 any of these chemicals are included in Appendix A, Table
16 J?

17 MS. HURLEY: Appendix A, Table J is the list
18 of TACO volatile --

19 MR. RAO: Oh, okay. Yeah.

20 MS. HURLEY: -- chemicals for the indoor
21 inhalation exposure route. That includes Naphthalene and
22 2-Methylnaphthalene, which I believe are the only PNAs,
23 and it does not include any of the PNAs that would not
24 volatilize. That's why we chose the definition that we

1 have in TACO for volatile chemical, to exclude the
2 chemicals that would not volatilize.

3 MR. RAO: Any reason why USEPA included some
4 of these PNAs which do not volatilize as volatile
5 chemicals? Is there any concern with those chemicals in
6 terms of indoor inhalation? I see Dr. Salhotra shaking
7 his head here, saying no, but --

8 DR. HORNSHAW: Part of the reason we chose
9 naphthalene is because it's included in both method 8260
10 and method 8270, 8260 being volatiles and 8270 being
11 semi-volatiles, so we chose that as a cutoff point to
12 determining whether a chemical meets the definition of
13 volatile chemical or not.

14 MR. RAO: Okay. Thanks for the
15 clarification.

16 MS. GEVING: Could we just have Dr. Salhotra
17 sworn at this point? Because he may want to add some
18 testimony.

19 HEARING OFFICER MCGILL: Sure. Would you
20 please swear in the witness?

21 (Witness sworn.)

22 HEARING OFFICER MCGILL: You want to go
23 ahead and introduce --

24 MS. GEVING: This is Dr. Atul Salhotra with

1 the RAM Group out of Texas, correct? Dr. Salhotra, do
2 you have anything to add to that last question, any
3 response?

4 DR. SALHOTRA: I think that's correct. The
5 other one you can add is the solubility of those
6 chemicals is very small, so there's going to be very
7 little of those chemicals present in the groundwater.

8 MR. RAO: Okay. That helps. Thank you.

9 HEARING OFFICER MCGILL: Thank you.

10 MS. LIU: Miss Hurley, you're on the hot
11 seat today. In Appendix C, Tables B and D, the Agency
12 proposes to revise the source information for some of
13 those parameters listed from what was used as IEPA and
14 then, in parentheses, IRIS/HEAST, to simply just the
15 Illinois EPA as the source. You explain on page 11 of
16 your prefiled testimony that this is simply to simplify
17 the source information. I understand from reading your
18 prefiled testimony and now the record explains how this
19 reflects the new hierarchy and -- that was described in
20 the OSWER Directive. However, I think the simple
21 reference in the table now to just Illinois EPA might be
22 a little too vague for somebody actually using the table
23 later on. I was wondering if it might be possible for
24 the Agency to consider maybe a footnote to that Illinois

1 EPA source that might elaborate on what sources you did
2 consider in an overall sort of way.

3 MS. HURLEY: Most of the -- well, all of the
4 toxicity values that were used are on the Agency's Web
5 site, in the Bureau of Land TACO Web site. That's one of
6 the reasons we referenced -- we put the source as
7 Illinois EPA. We could put that in a footnote, refer
8 people to the Agency's Web site. It might get a little
9 complicated to put all the sources in a footnote that we
10 considered, the IRIS and HEAST or Cal/EPA or PPRTVs.

11 MS. LIU: Is the Web site something that
12 would list those kinds of things, then, if somebody went
13 there to look?

14 MS. HURLEY: I don't believe -- We don't
15 believe it has the source, the source listing on the Web
16 site. I think -- We think it's just the values.

17 MS. LIU: Just for the benefit of the user
18 to understand what the source of the information is?

19 MS. HURLEY: Okay.

20 MS. LIU: For me, I could just put your
21 phone number down, but somebody else using it, I don't
22 know if that would be appropriate.

23 MS. HURLEY: Okay. All right. We'll
24 consider it. Thanks.

1 HEARING OFFICER MCGILL: And certainly if
2 you just want to reconsider keeping it the -- I have
3 focused on that part of the proposal or your testimony,
4 but it looks like you're considering just streamlining
5 some, instead of having IEPA, IRIS/HEAST, it would be
6 Illinois EPA, and so I'm sure one of the things you'll
7 look at are the merits of making that change or keeping
8 it for the more descriptive language.

9 MR. RAO: And I had a question for you,
10 Miss Hurley, along the same lines regarding the default
11 physical and chemical parameters you have in Appendix C,
12 Table E, and on page 11 of your testimony you note that
13 these default physical and chemical parameters are based
14 on several USEPA online databases and the Handbook of
15 Environmental Degradation Rates, and in Table E it
16 basically lists the physical and chemical parameters but
17 there's no information about the sources. Does IEPA's
18 TACO Web site have any information about where these
19 parameters are coming from?

20 MS. HURLEY: Well, no, we don't believe
21 it -- the Web site contains that information. I think --
22 We think the Web site just lists the values.

23 MR. RAO: Do you believe it would be helpful
24 for the regulated community or anyone who's interested in

1 looking at the rules to see where these numbers come
2 from?

3 MS. HURLEY: I -- Are you suggesting that we
4 footnote each individual value with the reference?

5 MR. RAO: Have you done that? I'm not
6 expecting you to put a footnote for every chemical. At
7 least in the record there's no information as to where
8 these numbers are coming from. For example, recently
9 when we did the groundwater rulemaking, which is still
10 ongoing, for every change there was information provided
11 into the record as to the source of the default
12 parameters that were used in determining those standards.

13 MS. GEVING: Would the Board consider
14 perhaps doing a board note at the very end of a table
15 stating that the various chemicals may have come from and
16 then list X sources just as a general board note at the
17 end, perhaps?

18 HEARING OFFICER MCGILL: We can certainly
19 look at that. I think right now we're just -- we're less
20 concerned about the rule language and more just
21 developing this record so that we know the source of the
22 proposed values.

23 MR. RAO: Yeah.

24 MS. GEVING: Okay. We can take a look at

1 that and see -- maybe make a suggestion the best way to
2 get that information in there.

3 MR. RAO: Thank you.

4 HEARING OFFICER MCGILL: Thank you.

5 CHAIRMAN GIRARD: Let me just -- I want to
6 go back to something Anand asked about earlier for, you
7 know, consider looking at the definition of water table
8 and whether we should include that here, but also bring
9 in another question that wasn't quite answered dealing
10 with capillary zone and saturated zone. Maybe when
11 you're considering whether or not to put a definition of
12 water table in here, maybe we should also look at a
13 definition for capillary zone and saturated zone.

14 MR. KING: Okay.

15 CHAIRMAN GIRARD: And then in addition to
16 your proposed language, if you decide to put that in, you
17 know, give us a discussion of how these different terms
18 would interrelate, whether they're distinct terms or
19 whether they overlap, whether you've got a general term
20 or whether you've got a general understanding throughout
21 the rule that's very specific.

22 MR. KING: Okay. I think that's a fair
23 request, and we'll look at how best to handle that.

24 CHAIRMAN GIRARD: Thank you.

1 HEARING OFFICER MCGILL: I think at this
2 point we're going to take --

3 MR. KING: Can I just --

4 HEARING OFFICER MCGILL: Sure.

5 MR. KING: I want to make one other comment,
6 and just kind of going back to Mr. Reott's comments about
7 the significance of this rule, I wanted to -- a couple
8 comments on what we have done with this proposal that are
9 different from what has happened in other states, okay,
10 because you may -- in the course of reading about the
11 controversies related to vapor intrusion, you might, you
12 know, hear or read about what's going on in the different
13 states and their approaches. We've done two really I
14 think significant things that are different. One is
15 related to the different forces that act upon
16 contaminants as they move through soil gas into a
17 building, and Dr. Salhotra will talk about this later,
18 but the concept of diffusion and advection, okay? In our
19 Tier 1 table, we developed the numbers based on
20 diffusion. In other states, they have developed their
21 objectives based on diffusion plus advection. It makes
22 for in some cases a considerably more conservative Tier 1
23 number. We didn't think that that was -- it was
24 necessary to use that advection component in establishing

1 a Tier 1 table; that we felt that what we had was
2 conservative enough as it was and adding in those -- that
3 advection component was going to be overly conservative
4 for a Tier 1 table.

5 The second thing we did which is different from a
6 number of other states, you'll see for instance in New
7 York and New Jersey, they are -- basically they're
8 reopening a huge number of closed sites to relook at the
9 indoor inhalation component. We're not proposing that be
10 done. In fact, one of the questions that IERG posed to
11 us really was related to information on our Web site that
12 we -- which we discussed that. We're not -- The only
13 time we're planning on looking towards reopening a site
14 that's got an NFR letter in place is where we've got new
15 site-specific information that indicates that there is an
16 actual problem. We're not going to approach, as other
17 states have had, of reopening all closed sites to relook
18 at this. So it continues to be and Mr. Reott is correct
19 that this is a significant rule, but I just want to point
20 out that we've done some -- we've made some significant
21 decisions that are embodied in here that tend to reduce
22 some of the difficulties that other states have had as
23 they've implemented vapor intrusion policies or
24 guidances, or however they're doing it.

1 HEARING OFFICER MCGILL: Thank you.

2 MS. LIU: May I ask a question to follow up
3 on that?

4 HEARING OFFICER MCGILL: Sure.

5 MS. LIU: How does the Agency envision new
6 site-specific information coming out as a result of a
7 problem or somebody just being curious?

8 MR. KING: I think it's going to be more of
9 a situation where there's a problem identified.

10 MS. LIU: Okay.

11 MR. KING: You know, there could be a
12 situation where a new owner comes in and now is
13 evaluating the site for some reason and thinks that there
14 is a problem and now they want to come back and address
15 it, or we could get a citizen complaint relative to a
16 problem. That's what -- That's the kind of situation
17 we're looking at, something that's focused on that site.

18 HEARING OFFICER MCGILL: Thank you. At this
19 point we're going to take a ten-minute break. It's
20 12:25, so we'll start up again at 12:35. We'll go off
21 the record.

22 (Brief recess taken.)

23 HEARING OFFICER MCGILL: Why don't we go
24 back on the record, and I believe we're going to proceed

1 at this point with the slide presentation and testimony
2 of Dr. Salhotra.

3 MS. GEVING: Correct.

4 HEARING OFFICER MCGILL: Thank you.

5 MR. KING: Before we begin, could I just
6 give a few brief comments about --

7 HEARING OFFICER MCGILL: Sure. Is this
8 regarding the follow-up to the --

9 MR. KING: No, it's actually in regard to
10 the presentation.

11 HEARING OFFICER MCGILL: Okay. I wasn't
12 sure. You had potentially wanted to follow up on --
13 supplement one of your responses to Anand Rao's question.

14 MR. KING: Yeah. I think what we're going
15 to do is rather than respond to that today, Board Member
16 Girard really, you know, posed the question to us about
17 definitions for saturated zone and water table and
18 capillary fringe, and I'd like to really for purposes of
19 the next hearing come back and have something as a
20 concrete recommendation on those as a way to respond to
21 that question.

22 HEARING OFFICER MCGILL: Thank you.

23 MR. KING: Dr. Salhotra has been involved
24 with us on a consulting basis in helping us put together

1 our proposal, and as you will see, he's got a -- he's
2 taught classes here at IEPA relative to this pathway, and
3 our association with him goes back many years. When we
4 were first developing the TACO rules back in the
5 mid '90s, Dr. Salhotra made presentations to us with
6 regards to kind of the whole fabric of how cleanup
7 objectives fit together with the risk issues and that, so
8 we've had a long history with him, and, you know, we
9 wanted to have him present to the Board here relative to
10 the indoor inhalation pathway because we thought it'd
11 give the Board a little better understanding of some of
12 the real fundamental scientific issues related to this
13 pathway, and that's his purpose in being here.

14 DR. SALHOTRA: Thank you very much for
15 having me here and for your patience. Given the weather
16 and so forth, I wasn't sure whether I'd make it here, but
17 thank you very much. And as Mr. King mentioned, I've
18 been associated with the Department for several years
19 now, and last few years in particular we've been doing a
20 lot of work related to the indoor inhalation pathway.
21 We've had training here, we've had a lot of discussions,
22 and I really enjoy -- it was a very enjoyable experience
23 in working with the team that is over here, and I think
24 it's a fantastic team that has worked very hard to

1 understand the pathway and put together a methodology
2 that is very practical and recognizes that there are a
3 lot of controversies and there are a lot of scientific
4 information that is coming out of this pathway, and it
5 has a very good balance of being very practical and very
6 feasible, and I think it'll be a great program to see how
7 it works.

8 So with that, the agenda here is I'm going to
9 talk about three main things; introduction to the
10 pathway -- and some of it may be repetition because you
11 all have heard about it, thought about it, seen it. The
12 second part is how do chemicals move in the soil and what
13 are the forces that drive chemicals to move from the
14 source into the buildings, and also talk about the
15 methods that are out there to evaluate this pathway.

16 So let's talk about the pathway. What we are --
17 The pathway that -- The new inhalation pathway is shown
18 to the right, and this is what we already have in the
19 TACO program, so this is a situation where you have soil
20 that is impacted, has some chemicals that may volatilize,
21 and then you have a building sitting on top of this
22 contaminated material or a building that may be built in
23 the future, and the concern is vapors might radiate from
24 this soil, entering the building and causing adverse

1 health effects to the people living inside the building.

2 And this is -- it's in the unsaturated zone above
3 the water table, and the second pathway that we are
4 talking about is very similar except that the
5 contamination is now under the water table, so it's in
6 what we call the saturated soil, saturated with water,
7 and above this water table, which of course fluctuates
8 over time, there is a capillary fringe, which is a zone
9 which is essentially full of moisture, and vapors can
10 migrate through the capillary fringe through the
11 unsaturated zone and get inside the homes and cause a
12 potentially adverse health effect. So the big question
13 is, how clean is clean, how clean is this groundwater,
14 what should be the concentration of the groundwater that
15 will make it safe for people to live on top of this type
16 of a situation, or, if they are not there, to build a
17 building, and it could be a residence, residential
18 building, or it could be a commercial/industrial type of
19 building.

20 So when you think of this pathway, there are six
21 discrete side effect things that are happening here. The
22 first one is that you have some contamination under the
23 building, under the ground surface, and chemicals have to
24 volatilize, and not all chemicals volatilize, so in the

1 rule we have a definition of what is the -- it has a
2 definition of volatilization, and there is a list, as we
3 talked earlier, of the volatile chemicals. Once the
4 chemicals volatilize, then they have to migrate, because
5 if they volatilize and stay there, ten feet, fifteen
6 feet, five feet below the building, there is not going to
7 be any adverse risk to anyone. So in this particular
8 case, the second step is for those chemicals to migrate
9 from the point of volatilization. We can call it source
10 for -- the source that we refer in the definition to, but
11 for this, we can think of that as a source and migration
12 of those chemicals into the buildings, so that's the
13 second process that will happen.

14 The third thing is for these chemicals, they must
15 enter the living space or the working space inside the
16 building, because if they stay outside the building and
17 the building prevents it from migrating into the
18 building, again, there will not be any adverse health
19 effects to people who are inside the building. So that's
20 an important third step. The next thing is once
21 chemicals enter the building, those chemicals mix with
22 the indoor air because there is a natural draft, natural
23 mixing going on of the air inside the building, and that
24 causes those chemicals to mix with the air, which then

1 have to be inhaled by the individuals to cause potential
2 adverse health effects. So the fourth step causes a
3 certain concentration in the air. The fifth step is
4 obviously if there are people living there, they would be
5 breathing, and so chemicals potentially get inside there
6 or the body, and then we look at the toxicity of the
7 chemical to see if it is a potential adverse health
8 effect. So in the rules that you are seeing, there are
9 these six steps that are -- that help you evaluate this
10 part.

11 BOARD MEMBER LIN: May I ask a question now?

12 DR. SALHOTRA: Sure, any time.

13 HEARING OFFICER MCGILL: Sure.

14 BOARD MEMBER LIN: The mixing, vapor and
15 air, is there any chemical reaction that become nontoxic
16 or more toxic?

17 DR. SALHOTRA: Yeah. Typically the
18 chemicals that we are talking about are not going to
19 react with the air inside the building and cause some
20 chemical reactions, so typically we are talking about
21 very low concentrations and we are not talking about any
22 reaction inside the building.

23 So these are the six steps, and it helps you
24 conceptualize and break this complex process into

1 individual pieces and kind of visualize as to what's
2 happening here.

3 Now, as we talk about this, one of the factors
4 that affect the migration of these chemicals into the
5 building -- and there are several factors -- first of
6 all, the source is important; in other words, what type
7 of chemicals do we have, which chemicals do we have and
8 where are they located, are they three feet below the
9 building or are they fifteen feet below the building. So
10 the characteristics of the source have an effect on this
11 pathway. Then we have the media through which chemicals
12 migrate. We already talked about capillary fringe, the
13 vadose, or what's called the unsaturated zone, the
14 building materials through which chemicals may migrate
15 into the building and if there are cracks in the floor,
16 they are not open cracks, there are some dirt or soil
17 inside those cracks. So those media have an effect on
18 the migration, and then each of these media has certain
19 properties, like the porosity, water content,
20 permeability and organic carbon content, which
21 essentially describe each of these media, so -- and I
22 think all of these terms are the ones for which there are
23 default values and for which are defined in the rule,
24 proposed rule.

1 Other factors that affect this pathway are the
2 characteristics of the building, the type of air
3 conditioning system you have, the amount of ventilation
4 you have in the building, the size of the building,
5 whether you have any preferential pathways that allow
6 vapors to get into the building, the use of the building,
7 so these are all characteristics of the building, and
8 then of course we have the general climatic factors. The
9 higher the temperature, the greater is the
10 volatilization, or if the -- there is an atmospheric
11 pressure which is a low atmospheric pressure, you could
12 have degassing of the vapors. So these atmospheric
13 pressure are generally a very transient phenomena, and
14 so -- but the temperature can have an effect, although we
15 are talking about chemicals coming from five, six, ten
16 feet below ground where the temperature does not change
17 as much as it will change in the atmosphere.

18 But these are all the factors that are
19 considered, and because of all these factors, this
20 pathway is more complex than the other pathways, and in
21 fact, in the last four or five years, I don't think you
22 could have gone to any environmental conference or
23 gathering of individual professionals without having some
24 discussion of this pathway, and what makes this complex

1 is the factors listed here. First of all, there are many
2 factors that affect the migration intrusion of vapors
3 into a building. Not only are there many factors, but
4 these factors also have some spatial and temporal
5 variability. Things change in time. The ventilation
6 system in the building changes with time. The
7 concentrations of chemicals in the soil is going to be
8 different, so there's differences in space and time.

9 There are many factors that are site-specific but
10 they cannot easily be measured, so we have to rely on
11 good professional judgment and default values. We
12 already talked about -- There was a question about
13 capillary fringe. It can vary from one location to
14 another, but it is difficult to measure, and so a more
15 practical approach is to adopt some default values that
16 are generally accepted in the industry. The number of
17 cracks and the size of cracks in the walls of basements
18 or floors affect this pathway.

19 The other complicating factor is that there are
20 many chemicals that have indoor sources. The same
21 benzene that we consider a contaminant, we have a leak of
22 gasoline, is also the chemical that is generated if
23 someone smokes inside a house. The same solvents, PCE,
24 that we consider a contaminant is the chemical that

1 dry-cleaners use to clean our clothes. Every time we
2 bring clothes into our house that are dry-cleaned, we
3 bring trace of those chemicals into our home. A lot of
4 our cleaning products have those chemicals. So that adds
5 a big -- a huge dimension to the complexity of this
6 pathway, and because of these indoor sources, if you have
7 elevated indoor air concentrations, they -- it does not
8 necessarily imply that there is a contamination problem
9 under the building, so those high sources may just be
10 because of the activities that are going on inside the
11 building.

12 The -- So those are all the complexities, but the
13 first thing that we have to do is determine whether this
14 pathway is really complete, whether we need to evaluate
15 this pathway at a given site, and here are some factors
16 that have to be present for the pathway to be complete.
17 If the pathway is not complete, that means it does not
18 need to be evaluated on the site. So the first one is
19 the presence of volatile chemicals. If you have a site
20 with only metals problem, other than mercury, then you
21 will not have any vapor intrusion issues. The presence
22 of a building, current or in the future, the -- and
23 typically, if you have a building, you are going to have
24 some human receptors inside it. The question is for what

1 period of time. And then if you do not have a barrier
2 that prevents the migration of vapors into a building,
3 then in those situations this pathway will be complete
4 and has to be evaluated.

5 Now, we have a history of evaluating this
6 pathway. The most recent major publication is the ASTM
7 standard, although there is some debate as to how that
8 standard can be modified and adjusted or perhaps even
9 removed, but it is a good document, has a lot of good
10 references and is being actively used in many parts of
11 our country.

12 Now, the next part of the discussion is how do
13 these vapors move, so if you imagine a building with ten
14 feet of clay under it and below that you have a volatile
15 chemical, what causes those molecules of benzene or any
16 of the other volatile chemicals to get inside the
17 building? There are two known forces or known phenomena
18 that cause that to happen. The first one is diffusion
19 and the second one is advection, and in the next few
20 slides I'm going to briefly talk about each of these two
21 processes.

22 So the first one is diffusion, and diffusion is
23 something that happens all the time, and what -- the best
24 way to visualize it is if you take a bowl of water and

1 drop -- put a drop of ink over there in the middle of it
2 and let it sit there for a long time, and we know just
3 from empirical experience that over time that blob of ink
4 or that blob of color will spread in the water, so the
5 fact that it spread means that the molecules of ink have
6 vibrated from where we put the drop to further away from
7 that source. That phenomena is what we call diffusion,
8 and it happens because molecules are always in a state of
9 continuous vibration. In solids they might vibrate
10 slower; in gas they vibrate at a higher frequency and
11 have a -- can travel more. And so diffusion, although in
12 this case I was talking about water because you can
13 visualize it, the same thing happens in air, and so this
14 is the phenomena of diffusion.

15 So just a few characteristics of this, it occurs
16 due to molecular vibrations, and none of us here have any
17 control over how the molecules vibrate, and so that's why
18 this is a primary phenomena that happens all the time.
19 It causes mass to move from areas of high concentration
20 to area of low concentration, and high concentration, low
21 concentration is where you have a large number of
22 molecules versus less molecules, and in nature, the
23 effort is to reduce those differences, and so vapors will
24 move from high concentration to low concentration. We

1 have high concentration in the source, ten feet, five
2 feet, three feet below the building, we have low
3 concentration inside the building, and so there is a
4 diffusive flux or diffusion that will cause -- that will
5 tend to equalize the concentrations, and we've known this
6 phenomena for a very long time, and mathematically, there
7 is a law called the Fick's law which we use to estimate
8 how much of the benzene from the subsurface soil gets
9 inside the building by diffusion, and this is the
10 phenomena that we have included in the proposed rule.

11 Now, the other mechanism by which -- well, before
12 I get to that, these are the various factors that come
13 into diffusion, and we already talked about porosity and
14 water content and the spatial variability, and those are
15 all factors that are included in the rules. For example,
16 you can have a building here, and what you see here is
17 the foundation or the floor of the building and these are
18 the cracks, and you can have some clay, you can have some
19 sand, and below that you might have the source, and so
20 vapors have to diffuse through sand, through clay,
21 through these dirt-filled cracks to get inside the
22 building, and this variability in the subsurface
23 formation is included in our evaluations.

24 Now, the other mechanism by which vapors can get

1 inside the building is what we call advection, and
2 advection is the migration of chemicals due to bulk
3 movement of air which occurs due to pressure differences.
4 If you have an area of high pressure and an area of low
5 pressure, you will have movement of air. That's why we
6 have wind speed, that's why we have ocean currents. And
7 so if we have a building that is under low pressure and
8 we have high pressure under the building, then that high
9 pressure will essentially push the vapors into the
10 building, and that process is what they call advection.
11 It's no different than what happens in a vacuum cleaner.
12 It basically sucks the dirt. It has high pressure at one
13 place, outside the pressure is low, and so it pulls the
14 dirt away from the -- it pulls the dirt.

15 So the -- So this particular phenomena is
16 variable. If you do not have a pressure difference
17 between the building and the source, this pathway will
18 not -- this process will not occur. Also, the zone of
19 influence of this pressure is very small, so if -- even
20 if you have a low pressure in the building, about four or
21 five feet, three feet below the building, that effect of
22 that low pressure is not as strong, and so for this and
23 other reasons, this is included only in Tier 3 of the
24 proposed rules. So we don't neglect it completely, we

1 incorporated it into Tier 3 if the situation requires
2 that it be evaluated.

3 Now, I hope this gives you some general idea of
4 the pathway we are talking about and how chemicals move.
5 The next part of my discussion is so how do we develop a
6 methodology to evaluate this situation, and different
7 states have different ways to evaluate this pathway, but
8 if you look at all the states and the ASTM standard and
9 USEPA's guidance and any of the numerous papers and
10 publications, you can divide all the methods into two
11 categories, so the first one is where you evaluate the
12 pathway by collecting indoor air samples, so you go
13 inside the building, whether it is commercial, industrial
14 or a residential, and you measure the indoor air
15 concentration and then you see if it meets the indoor air
16 standard.

17 The other approach is where you actually collect
18 soil, groundwater or soil gas samples below or adjacent
19 to the building and then use that to decide whether the
20 situation is safe or not. So in other words, rather than
21 having indoor air standards, you have standards that
22 apply to the soil vapors or the soil contamination or
23 groundwater contamination, which is where the problem is
24 originating. So there are two very different approaches,

1 and different states use different combinations of these
2 approaches, they give different weights to these
3 approaches, and each of them has its own unique pros and
4 cons, so let me briefly talk about that, and then I can
5 just tell you how we are handling these two approaches in
6 the proposed rule.

7 The -- If you decide to use the first approach,
8 which is to go inside the building and measure the
9 concentration, you have to do two things. First you have
10 to measure the concentrations and then you have to
11 evaluate the measured concentrations, and measuring the
12 indoor air concentrations is not that difficult. You
13 know, you can -- if you follow the correct protocols and
14 you put your instrumentation correctly, it's a relatively
15 straightforward procedure. It is intrusive, so it has
16 certain disadvantages, but it can be done rather easily,
17 but the problem is, once you get the data, evaluation of
18 that data makes it very difficult because of the numerous
19 indoor air sources of chemicals, so if you measure
20 concentration in an industrial building that we suspect
21 is being impacted by vapors coming from below and we go
22 inside and we measure the concentration, we don't know
23 whether that concentration is coming from below into the
24 building or whether it is because of chemicals that are

1 stored inside the building, and the chemicals that we are
2 dealing with oftentimes are not so unique that we
3 wouldn't have them inside the building, so that makes it
4 very difficult to evaluate the data and to determine what
5 is the cause of the problem, if there is one. And so
6 because of this reason and because here are all the
7 sources of indoor air pollutants that we are talking
8 about --

9 MR. KING: Is that your basement, Atul?

10 DR. SALHOTRA: Well, in Texas we have big
11 garages that look like that. Yeah, it's only in Texas
12 you'll have a \$30,000 car outside and everything in the
13 basement -- in the garage is what's probably \$1,000,
14 right?

15 So anyway, there are many, many indoor sources,
16 and so what we have said in our rule is that in Tier 3,
17 on a site-specific basis you can measure indoor air
18 concentration, then evaluate them if it makes for a
19 site-specific -- if that type of evaluation and analysis
20 is required at a site. However, in -- what we do in the
21 rule is we have soil, groundwater and soil vapor
22 concentrations that were developed using a model that is
23 publicly available and has been used by USEPA and many
24 other agencies and states.

1 Now, this model, it's obviously a very technical
2 model, but what it really does is simulates those six
3 steps that I talked about earlier, the volatilization of
4 chemical, the migration of chemical entering into the
5 building, mixing with the building, and then somebody
6 breathe that, and then it calculates the risk, okay? So
7 without spending too much time in the nitty-gritty
8 details of this model -- and of course you can ask me
9 questions and I'll try to answer those -- but basically,
10 this model simulates those six steps using indoor
11 parameters that we talked about some of those that are
12 default values, which are all in the rule, and then comes
13 up with what we call the acceptable soil and groundwater
14 and soil vapor concentrations. So we have three
15 standards, so to speak, soil concentration, groundwater
16 concentration and soil vapor concentrations, below or
17 adjacent to the building that are considered protective
18 of this pathway, and those are based using this model and
19 using the diffusion process that we talked about and
20 using the six steps that I alluded to earlier.

21 And we can go through each of the steps. The way
22 the model does the calculation is it first looks at the
23 building and says what is acceptable concentration inside
24 the building. That of course depends on how long a

1 person is there and their characteristics and of course
2 the toxicity of the chemical that we are dealing with, so
3 it takes that value and then does a calculation for each
4 of those other five steps now, because the sixth step is
5 just done, five steps, and comes up with a factor which
6 we call the attenuation factor. Now, this is like a
7 catch-all factor which accounts for the soil, the
8 chemical properties of the chemical, the properties of
9 the building and all those factors that we talked about
10 and gives you the relationship between the concentration
11 inside the building and what you can expect ten feet
12 below the building, and this -- of course that
13 relationship depends on the type of soil and the
14 characteristics and so forth, and those are all accounted
15 for in this model and sort of embodied in this
16 attenuation factor. And so in the first step, we -- the
17 model calculates what is acceptable for us to breathe and
18 in the second step it calculates this alpha, and based on
19 that, it calculates an acceptable soil gas concentration.

20 So as I mentioned, the attenuation factor
21 accounts for the migration of contaminants from the
22 source through the vadose zone. The source of
23 contaminant can be either soil or groundwater, and if the
24 chemical is in groundwater, then we have the capillary

1 fringe through which vapors have to migrate. The
2 attenuation factor also accounts for the migration of
3 contaminants through cracks in the slab-on-grade or
4 basement floor and then mixing within the air inside. So
5 all those factors we talked about are embodied in this
6 factor.

7 Now, the last thing over here is sometimes the
8 way chemicals occur in groundwater is shown here, and
9 what you have in each of these closed -- the picture of
10 closed thing over here is a particle or soil, so this
11 could be a sand particle, this is a gravel piece and clay
12 particles, and in between these various clay particles is
13 space, and that space is either filled with some moisture
14 which may have chemicals in it or some of that space is
15 filled with vapors, which are the ones we are talking
16 about that migrate, and then some of those chemicals are
17 absorbed onto the soil, and so within the model, it
18 accounts for this complex soil that occurs below the
19 building and looks at how much of the chemical is in the
20 moisture, how much of the chemical is in the vapors, how
21 much of the chemical is stuck to soil, and uses this
22 information to come up with the soil, groundwater and
23 soil vapor target levels.

24 And so if you summarize the -- kind of the entire

1 sequence of how this model works, you start with what is
2 considered the acceptable risk level, which has not
3 changed from the existing TACO regulations, and you look
4 at the toxicity of the chemical and the human body's
5 response to these chemicals and you estimate what is an
6 acceptable indoor air concentration, and then we have
7 another model that does calculations to come up with the
8 attenuation factors, and by combining the attenuation
9 factor and the indoor air concentration, you can get what
10 we call the acceptable soil gas concentration, and this
11 soil gas concentration here would be the Tier 1 remedial
12 objective. This is like the standard for soil gas. And
13 based on the properties of the soil and how the chemicals
14 partition between soil and groundwater and moisture, you
15 then can also estimate soil and groundwater
16 concentrations. So these are the three ROs that we have
17 in our proposal, soil gas concentration, soil and
18 groundwater concentration.

19 And to summarize, the indoor inhalation depends
20 on soil vapor concentrations; it depends on the
21 parameters of what is between the source and the
22 building; it depends on the building and certain
23 environmental parameters; and these are the parameters
24 that are included in the various tables for which we have

1 default values, which can obviously be changed to meet
2 site-specific conditions under Tier 2 or Tier 3.

3 So finally, the indoor inhalation pathway is
4 conceptually simple. We have the six steps from the
5 source to the building. There are many input parameters
6 on which this pathway depends on. The data that is
7 necessary can be collected and analyzed in a timely and
8 cost-effective way, the ones that we are requiring people
9 to collect. There are others that is a little bit more
10 complicated and costly, and so we have default values for
11 those. There are simple methods that can be used to make
12 the pathway incomplete. There are -- The rule allows
13 vapor barriers and other types of mechanisms to close the
14 pathway, so with the correct type of risk management and
15 correct type of barriers, you can make a pathway
16 incomplete, and then it involves building control
17 technologies and suggests that those be evaluated up
18 front as part of evaluating this pathway.

19 So I think I'll stop here, and again, as I
20 mentioned earlier, the rule that we have is very
21 practical, it's a very usable rule, and I think it
22 strikes a very good balance with the size and the
23 practicality of dealing with this pathway.

24 HEARING OFFICER MCGILL: Thank you.

1 DR. SALHOTRA: I'll take any questions that
2 you have.

3 HEARING OFFICER MCGILL: Mr. King?

4 MR. KING: Atul, I just wanted to just
5 clarify a question, just because this is on the record,
6 and it's kind of a small point, but I want to make sure.
7 The slide that you discussed the step 2 attenuation
8 factor definition --

9 HEARING OFFICER MCGILL: And let me just
10 interject here that the slide presentation is Hearing
11 Exhibit 4. Thank you.

12 MR. KING: I think, as I recall, you said
13 that this allows you to calculate, then, an objective at
14 ten feet, but I don't think you intended that to mean
15 only at ten feet. It would just be -- That would be --
16 It would allow you to calculate at a depth of ten feet,
17 but you could calculate it at other depths.

18 DR. SALHOTRA: That's right. This -- Yes,
19 and that's a -- this alpha or the attenuation factor
20 helps you calculate concentration at any depth below the
21 building, and so, yes, that's correct.

22 HEARING OFFICER MCGILL: Thank you. Are
23 there any questions from any members of the audience for
24 Dr. Salhotra? Go ahead. If you could again just restate

1 your name.

2 MR. REOTT: Raymond Reott. Doctor, what are
3 the forces that would retard the movement part of the
4 migration in this system that you've defined? Absorption
5 I assume would be one of them. What other forces are
6 there?

7 DR. SALHOTRA: Well, the -- as vapors
8 migrate from the source, they can absorb through the
9 soil, and that absorption through the soil can slow their
10 migration into the building, so that's one. But I think
11 the other factor that you might be thinking about and --
12 is that as those vapors might move up, certain of those
13 vapors, they biodegrade, and so it doesn't retard the
14 movement, but it reduces the amount of vapors that get
15 into the building.

16 MR. REOTT: How are these two factors
17 reflected in the model, absorption and biodegradation?

18 DR. SALHOTRA: Yeah. The absorption, when
19 we first calculate the soil vapor concentration using
20 this attenuation factor and then when it is converted to
21 an equivalence or a concentration, absorption is taken
22 care of at that point, so that's one place. As far as
23 the retardation during the process of vapors migrating,
24 that is not accounted for, and it's reasonable not to

1 account for it because the assumption is we have a large
2 source, and so the -- and it's a steady-state situation,
3 so retardation will only delay the -- or even slow the
4 movement, but it will not reduce the movement, so as far
5 as -- that's as far as retardation is concerned. So the
6 retardation that happens while the chemicals are moving,
7 the vapors are moving, has not been accounted for, but
8 it's not necessary because we are dealing with more
9 technically, if you recall, an infinite source, so if --
10 when you have an infinite source or a very large source,
11 then that factor is not relevant.

12 As far as biodegradation is concerned, that I
13 believe can be handled in a Tier 3 type evaluation. In
14 Tier 1 and Tier 2, the assumption is that the vapors do
15 not migrate, and there's a technical reason for that,
16 because really, biodegradation is such a site-specific
17 phenomenon that we cannot come up with a generic
18 biodegradation rate, and so it's best handled on a
19 site-specific basis if necessary in a Tier 3 type
20 evaluation.

21 MR. REOTT: Would the rate of absorption be
22 affected by the choice of sand as your default material
23 in the vadose zone?

24 DR. SALHOTRA: Yes, sand versus clay will --

1 well, if you're talking about retardation, yes. The
2 organic carbon content and the sand versus clay will
3 affect retardation. However, because we are talking
4 again of a very large infinite type source, steady-state
5 situation, retardation has no effect, so whenever we are
6 dealing with a non-degrading steady-state situation,
7 retardation in the movement is not relevant. All it does
8 is it delays when steady state is reached.

9 MR. REOTT: One of your slides described
10 the, quote, key technical components of the Johnson and
11 Ettinger model, and one of the bullet points was, quote,
12 finite source and infinite source. I take it the model
13 allows for the consideration of either of those two
14 options.

15 DR. SALHOTRA: Well, the original -- yes,
16 the model allows for that, but in our program, if someone
17 really wanted to use finite source, which would be very,
18 very, very rare situation, it would be -- could be dealt
19 with as a Tier 3 evaluation.

20 MR. REOTT: The current Tier 1 numbers have
21 been calculated, however, using an infinite source
22 assumption?

23 DR. SALHOTRA: Yeah, that is correct.

24 MR. REOTT: Just to make it clear.

1 DR. SALHOTRA: That is correct, but I think
2 we shouldn't go away thinking that infinite means
3 thousands and thousands of kilograms of contaminants. I
4 mean, that's not what we want. What we are really
5 talking about is a steady-state source, and so the amount
6 of vapor that get into the building relative to what we
7 have is what we have to consider in terms of infinite, so
8 I don't want anybody going away thinking that infinite
9 like we normally think of infinite being huge and
10 endless. What we are talking about is the relative mass
11 that goes in versus what comes out.

12 MR. REOTT: But the system has reached
13 stability.

14 DR. SALHOTRA: It's reached a steady state,
15 yes.

16 MR. REOTT: Does the mixing that occurs
17 under the model depend on the assumptions that are made
18 about the building size?

19 DR. SALHOTRA: The mixing -- It is assumed
20 that the air inside the building is completely mixed, so
21 the air inside the building, whether it is a small
22 building or a big building, is assumed to be completely
23 mixed, so I don't know if that answers your question.

24 MR. REOTT: For purposes of back calculating

1 the remedial objectives for either soil gas or
2 groundwater or soil, you have to assume a particular
3 building size.

4 DR. SALHOTRA: That's right.

5 MR. REOTT: Okay.

6 DR. SALHOTRA: And that building size, the
7 default values are given, and the assumption is that
8 within that building the air is completely mixed.

9 MR. REOTT: The -- There's also -- one of
10 the steps is sort of the entry into the building from the
11 subsurface.

12 DR. SALHOTRA: That's right.

13 MR. REOTT: There also must be a set of
14 assumptions about the frequency of cracks and media
15 within those cracks in the foundation.

16 DR. SALHOTRA: Yes, but going back to your
17 previous question, if you had a situation, let's say an
18 industrial setting, where there were two buildings with
19 very different ventilation rates because of the process
20 that they had going on, the -- you could include that in
21 a Tier 3 evaluation as we separate buildings by different
22 rates, so although for Tier 1, the size of the building
23 and inhalation -- and the mixing is -- there's a default
24 value in a Tier 3 setting that can be modified. But,

1 yes, there are certain -- to answer your second question,
2 yes, there are default values for the cracks and so forth
3 which are in the rule.

4 MR. REOTT: And last, I don't mean to
5 monopolize this, but you had explained some of the
6 reasons why it was hard to evaluate indoor air
7 measurement data. If you had negative data -- i.e., you
8 measured and you did not find a chemical -- is that as
9 hard to evaluate, or are you talking about false
10 positives?

11 DR. SALHOTRA: No, you are right. If you go
12 inside a building and measure indoor air concentrations
13 and those indoor air concentrations are below the
14 standards for indoor air, then the obvious conclusion is
15 there is no problem, so it doesn't matter whether
16 whatever you measured there, it came from inside the
17 building or below the building, so you are right. If you
18 measure indoor air concentration and the concentrations
19 are acceptable, then, yes, there is no problem.

20 However --

21 MR. REOTT: And that would assume that you
22 measured under representative --

23 DR. SALHOTRA: That's right. That's why in
24 my slide "representative" is underlined, which means, you

1 know, summer versus winter and, you know, weekends versus
2 weekdays, so there can be a lot of variation. There's a
3 lot of temporal variability. So as long as you can come
4 up with representative values, which may be difficult in
5 a particular situation or may not be depending on the
6 situation, that could happen, and that's why that's
7 allowed in Tier 3.

8 HEARING OFFICER MCGILL: Any additional
9 questions for the Agency witness? Seeing none, the Board
10 has one question.

11 DR. SALHOTRA: Sure.

12 HEARING OFFICER MCGILL: Maybe more, but go
13 ahead.

14 MS. LIU: Dr. Salhotra, thank you very much
15 for your presentation. In the Johnson and Ettinger model
16 there's a parameter N, as in Nancy, and it's the total
17 number of layers of different types of soil that vapors
18 migrate through. As used in equation J&E9a, I was
19 wondering if you could please describe how the number of
20 layers would be determined. Is that something that would
21 show up on a professional geologist's soil boring log?

22 DR. SALHOTRA: Yeah. Let me see if I can go
23 to my slide. Here. So the question is how many layers
24 to have between the source and the indoor building.

1 Typically that would be determined based on the boring
2 logs that you would do at a site, so at a given site you
3 would have monitoring wells or you may just have soil
4 borings, and when you drill those soil borings, you
5 collect samples to see how the stratigraphy varies under
6 the building, so you will look at those and then use that
7 to decide how many layers you want to have. In this
8 particular case I have two layers, and then the third
9 layer is the cracks, and if you have groundwater, there
10 will be four layers, because one layer is the capillary
11 fringe, so if it was groundwater, you would have
12 capillary fringe as your first layer and then sand is the
13 second, clay is the third, and this would be your fourth
14 layer, and that will be determined on the site.

15 HEARING OFFICER MCGILL: I'm sorry. You
16 said, "This would be your fourth," and you pointed. What
17 were you referring to?

18 DR. SALHOTRA: Oh, the fourth would be the
19 cracks, and this zone, only this part is relevant,
20 because the assumption is vapors are not going through
21 the concrete; they're only going through the cracks.

22 HEARING OFFICER MCGILL: Thank you. Are
23 there any other questions for any of the Agency
24 witnesses? Seeing none, I'll ask if anyone else is

1 interested in testifying today. Seeing no response, why
2 don't we go off the record.

3 (Discussion held off the record.)

4 HEARING OFFICER MCGILL: We just had a
5 discussion off the record about setting deadlines for
6 prefiling. I'm going to state what those deadlines are
7 now. For the second hearing, the deadline for filing
8 prefiled testimony is February 24, the deadline for
9 filing prefiled questions is March 5 and the deadline for
10 filing prefiled answers is March 12, and I'll put that in
11 a hearing officer order that I'll issue. The mailbox
12 rule will not apply to any of those filings, so the Board
13 will actually have to receive each of those filings on
14 those deadline dates. By those deadline dates, I should
15 say.

16 The second hearing for this rulemaking is
17 scheduled for March 17, 2009, at 10 a.m. in room 9-040 at
18 the James R. Thompson Center in Chicago. If business
19 remains at the end of that day, we will continue the next
20 day, March 18, beginning at 9 a.m. in a different room
21 within the James R. Thompson Center, and that's room
22 2-025. Copies of today's transcript should be available
23 on the Board's Web site no later than February 6, but
24 ideally sooner than that. If anyone has any questions

1 about the procedural aspects of this rulemaking, please
2 contact me.

3 Are there any other matters that need to be
4 addressed at this time? Seeing none, I would like to
5 thank everyone for their participation today, and this
6 hearing is adjourned.

7 (Hearing adjourned.)

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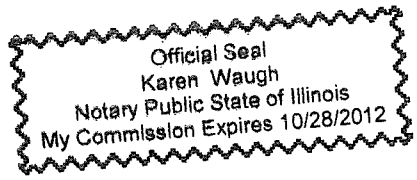
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1 STATE OF ILLINOIS)
) SS
2 COUNTY OF BOND)
3

4 I, KAREN WAUGH, a Notary Public and Certified
5 Shorthand Reporter in and for the County of Bond, State
6 of Illinois, DO HEREBY CERTIFY that I was present at the
7 Illinois Pollution Control Board, Springfield, Illinois,
8 on January 27, 2009, and did record the aforesaid
9 Hearing; that same was taken down in shorthand by me and
10 afterwards transcribed, and that the above and foregoing
11 is a true and correct transcript of said Hearing.

12 IN WITNESS WHEREOF I have hereunto set my hand
13 and affixed my Notarial Seal this 5th day of February,
14 2009.



Karen Waugh

Notary Public--CSR

#084-003688

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<p style="text-align: center;">A</p> <p>able 56:11</p> <p>about 6:24 7:14 14:7 14:13 15:11,11 18:5,7 20:1 33:6 34:14 35:19 36:23 37:1,11,17 38:12 38:20 39:1 40:5 41:11 44:5 45:14 51:11 54:24 56:7 57:8 62:17,18 63:20 64:6 65:6,10 65:12,17 68:6,16 70:9,11,11,14,16 71:4 73:18,20,21 74:3,12 75:15 76:12,12 78:20 79:12 80:13 81:20 82:4 83:4 84:8 85:3,11,19 86:9 87:5,16 91:11 93:1 94:5,10,18 95:14 96:9 99:5 100:1</p> <p>above 33:10 54:20 71:2,7 101:10</p> <p>absence 22:4</p> <p>Absent 8:12</p> <p>absorb 91:8</p> <p>absorbed 87:17</p> <p>absorption 91:4,9 91:17,18,21 92:21</p> <p>acceptable 85:13,23 86:17,19 88:2,6,10 96:19</p> <p>accepted 76:16</p> <p>accommodate 32:10</p> <p>account 29:7 48:7 92:1</p> <p>accounted 86:14 91:24 92:7</p> <p>accounts 86:7,21 87:2,18</p> <p>acknowledge 27:9</p> <p>across 16:24</p> <p>act 7:21 65:15</p> <p>acting 11:23</p> <p>action 1:5 5:9 14:19</p> <p>actively 21:24 78:10</p> <p>activities 77:10</p> <p>actual 24:9 26:13 32:13 40:5,20,21 46:6 66:16</p> <p>actually 9:12 19:20 24:7 33:2,3,12,20 60:22 68:9 82:17 99:13</p> <p>Adams 2:17</p> <p>add 5:14 13:15 59:17 60:2,5</p> <p>added 22:17,18,19</p>	<p>23:2 54:1</p> <p>adding 23:10,18 50:12 66:2</p> <p>addition 12:16 19:3 31:23 45:22,23 46:3 57:14 64:15</p> <p>additional 49:19 53:22 55:14 97:8</p> <p>additionally 43:1</p> <p>address 8:11 17:5 20:5 34:4 43:20 53:4 67:14</p> <p>addressed 14:14,15 16:24 43:2 100:4</p> <p>addresses 19:6</p> <p>addressing 31:16,24 35:9</p> <p>adds 77:4</p> <p>adjacent 82:18 85:17</p> <p>adjourned 100:6,7</p> <p>adjusted 78:8</p> <p>adjustment 35:15</p> <p>adjustments 35:16</p> <p>ADM 1:5</p> <p>Administrative 5:10</p> <p>admitted 6:22</p> <p>adopt 76:15</p> <p>adopted 12:21</p> <p>adopts 8:1</p> <p>advection 65:18,21 65:24 66:3 78:19 81:1,2,10</p> <p>adverse 25:16 70:24 71:12 72:7,18 73:2 73:7</p> <p>advise 44:13</p> <p>advisor 11:22</p> <p>advisory 13:22 14:8 14:23 15:8 27:20 47:3,8</p> <p>affect 38:4 45:16 74:4 75:1 76:2,18 93:3</p> <p>affected 40:13 92:22</p> <p>affects 38:8</p> <p>affixed 101:13</p> <p>aforsaid 101:8</p> <p>after 6:12 8:14 9:10 18:12 26:7 27:9 46:16 55:8,15</p> <p>afterwards 101:10</p> <p>again 9:3 13:20 15:12 16:6 31:2 32:8 33:15 34:20 37:6 38:8,9,15 40:17 44:3 46:9 51:11 67:20 72:18 89:19 90:24 93:4</p> <p>agencies 84:24</p>	<p>Agency 2:11 5:13,13 6:8 9:2 10:19 11:7 11:14,20 19:6 26:7 28:18,20 29:1,17 32:12 34:2 40:23 44:11 45:5 48:5 50:1 53:3 54:4 55:13 57:9,13 60:11,24 67:5 97:9 98:23</p> <p>Agency's 6:6,11 7:11 8:7 9:20,23 11:9,11,15 26:23 27:7 34:20 45:14 46:10 61:4,8</p> <p>Agency-proposed 49:24</p> <p>agenda 70:8</p> <p>ago 13:9</p> <p>agreed 50:2</p> <p>ahead 7:13 9:5 14:24 20:17 29:14 46:1 59:23 90:24 97:13</p> <p>air 15:24 19:23 40:6 43:5,6,8,12,14,17 50:23 52:16 72:22 72:23,24 73:3,15 73:19 75:2 77:7 79:13 81:3,5 82:12 82:14,15,21 83:12 83:19 84:7,17 87:4 88:6,9 94:20,21 95:8 96:6,12,13,14 96:18</p> <p>Albarracin 11:24</p> <p>Alec 2:16 27:15 31:21</p> <p>alerted 56:21</p> <p>Alisa 2:9 5:24</p> <p>allow 6:12 30:20 32:13 75:5 90:16</p> <p>allowed 13:14 97:7</p> <p>allows 89:12 90:13 93:13,16</p> <p>alluded 85:20</p> <p>Almost 38:19</p> <p>along 10:3,12 18:2 62:10</p> <p>alpha 86:18 90:19</p> <p>already 13:16 29:15 50:11 70:18 74:12 76:12 80:13</p> <p>although 75:14 78:7 79:11 95:22</p> <p>always 37:21,22 79:8</p> <p>amend 5:14 48:5</p> <p>amended 48:7,18</p> <p>amendments 1:4 5:8</p>	<p>12:20</p> <p>among 13:21 26:2</p> <p>amount 58:14 75:3 91:14 94:5</p> <p>analysis 26:14 39:3 39:15 84:19</p> <p>analyzed 52:7 89:7</p> <p>Anand 2:8 5:24 55:15 64:6 68:13</p> <p>Andy 12:2,3</p> <p>another 5:18 7:5 15:1 52:16 57:24 64:9 76:14 88:7</p> <p>answer 20:8,13,20 20:22 21:10,17 28:7 29:10 40:8 85:9 96:1</p> <p>answered 64:9</p> <p>answers 6:4 28:14 29:7 94:23 99:10</p> <p>anybody 40:13 94:8</p> <p>anyone 6:12 8:9 34:19 37:16 46:9 49:7 51:3 62:24 72:7 98:24 99:24</p> <p>anything 41:4 60:2</p> <p>anyway 84:15</p> <p>apart 31:10 41:18</p> <p>apparent 25:2</p> <p>APPEARANCES 2:1</p> <p>appears 37:10</p> <p>appendices 22:13,15 22:22 36:5</p> <p>Appendix 23:21 24:1,10 36:6 58:15 58:17 60:11 62:11</p> <p>applicable 27:10</p> <p>applicants 17:14 32:3</p> <p>applied 56:15</p> <p>apply 17:22 21:8 23:9 32:6 35:5 42:24 48:20 82:22 99:12</p> <p>appreciate 12:11 50:17 51:16 53:23</p> <p>approach 1:4 5:9 13:10 16:7 25:4,10 25:21 26:4 34:12 34:15 37:9 38:11 44:2,6,11,15 52:15 66:16 76:15 82:17 83:7</p> <p>approaches 65:13 82:24 83:2,3,5</p> <p>approaching 56:12</p> <p>appropriate 26:6 30:8 34:14 37:17 61:22</p>	<p>approval 26:7</p> <p>area 24:24 25:4 31:3 79:20 81:4,4</p> <p>areas 48:17,24 49:11,13 79:19</p> <p>aromatic 58:13</p> <p>around 7:9 13:12 45:4</p> <p>arrives 26:24</p> <p>Artrip 8:23 10:24</p> <p>aside 21:16</p> <p>asked 6:24 28:24 64:6</p> <p>asks 29:17</p> <p>aspect 44:8</p> <p>aspects 12:13 100:1</p> <p>assessment 12:5 17:20 24:21</p> <p>assist 18:2</p> <p>assistant 2:12 11:17</p> <p>associated 6:9 22:17 69:18</p> <p>association 69:3</p> <p>assume 36:18 38:13 91:5 95:2 96:21</p> <p>assumed 36:2,21 94:19,22</p> <p>assuming 39:10</p> <p>assumption 37:11 37:18 38:4 92:1,14 93:22 95:7 98:20</p> <p>assumptions 35:12 94:17 95:14</p> <p>ASTM 17:19,24 54:5,7 78:6 82:8</p> <p>atmosphere 75:17</p> <p>atmospheric 75:10 75:11,12</p> <p>attached 10:3,12</p> <p>attempt 40:3</p> <p>attention 49:8</p> <p>attenuation 86:6,16 86:20 87:2 88:8,8 90:7,19 91:20</p> <p>attorney 2:21 11:14</p> <p>Atul 3:5 6:8 10:9 59:24 84:9 90:4</p> <p>audience 34:19 46:9 46:15 90:23</p> <p>author 53:3</p> <p>available 8:5 25:18 84:23 99:22</p> <p>Avenue 1:9 2:13,22</p> <p>averaging 33:23,24 34:3,12,15</p> <p>away 79:6 81:14 94:2,8</p> <p>awkward 35:2</p> <p>a.m 1:8 5:2 99:17,20</p>
--	--	--	---	--

<p>B</p> <p>b 24:1,4,6 29:20 30:1 55:18 60:11</p> <p>back 7:2 13:1,15 14:12,22 15:4 25:19 33:21 35:3 37:21 49:7,18 50:18 51:10 55:8 56:2 64:6 65:6 67:14,24 68:19 69:3,4 94:24 95:16</p> <p>background 5:11 24:24 25:4</p> <p>balance 70:5 89:22</p> <p>barrier 18:11 78:1</p> <p>barriers 16:16 89:13,15</p> <p>based 18:16 33:22 40:4 62:13 65:19 65:21 85:18 86:18 88:13 98:1</p> <p>basement 84:9,13 87:4</p> <p>basements 76:17</p> <p>basically 39:24 62:16 66:7 81:12 85:9</p> <p>basis 56:8,15 68:24 84:17 92:19</p> <p>became 25:2 37:5</p> <p>become 42:6 73:15</p> <p>before 1:1,9 7:24 8:5 10:17 12:19 16:6,14 21:17 34:7 38:10 45:7 68:5 80:11</p> <p>begin 6:4 11:14 28:5 68:5</p> <p>beginning 99:20</p> <p>behalf 2:14,18,23 5:20 27:16,23 44:19,22 47:8</p> <p>being 49:14 59:10 59:10 67:7 69:13 70:5 78:10 83:21 94:9</p> <p>believe 28:23 58:22 61:14,15 62:20,23 67:24 92:13</p> <p>Belleville 1:16</p> <p>below 33:7,8 54:19 72:6 74:8,9 75:16 78:14 80:2,19 81:21 82:18 83:21 83:23 85:16 86:12 87:18 90:20 96:13 96:17</p> <p>benefit 32:1 61:17</p> <p>benefits 7:8</p> <p>benzene 76:21 78:15</p>	<p>80:8</p> <p>best 11:18 13:13 64:1,23 78:23 92:18</p> <p>better 5:10 15:18 17:10 51:14 69:11</p> <p>between 37:12 43:24 50:23 81:17 86:10 87:12 88:14 88:21 97:24</p> <p>big 42:20 71:12 77:5 84:10 94:22</p> <p>bigger 37:7</p> <p>biggest 39:17,19</p> <p>biodegradation 91:17 92:12,16,18</p> <p>biodegrade 91:13</p> <p>bit 15:11 20:13 29:5 89:9</p> <p>Blankenship 2:4 5:22</p> <p>blob 79:3,4</p> <p>board 1:1,8 2:3,4,5 2:5,7 5:5,12,20,21 5:22,23 7:6,22,24 8:3,6 12:20 27:11 31:21 45:6 46:13 46:15 49:13 50:2 63:13,14,16 68:15 69:9,11 73:11,14 97:9 99:12 101:7</p> <p>Board's 5:14 6:20 7:19 8:8 54:3 99:23</p> <p>body 73:6</p> <p>body's 88:4</p> <p>boiling 51:23 52:1,5 52:9</p> <p>Bond 101:2,5</p> <p>boring 97:21 98:1</p> <p>borings 98:4,4</p> <p>both 22:4 32:24 50:7 59:9</p> <p>boundary 21:4,12</p> <p>bowl 78:24</p> <p>break 7:11 46:17 55:15 67:19 73:24</p> <p>breaking 7:13</p> <p>breathe 15:24 85:6 86:17</p> <p>breathing 73:5</p> <p>Brian 15:7 27:18</p> <p>brief 67:22 68:6</p> <p>briefly 5:11 18:7 78:20 83:4</p> <p>bring 64:8 77:2,3</p> <p>broaden 29:4</p> <p>broadly 50:6</p> <p>broke 21:18</p> <p>build 13:15 38:9</p>	<p>71:16</p> <p>buildings 19:9,11 21:8 22:4 29:6 30:5,21 47:11,13 57:5 70:14 72:12 95:18,21</p> <p>building's 44:1</p> <p>built 70:22</p> <p>bulk 81:2</p> <p>bullet 93:11</p> <p>Bureau 11:18,24 61:5</p> <p>business 6:17 17:13 99:18</p> <hr/> <p>C</p> <p>c 18:15 21:23 24:10 29:9,20,21 30:1 36:6,11 52:20,21 55:20 60:11 62:11</p> <p>calculate 25:8 90:13 90:16,17,20 91:19</p> <p>calculated 22:15 38:8 93:21</p> <p>calculates 85:6 86:17,18,19</p> <p>calculating 94:24</p> <p>calculation 40:14 85:22 86:3</p> <p>calculations 88:7</p> <p>California 53:18</p> <p>call 15:17 47:22 71:6 72:9 79:7 81:1,10 85:13 86:6 88:10</p> <p>called 13:22 15:15 74:13 80:7</p> <p>Cal/EPA 61:10</p> <p>came 10:19 47:15 96:16</p> <p>capillary 54:23 55:19,21,23 56:1 64:10,13 68:18 71:8,10 74:12 76:13 86:24 98:10 98:12</p> <p>capital 21:22,22,22 21:22 53:12</p> <p>caps 53:17</p> <p>captioned 5:7</p> <p>car 84:12</p> <p>carbon 39:22 74:20 93:2</p> <p>care 7:18 9:11 48:15 48:16,22,23 91:22</p> <p>carefully 45:19</p> <p>case 7:13 16:18 25:2 25:12 31:18 40:4 72:8 79:12 98:8</p> <p>cases 65:22</p>	<p>catch-all 86:7</p> <p>categories 82:11</p> <p>cause 25:16 71:11 73:1,19 78:18 80:4 84:5</p> <p>causes 72:24 73:2 78:15 79:19</p> <p>causing 70:24</p> <p>celsius 52:13,14</p> <p>Center 99:18,21</p> <p>centimeters 38:17 39:1 55:20</p> <p>certain 73:3 74:18 83:16 88:22 91:12 96:1</p> <p>certainly 30:14 45:8 49:18 57:19 62:1 63:18</p> <p>Certified 101:4</p> <p>CERTIFY 101:6</p> <p>chair 15:8 34:24</p> <p>chairman 2:4 5:22 27:20 64:5,15,24</p> <p>challenging 40:1</p> <p>change 23:5 24:10 29:10 40:11 42:18 42:19,20,21 52:15 62:7 63:10 75:16 75:17 76:5</p> <p>changed 19:22 45:6 52:18 88:3 89:1</p> <p>changes 13:15 14:16 15:5 76:6</p> <p>changing 23:22,23 24:3,4</p> <p>characteristics 25:24 74:10 75:2,7 79:15 86:1,14</p> <p>CHEMFATE 53:11</p> <p>chemical 23:1,22 24:1 43:11,12 51:21,24 52:4,6,8 53:10,11 58:2,12 59:1,12,13 62:11 62:13,16 63:6 73:7 73:15,20 76:22,24 78:15 85:4,4 86:2 86:8,8,24 87:19,20 87:21 88:4 96:8</p> <p>chemicals 16:1 17:11 19:11 23:2 40:24 41:7 42:7,8 43:15 52:4,5 57:14 58:15,20 59:2,5,5 60:6,7 63:15 70:12 70:13,20 71:23,24 72:3,4,8,12,14,21 72:21,24 73:5,18 74:4,7,7,11,14 75:15 76:7,20 77:3</p>	<p>77:4,19 78:16 81:2 82:4 83:19,24 84:1 87:8,14,16 88:5,13 92:6</p> <p>Chicago 5:19 40:12 42:9,16 99:18</p> <p>chief 11:23</p> <p>child 48:16,23</p> <p>children 48:13,20 50:2,5,7</p> <p>chili 47:9,10</p> <p>chlorinated 40:19</p> <p>choice 33:11 92:22</p> <p>choosing 46:22</p> <p>chose 37:13 41:19 58:24 59:8,11</p> <p>circumstances 29:3 29:5,20 36:12</p> <p>citation 9:3 53:3 56:21</p> <p>cite 8:16</p> <p>cited 10:22</p> <p>citizen 67:15</p> <p>city 40:11 42:9</p> <p>clarification 59:15</p> <p>clarify 23:11 30:24 49:20 58:5,14 90:5</p> <p>classes 69:2</p> <p>clay 78:14 80:18,20 87:11,12 92:24 93:2 98:13</p> <p>clean 21:21 71:13,13 71:13 77:1</p> <p>cleaner 81:11</p> <p>cleaning 77:4</p> <p>cleanup 17:1 69:6</p> <p>clear 7:6 19:15 23:9 40:22 93:24</p> <p>clearly 48:20 51:4</p> <p>climatic 75:8</p> <p>close 47:22 50:17 89:13</p> <p>closed 66:8,17 87:9 87:10</p> <p>closely 52:16</p> <p>clothes 77:1,2</p> <p>Cobb 57:13</p> <p>Cobb's 57:10</p> <p>Code 1:6 5:10</p> <p>collect 82:17 89:9 98:5</p> <p>collected 52:20 54:19 89:7</p> <p>collecting 82:12</p> <p>collectively 11:11</p> <p>colloquial 15:14</p> <p>color 79:4</p> <p>colored 10:8</p> <p>column 24:11</p> <p>combinations 83:1</p>
--	---	--	--	--

<p>combining 88:8 come 12:19 13:15 43:13 47:4 51:15 55:8 63:1,15 67:14 68:19 80:12 87:22 88:7 92:17 97:3 comes 67:12 85:12 86:5 94:11 coming 14:12 19:23 51:15 56:6 62:19 63:8 67:6 70:4 75:15 83:21,23 comment 10:20,22 15:1 65:5 commenting 44:3 comments 14:22 65:6,8 68:6 Commerce 7:19,23 commercial 82:13 commercial/indus... 37:2 71:18 commitment 12:24 committee 13:23 14:8,23 15:8 27:21 47:3,8 communities 42:9 42:16,16 community 62:24 COMPANY 1:15 compare 40:24 compared 54:18 comparison 41:11 41:20 complaint 67:15 complete 25:13 77:14,16,17 78:3 completely 81:24 94:20,22 95:8 completeness 57:16 complex 73:24 75:20,24 87:18 complexities 35:20 77:12 complexity 77:5 compliance 43:6 54:15 complicated 61:9 89:10 complicating 76:19 complied 33:14 component 65:24 66:3,9 components 12:14 93:10 compounds 16:8 40:20 comprehensive 13:10 56:9 comprises 55:22 conceivably 48:23</p>	<p>concentration 25:15 71:14 73:3 79:19 79:20,20,21,24,24 80:1,3 82:15 83:9 83:20,22,23 84:18 85:15,16,23 86:10 86:19 88:6,9,10,11 88:17,18 90:20 91:19,21 96:18 concentrations 17:23 21:13 54:18 73:21 76:7 77:7 80:5 83:10,11,12 84:22 85:14,16 88:16,20 96:12,13 96:18 concept 16:16 50:8 65:18 conceptualize 73:24 conceptually 89:4 concern 16:1 21:13 59:5 70:23 concerned 63:20 92:5,12 concerns 7:18 22:12 conclude 6:18 concludes 22:7 24:15 26:7,23 conclusion 6:13 47:14 56:11 96:14 conclusions 36:8,15 concrete 68:20 98:21 condition 35:16 37:23 conditioning 75:3 conditions 39:6 89:2 conduct 7:23 8:7 conducting 8:4 conference 75:22 confused 32:22 cons 83:4 consecutive 47:21 conservative 36:12 37:8 38:11 41:21 65:22 66:2,3 consider 44:11,12 49:19 60:24 61:2 61:24 63:13 64:7 76:21,24 94:7 considerably 65:22 consideration 93:13 considered 47:10 51:7 61:10 75:19 85:17 88:2 considering 62:4 64:11 consistent 17:4 consolidate 52:8 constraints 34:10</p>	<p>construction 29:23 consult 37:16 consulting 68:24 contact 100:2 contain 28:20 contains 18:10 25:6 62:21 contaminant 39:6 76:21,24 86:23 contaminants 15:21 19:7 30:6 40:18 44:1 48:14,21 65:16 86:21 87:3 94:3 contaminated 15:24 17:12 19:17 30:9 30:17,18 32:18 37:12 38:13 70:22 contamination 19:16,16 21:20,21 22:1 29:11 31:4 33:5,7 38:16,24 43:21,24 44:7 71:5 71:22 77:8 82:22 82:23 content 39:23 55:21 56:1 74:19,20 80:14 93:2 contents 29:2 context 15:18 19:4 38:5,6 43:23 49:17 54:22 continue 13:1 99:19 continued 13:4,24 continues 38:11 66:18 continuous 79:9 contrast 24:22 control 1:1,8 5:5 15:2,4 16:15 18:10 18:14 30:11,20 42:24 79:17 89:16 101:7 controversies 65:11 70:3 conversation 20:9 converted 91:20 cook-offs 47:10 copies 9:14 99:22 copy 10:8 24:9 26:19 54:5,7 correct 30:23 35:8 37:14,15 54:10 60:1,4 66:18 68:3 83:13 89:14,15 90:21 93:23 94:1 101:11 correcting 23:24 corrective 1:5 5:9 14:19</p>	<p>correctly 34:1 37:13 83:14 corrects 23:4 correlate 40:5 52:6 correspondence 43:24 costly 89:10 costs 40:18 cost-effective 89:8 counsel 2:12,12,17 11:17 country 13:13,14 78:11 County 101:2,5 couple 14:18 18:7 35:3,12 43:3 45:15 48:6 65:7 course 65:10 71:7 75:8 85:8,24 86:1 86:12 court 7:3 11:10 cover 49:10 covers 17:16 cracks 74:15,16,17 76:17,17 80:18,21 87:3 95:14,15 96:2 98:9,19,21 create 15:23 17:10 criteria 19:13 22:24 42:3,5 critical 31:3 Csat 23:22 CSR 1:13,14 101:18 curious 67:7 current 15:8 23:13 24:15 25:3 30:3 52:18 77:22 93:20 currently 35:6 currents 81:6 cutoff 59:11 CV 10:12</p> <hr/> <p style="text-align: center;">D</p> <p>d 54:16 60:11 danger 44:3 data 23:20 25:6,9,13 26:1,6,14 32:13 52:20 53:11 83:17 83:18 84:4 89:6 96:7,7 databases 62:14 date 53:3 dates 99:14,14 Davis 2:16 27:15,16 28:10,13,17,20,24 29:17 30:14,24 31:5,19 32:11,23 33:17,20 34:9,16 day 7:17 47:1 99:19 99:20 101:13</p>	<p>days 8:1,5 DCEO 8:1,6,8 DCEO's 8:4 deadline 6:15 99:7,8 99:9,14,14 deadlines 99:5,6 dealing 19:10 24:24 64:9 84:2 86:2 89:23 92:8 93:6 deals 16:11 dealt 93:18 debate 78:7 decade 13:8 decide 64:16 82:19 83:7 98:7 decided 50:10 52:9 decision 36:1 decisions 66:21 deep 39:11 deeper 39:11 default 22:21 37:14 37:23 62:10,13 63:11 74:23 76:11 76:15 85:12 89:1 89:10 92:22 95:7 95:23 96:2 defeat 46:6 defined 15:3 48:12 51:21 55:2 74:23 91:4 definitely 34:11 38:7 definition 46:21 48:4,6,9,10,17 49:15,17 50:13,21 50:22 51:2,10,15 51:22,24 52:10,19 58:12,24 59:12 64:7,11,13 72:1,2 72:10 90:8 definitions 46:20 52:8,12 68:17 degassing 75:12 Degradation 53:14 58:6 62:15 degree 36:11 degrees 52:13,14,19 52:19,20,21 Deirdre 27:21 delay 7:17 92:3 delayed 7:8 delays 93:8 delete 26:4 deleting 24:12 demonstrates 33:14 Demonstration 54:15 Department 7:19,22 69:18 depend 94:17</p>
---	--	---	--	--

<p>depending 7:9 97:5 depends 25:24 85:24 86:13 88:19,20,22 89:6 depth 38:12 54:19 90:16,20 depths 90:17 derived 56:4 describe 26:11 32:24 33:23 43:4 74:21 97:19 described 39:18 57:3 60:19 93:9 describing 16:14 descriptive 62:8 designating 6:5 8:15 9:4,19,22 10:2,7 10:11,14,17,23 11:2,6 designation 47:16 details 18:3,4 85:8 determination 19:5 24:24 25:12 determine 20:2 77:13 84:4 determined 97:20 98:1,14 determining 25:4 56:8 59:12 63:12 develop 28:3 35:22 36:7 82:5 developed 12:24 65:19,20 84:22 developing 14:7 15:7 18:13,14 34:14 35:20 36:2 37:20 63:21 69:4 development 12:16 15:10 54:2 difference 21:17 30:7 52:12 81:16 differences 76:8 79:23 81:3 different 16:19 17:3 20:13 25:23 35:23 39:7 43:4,5 51:8 52:3 64:17 65:9,12 65:14,15 66:5 76:8 81:11 82:6,7,24 83:1,1,2 95:19,21 97:17 99:20 differently 38:5 51:21 difficult 51:10 76:14 83:12,18 84:4 97:4 difficulties 66:22 difficulty 56:7 diffuse 80:20 diffusion 65:18,20 65:21 78:18,22,22</p>	<p>79:7,11,14 80:4,9 80:13 85:19 diffusive 80:4 dimension 77:5 Directive 60:20 directly 40:24 director 27:22 dirt 74:16 81:12,14 81:14 dirt-filled 80:21 disadvantages 83:16 discrete 71:21 discuss 6:15 18:5 discussed 66:12 90:7 discussion 27:4 46:12 49:24 55:12 64:17 75:24 78:12 82:5 99:3,5 discussions 47:2 69:21 distance 38:16 distinct 64:18 distributed 25:6 divide 82:10 division 2:12 11:22 docket 13:18 docketed 5:7 Doctor 91:2 document 10:3 17:20,22 26:20 28:7 56:4,6,7,22 78:9 documents 9:15 56:3 doing 13:5,17 18:1 25:21 63:14 66:24 69:19 done 16:13 34:6,7 40:13,16 63:5 65:8 65:13 66:10,20 83:16 86:5 doubled 37:4 down 61:21 101:9 Dr 3:4,5 5:21 6:8 7:7 7:17 9:7 10:9 12:4 24:18,20 26:13,23 45:23 46:2,16 59:6 59:8,16,24 60:1,4 65:17 68:2,23 69:5 69:14 73:12,17 84:10 90:1,18,24 91:7,18 92:24 93:15,23 94:1,14 94:19 95:4,6,12,16 96:11,23 97:11,14 97:22 98:18 draft 24:14 29:18 72:22 drafted 32:16 drill 98:4</p>	<p>drive 70:13 driving 42:2 drop 52:9 79:1,1,6 dropped 18:18 drywall 19:21 dry-cleaned 77:2 dry-cleaner 19:21 dry-cleaners 77:1 Dsource 38:15 due 22:24 79:16 81:2,3 during 57:15 91:23 Dwyer 2:20 27:23 D1946-90 54:7</p> <hr/> <p style="text-align: center;">E</p> <p>e 2:5 21:22 24:4,5 62:12,15 each 8:21,24 9:2,4 12:23 63:4 74:18 74:21 78:20 83:3 85:21 86:3 87:9 99:13 earlier 42:22 64:6 72:3 85:3,20 89:20 ease 9:3 easier 8:16 41:11 easily 76:10 83:16 East 1:9 2:13,17 easy-to-compare 41:5 EcIS 7:24 8:7 economic 7:20,20,23 7:23 8:2,3 educational 48:15 48:22 effect 31:15 71:12 71:21 73:8 74:10 74:17 75:14 81:21 93:5 effects 25:16 71:1 72:19 73:2 efficient 6:1 effort 79:23 either 21:21 30:20 86:23 87:13 93:13 95:1 elaborate 26:11 45:17 61:1 elevated 77:7 ELUC 21:22 embodied 66:21 86:15 87:5 empirical 79:3 encountered 16:21 17:3 end 6:17 7:16 23:17 31:15 39:14 63:14 63:17 99:19 ended 14:6,12</p>	<p>endless 94:10 ends 41:13 engineering 16:16 enhance 33:1 enjoy 69:22 enjoyable 69:22 enough 34:7 45:12 66:2 enter 9:7 72:15,21 entered 4:2 8:13,21 8:24 9:3 entering 6:4 8:19,22 9:1 70:24 85:4 entire 30:3 87:24 entitled 10:4 24:11 entry 95:10 environment 20:2 environmental 2:8,9 2:11,16,18,23 5:13 7:21 8:23 11:3 12:4 27:13,16 53:14 58:5 62:15 75:22 88:23 envision 67:5 EPA 2:14 16:24 25:20 30:2 60:15 60:21 61:1,7 62:6 EPA's 53:18 equalize 80:5 equation 97:18 equations 16:9 18:17 22:19,21 33:11 equivalence 91:21 errata 9:15,20,23 18:7,8,18,21,22 19:2 20:4 22:13,13 23:4,5,13,21 24:7 24:8,9,10,23 49:19 error 23:24 errors 23:4 essence 47:7 essentially 71:9 74:21 81:9 established 53:20 establishing 13:11 65:24 estate 17:21 35:5 Estep 47:7 estimate 80:7 88:5 88:15 etc 46:6 Ettinger 22:19,21 35:15 40:7 93:11 97:15 evaluate 19:8 32:4 32:14 34:2,12 43:6 70:15 73:9 77:14 82:6,7,11 83:11 84:4,18 96:6,9</p>	<p>evaluated 31:9 77:18 78:4 82:2 89:17 evaluating 56:8 57:4 67:13 78:5 89:18 evaluation 44:11 83:17 84:19 92:13 92:20 93:19 95:21 evaluations 80:23 evaluator 21:14,20 21:24 even 41:18 78:8 81:19 92:3 every 35:5 63:6,10 77:1 everyone 5:4 100:5 everything 84:12 example 21:7 48:20 63:8 80:15 exceed 21:13 exceedance 21:9 exceeds 21:4 except 71:4 exceptional 14:4 exclude 59:1 excluded 42:1,1,5 exclusion 16:13 excuse 47:19 executive 27:22 exhibit 4:3,3,4,4,5,5 4:6,6,7 8:17 9:8,10 9:12,19,21,23 10:1 10:2,6,8,10,11,13 10:14,16,22,24 11:1,2,5,6,8 28:9 28:23,23 90:11 exhibits 4:1 6:6 8:15 9:5 10:18 exist 24:15 37:11 existing 19:14 29:11 30:21 37:24 41:7 41:22 50:23 88:3 expanded 17:14 expect 86:11 expected 7:8 expecting 63:6 experience 69:22 79:3 explain 46:21 52:2 55:23 60:15 explained 51:20 96:5 explains 60:18 explanation 8:4 explicitly 31:8 exposure 5:15,17 12:17 16:2 31:7 48:14,21 53:20 58:21 extent 33:5,6</p>
--	--	--	--	---

F	finding 56:24 fine 20:16 44:23 finite 93:12,17 firm 27:23 first 5:17 8:18 9:18 10:18 12:20,21 13:8 17:9 54:20 69:4 71:22 74:5 76:1 77:13,18 78:18,22 82:11 83:7,9 85:22 86:16 91:19 98:12 fit 69:7 fits 15:18 five 38:19,20 72:6 75:15,21 80:1 81:21 86:4,5 flavor 16:22 flexibilities 44:15 flexible 13:10 floor 74:15 80:17 87:4 floors 76:18 fluctuates 71:7 flush 45:15 flux 80:4 FOC 39:20 focused 15:21 29:5 62:3 67:17 focusing 19:15 follow 23:20 53:6 67:2 68:12 83:13 followed 6:10 following 23:19 29:19 follows 21:3,10 follow-up 7:10 26:10,24 68:8 follow-ups 28:3 footnote 24:3,4,6,6 41:19 60:24 61:7,9 63:4,6 footnotes 41:16,17 forces 65:15 70:13 78:17 91:3,5 foregoing 101:10 forge 7:13 form 57:19 formation 80:23 formula 41:5 forth 55:19 69:16 86:14 96:2 fortunate 13:7 forward 45:21 found 33:5,6 51:7 foundation 80:17 95:15 four 22:14 75:21 81:20 98:10 fourth 12:19 73:2	98:13,16,18 fraction 39:21,22 frame 46:22 47:5 frequency 79:10 95:14 Friedrich 12:2 38:19 fringe 54:24 55:19 55:21,23 56:1 68:18 71:8,10 74:12 76:13 87:1 98:11,12 from 5:12 10:19 13:24 14:22 15:22 16:19 17:11,11 19:17,21 20:3,7,13 22:3 23:2,7,23 24:3,5,9 25:9 31:10,19 38:16 41:3 43:13 45:21 46:14 48:11 51:14 51:15,22 52:10,19 56:5,6 57:10,20 60:13,17 62:19 63:2,8,15 65:9 66:5 70:13,23 72:9 72:17 75:15 76:13 79:3,6,6,19,24 80:8 81:14 83:21 83:23 86:21 88:3 89:4 90:23 91:8 95:10 96:16 front 48:10 89:18 full 71:9 fully 28:4 fund 40:11,12,15 fundamental 69:12 further 13:2 17:15 18:5 19:5 29:2,19 31:11 79:6 future 29:24 30:4 70:23 77:22	gathering 45:14 75:23 gave 25:21 general 2:17 63:16 64:19,20 75:8 82:3 generalized 20:11 generally 31:5 42:1 75:13 76:16 generated 76:22 generic 17:23 92:17 geologic 18:11 37:11 geologist 37:17 geologist's 97:21 geology 37:18 gets 80:8 getting 50:18 51:6 Geving 2:11 9:6,14 11:14,16,17 22:9 24:18 26:19,22 46:18 53:24 54:8 54:12 57:22 59:16 59:24 63:13,24 68:3 Girard 2:4 5:22 64:5,15,24 68:16 give 6:9 8:16 16:22 19:4,4 54:5 56:21 64:17 68:6 69:11 83:2 given 7:17 30:8 37:18 44:15 69:15 77:15 95:7 98:2 gives 82:3 86:10 giving 6:7 go 9:5 12:12 18:3 20:17 21:9 27:2 28:1 29:14 31:15 43:21 46:1,10,19 49:18 51:10 55:5 55:10 59:22 64:6 67:20,23 82:12 83:8,21 85:21 90:24 94:2 96:11 97:12,22 99:2 goals 31:22 goes 69:3 94:11 going 7:15 8:14 9:7 9:9,11 11:19 12:12 16:5 17:7,9,23 26:19 27:6,14 28:1 31:6 32:5 33:21 35:9 36:1 37:8 40:11 42:2,12 45:16 46:15 47:10 48:10 51:9 53:5 60:6 65:2,6,12 66:3,16 67:8,19,24 68:14 70:8 72:6,23 73:18 76:7 77:10 77:23 78:20 94:8	95:16,20 98:20,21 99:6 gone 14:24 19:21 75:22 good 5:3 11:16 33:1 35:18 51:19 70:5 76:11 78:9,9 89:22 governed 6:20 Grand 1:8 2:13 gravel 87:11 gray 12:22 great 70:6 greater 75:9 ground 38:16 50:24 54:19 71:23 75:16 groundwater 15:22 17:12 19:7,12,17 21:5,9 23:3 25:1 26:14 32:13,18 33:18 38:24 41:23 42:10,17,23 43:14 50:24,24 51:3 54:21 55:2 57:14 60:7 63:9 71:13,14 82:18,23 84:21 85:13,15 86:23,24 87:8,22 88:14,15 88:18 95:2 98:9,11 group 2:16,19,23 8:24 11:4 13:22 14:1 27:13,17 60:1 guess 30:11 32:15 36:23 47:21 55:2 guidance 25:18,20 25:22 26:3,10,15 56:3,6 82:9 guidances 66:24 Guide 57:4 guys 41:4 49:14 50:17 51:15 53:5
		G		H
		G 2:4 Gail 8:23 10:24 garage 84:13 garages 84:11 Gary 2:4 3:3 5:22 8:20 10:3 11:23,24 12:10 27:19 gas 14:19 15:22 19:7 21:11,13 23:10,19 33:13,13,24 50:22 54:16,17,19 55:2 65:16 79:10 82:18 86:19 88:10,11,12 88:17 95:1 gasoline 76:22 gathered 13:2	habitation 48:12 hair 12:22 half 30:16,17,20,22 hand 101:12 Handbook 53:14 58:5 62:14 handle 64:23 handled 92:13,18 handling 83:5 Hang 55:3 happen 72:13 78:18 97:6 happened 65:9 happening 71:21 74:2 happens 78:23 79:8 79:13,18 81:11 92:6	

<p>happy 45:8 hard 10:8 38:23 54:5,6 69:24 96:6 96:9 having 17:4,17 41:3 44:7 56:13 62:5 69:15 75:23 82:21 head 59:7 heads 35:3 health 15:23 48:15 48:22 53:21 71:1 71:12 72:18 73:2,7 hear 11:19 65:12 heard 70:11 hearings 12:22 24:22 57:15 HEAST 53:17 61:10 Heather 11:21 held 1:8 27:4 46:12 55:12 99:3 help 29:15 46:6 73:9 helpful 21:1 57:16 62:23 helping 18:1 68:24 helps 60:8 73:23 90:20 her 11:23 hereunto 101:12 Hernando 11:24 12:2 hi 51:19 hierarchy 60:19 high 77:9 79:19,20 79:24 80:1 81:4,8 81:8,12 higher 75:9 79:10 highlight 14:18 him 5:21 69:3,8,9 Hirner 27:21 history 49:6 69:8 78:5 Hodge 2:20 27:23 home 43:10 77:3 homes 17:12 71:11 hope 82:3 hoping 53:2 Hornshaw 3:4 8:20 10:12 12:5 24:18 24:20,21 26:13 45:23 46:2 59:8 hot 60:10 hour 7:11 house 43:13 76:23 77:2 housekeeping 52:24 huge 66:8 77:5 94:9 human 19:8 47:20 77:24 88:4 Hurley 3:4 8:20 10:15 12:3 22:9,11</p>	<p>22:12 23:14,17 51:19 52:3,18,23 57:24 58:8,11,17 58:20 60:10 61:3 61:14,19,23 62:10 62:20 63:3 Hurley's 57:11 hydrocarbons 58:13 hypothetical 30:13 31:3 H-E-A-S-T 53:18</p> <hr/> <p style="text-align: center;">I</p> <p>idea 82:3 ideally 99:24 identification 54:6 identified 16:1 19:19 21:20 31:4 36:16 42:22 67:9 identify 53:23 57:9 IEPA 3:3 58:3 60:13 62:5 69:2 IEPA's 62:17 IERG 20:7 23:7 27:14,17,19,22,24 28:12,24 34:3 66:10 IERG's 32:12 IL 1:16 ILL 1:5 Illinois 1:1,8,9 2:11 2:13,14,16,18,18 2:22,23 5:4,9,13 8:23 10:5 11:3 13:21 16:24 17:10 27:12,16 30:2 35:6 35:13,16 36:12 37:18 60:15,21,24 61:7 62:6 101:1,6 101:7,7 Illinois-specific 35:14,17 36:9 52:15 56:17 imagine 78:13 immediate 11:21 impact 7:20,24 8:2,3 39:13,19 40:14,20 impacted 40:10 70:20 83:21 implementation 13:3 implemented 66:23 imply 77:8 importance 19:19 important 13:20 17:7 19:24 41:17 45:16 72:20 74:6 inadvertently 24:8 include 14:24 51:24 58:23 64:8 95:20</p>	<p>included 15:4 16:1 16:12,14,18 18:12 18:16 29:18 44:15 48:8 49:14 58:15 59:3,9 80:10,15,23 81:23 88:24 includes 58:12,21 including 9:15 31:16 incomplete 20:11 89:12,16 incorporate 57:9,20 incorporated 82:1 incorporations 54:9 56:23 57:6,8 INDEX 3:1 indicate 47:5 indicated 20:10 29:7 55:14 indicates 66:15 individual 26:1 56:15 63:4 74:1 75:23 individuals 48:13 73:1 indoor 5:15 12:16 15:13,17 16:4,23 17:5 21:8 22:16 31:9,16 32:16 33:3 33:9 40:5 41:6 42:6,10 43:5,6,7,8 43:14,17 44:8 48:7 48:19,22,23 49:10 49:12 50:11 52:16 58:20 59:6 66:9 69:10,20 72:22 76:20 77:6,7 82:12 82:14,15,21 83:12 83:19 84:7,15,17 85:10 88:6,9,19 89:3 96:6,12,13,14 96:18 97:24 industrial 82:13 83:20 95:18 industry 76:16 infants 25:16 infinite 39:10 92:9 92:10 93:4,12,21 94:2,7,8,9 inflammatory 15:20 influence 81:19 information 6:21 13:2 29:1 53:7,22 56:17,22 58:4 60:12,17 61:18 62:17,18,21 63:7 63:10 64:2 66:11 66:15 67:6 70:4 87:22 informational 45:13 ingestion 24:3 41:23</p>	<p>48:14 49:2,9 inhalation 5:15 12:17 15:13,17 16:4,23 17:5 21:8 22:16 24:5 31:7,9 31:17 32:17 33:3,9 41:6 42:6,10 43:7 48:8,15,19,22 49:2 49:10 50:8,12 58:21 59:6 66:9 69:10,20 70:17 88:19 89:3 95:23 inhaled 73:1 initial 56:3 initially 13:22 14:21 18:12 ink 79:1,3,5 input 14:4 89:5 inputs 33:12 inside 71:1,11 72:15 72:19,23 73:5,19 73:22 74:17 76:23 77:10,24 78:16 80:3,9,21 81:1 82:13 83:8,22 84:1 84:3 85:23 86:11 87:4 94:20,21 96:12,16 instance 31:10 35:24 66:6 Instances 10:4 instead 62:5 Institute 53:21 institutional 30:11 30:19 42:23 instruct 17:22 instrumental 15:9 instrumentation 83:14 intended 47:20,23 47:23 90:14 intends 30:3 interested 14:11 62:24 99:1 interiors 15:23 interject 90:10 internally 41:4 interrelate 64:18 interrupt 18:20 introduce 11:19 59:23 introduction 70:9 intrusion 10:4 15:15 15:20 17:20 21:5 32:14 57:4 65:11 66:23 76:2 77:21 intrusive 44:4 83:15 investigate 21:14 investigation 22:6 involved 12:23 25:2</p>	<p>68:23 involvement 13:23 14:15 involves 89:16 IRIS 61:10 IRIS/HEAST 60:14 62:5 issuance 17:15 issue 16:22 19:10 56:12 99:11 issued 6:2 17:19 19:5 22:2 29:22 30:19 31:6,8,10 issues 14:13,15 34:4 34:13 43:5 50:10 51:9 69:7,12 77:21 item 7:16 items 6:14,19 36:14 it'd 69:10 it'll 8:15 70:6 i.e 96:7</p> <hr/> <p style="text-align: center;">J</p> <p>J 58:16,17 James 99:18,21 January 1:8 5:2 101:8 JCAR 51:14 Jersey 66:7 Johnson 2:5 5:23 22:19,20 31:21 35:15 40:7 93:10 97:15 Joyce 12:6 Jr 1:9 judgment 76:11 just 7:13 9:11 14:18 15:17 18:20 19:4 19:19 20:7,14,17 21:16 26:9,11 28:1 28:3,8 29:14 30:15 30:24 31:2,5,10,14 31:17 32:5,8,19 33:1,2,5,21 34:1 34:10,21 36:3 38:21,21,22 41:3 41:10,12 44:6,13 44:19,23 45:6 46:2 46:19 47:2,15 48:10 49:14 50:4 51:3 52:24 53:2,4 53:6 55:3 56:18,20 56:24 57:15 58:4 59:16 60:14,21 61:16,17,20 62:2,4 62:22 63:16,19,20 64:5 65:3,6 66:19 67:7 68:5 77:9 79:2,15 83:5 86:5 90:4,4,5,9,15,24</p>
--	--	--	---	---

93:24 98:3 99:4 J&E 32:20 37:21 J&E9a 97:18	69:8 79:2 83:13,22 94:23 97:1,1 known 5:10 24:2 29:23 78:17,17 80:5	light 49:15 like 5:4 7:12 8:9 9:15 19:24 22:9 23:16 24:18 29:6 35:4,14 45:9 47:13 55:6 62:4 68:18 74:19 84:11 86:6 88:12 94:9 100:4 likelihood 29:23 limit 25:9,14 26:2 53:20 limitation 52:1 limited 24:23 50:5 Lin 2:5 5:21 73:11 73:14 lines 62:10 list 53:8 54:1 58:17 61:12 63:16 72:2 listed 16:3 25:9 60:13 76:1 listing 61:15 lists 62:16,22 liter 25:15 little 15:11 20:12,13 28:4 29:5 30:12 32:21 38:5 39:9 60:7,22 61:8 69:11 89:9 Liu 2:9 5:24 51:19 52:11,22 56:20 57:24 58:9 60:10 61:11,17,20 67:2,5 67:10 97:14 live 71:15 living 71:1 72:15 73:4 located 7:2 30:5 74:8 location 29:6,24,24 30:6,7,8 76:13 log 97:21 logs 98:2 long 31:2 34:6 35:8 69:8 79:2 80:6 85:24 97:3 longer 24:15 47:1 look 36:13 44:7 45:20 48:1 49:18 50:7,17 51:8,17 53:24 56:16 57:22 61:13 62:7 63:19 63:24 64:12,23 73:6 82:8 84:11 88:3 98:6 looked 25:17 37:22 45:18 52:3 56:2 looking 15:12 18:21 29:9 32:20,20 49:1 49:2,17,22,23 51:5 63:1 64:7 66:13	67:17 looks 7:12 17:1 51:6 62:4 85:22 87:19 lot 8:16 15:5 42:5 45:16 49:7,24 56:13 69:20,21 70:3,3 77:3 78:9 97:2,3 low 73:21 75:11 79:20,20,24 80:2 81:4,7,13,20,22 lunch 7:11 46:17 55:8 LUST 21:18,19 40:11,12,15	material 37:11 70:22 92:22 materials 6:4 18:11 56:10,19 74:14 mathematically 80:6 Matrix 53:11 matter 1:3 5:8 7:18 8:10 22:5 56:24 96:15 matters 100:3 may 6:23 8:1 10:22 14:9 25:8 45:10 51:12 59:17 63:15 65:10 67:2 70:10 70:20,22 73:11 74:14 77:9 87:14 97:4,5 98:3 maybe 30:12 38:2,3 60:24 64:1,10,12 97:12 McGill 1:9 5:3,6 9:9 9:17 11:13 12:9 18:19 19:1 20:16 20:19,24 22:8 23:12,15 24:17 26:9,18,21 27:2,5 28:8,11,15,18,22 29:13 34:18 35:1 44:18,22 45:2,7,12 45:20,24 46:8,13 48:3 49:4,21 50:9 50:16,20 52:23 54:11,13 55:5,10 55:13 57:7,23 59:19,22 60:9 62:1 63:18 64:4 65:1,4 67:1,4,18,23 68:4 68:7,11,22 73:13 89:24 90:3,9,22 97:8,12 98:15,22 99:4 mean 19:13,24 30:10 31:13,22 33:4 36:3,13 38:22 40:17 41:16 43:21 44:13 47:24 54:21 90:14 94:4 96:4 means 50:22 51:4 54:23 77:17 79:5 94:2 96:24 measure 43:5 76:14 82:14 83:8,10,19 83:22 84:17 96:12 96:18 measured 76:10 83:11 96:8,16,22 measurement 96:7 measuring 83:11 mechanism 80:11,24
K Kara 10:19 Karen 1:13 101:4 KEEFE 1:15 keep 41:3 keeping 62:2,7 key 15:6 93:10 kilograms 94:3 Kim 53:24 Kimberly 2:11 11:14,17 kind 15:14,16 16:10 16:22 17:2 18:4,5 21:17 29:4 31:13 34:13 36:24 41:9 41:10 42:15 44:4 44:14,14 47:11,13 47:16 48:1 56:11 65:6 67:16 69:6 74:1 87:24 90:6 kinds 61:12 King 3:3 8:20 10:3 11:23 12:10,10 18:24 19:2 20:18 20:21 21:2 27:19 30:10,23 31:2,12 32:2,19 33:4,19 34:6,11 35:8,18 36:20 37:4,15,19 38:7,14,20 39:4,8 39:17,22 40:2,8,16 41:8,15 42:4,12,21 43:19 44:12 45:22 46:20,24 47:19 49:1,16 50:7,15,19 50:21 51:5,18 54:14,23 55:3,7,23 56:2,18,23 57:3 64:14,22 65:3,5 67:8,11 68:5,9,14 68:23 69:17 84:9 90:3,4,12 knew 46:24 57:17 know 9:7 14:11,13 19:18 29:10 30:15 30:16,19,20 32:2 35:13 36:18,22 37:6,18 38:21 39:12 41:12,15 42:15,18 43:10,22 44:8 45:17,18 47:1 47:4,6,7,11,23 49:6 51:1,4,5 53:4 55:24 56:10 61:22 63:21 64:7,17 65:12 67:11 68:16	L L 2:4 21:22 23:22 Land 1:5 11:18,24 61:5 language 23:10,11 26:5 29:18 31:23 32:2,4 34:4 49:8 49:24 54:17 62:8 63:20 64:16 large 79:21 92:1,10 93:4 larger 56:14 Larry 47:7 last 12:6 17:19 20:9 24:10 33:21 44:14 53:19 54:4 60:2 69:19 75:21 87:7 96:4 late 51:16 later 8:16 9:3 38:3 57:2 60:23 65:17 99:23 law 2:21 27:23 80:7 80:7 layer 55:19 98:9,10 98:12,14 layers 97:17,20,23 98:7,8,10 lead 5:23 27:14 leak 76:21 leaking 12:1 learned 7:7 least 8:5 12:6 35:13 39:9 44:10 54:19 63:7 left 5:21 legal 2:12 25:2,12 length 12:12 37:4 less 63:19 79:22 let 15:11 27:14 39:17 64:5 79:2 83:4 90:9 97:22 letter 17:16 21:6 22:1,2 29:19,22 30:2,8,18,18 31:24 66:14 letters 29:2,3 31:6,7 31:11 let's 33:5 70:16 95:17 level 88:2 levels 87:23 liability 17:15 22:3 License 1:14	M M 2:16 24:11 36:6 36:14 38:15 made 10:21 12:24 15:6 18:11 20:3 35:12,14 37:10 40:3 66:20 69:5 94:17 Magyar 10:19 mailbox 99:11 main 57:12 70:9 major 12:14 78:6 make 6:1 7:10 8:3 8:15 9:11 10:5 13:15 18:16,20 19:15 33:21 35:12 35:16 36:1 45:22 45:23 47:9,11 51:3 64:1 65:5 69:16 71:15 89:11,15 90:6 93:24 makes 30:7 65:21 75:24 83:18 84:3 84:18 making 13:8 31:13 41:10 62:7 management 11:23 12:7 16:4 89:14 manager 12:1,2,5,6 24:21 managing 17:1 mandating 32:6 many 7:10 25:23 38:17 58:12 69:3 76:1,3,9,20 78:10 84:15,15,23 89:5 97:23 98:7 March 5:18 17:19 45:11,18 99:9,10 99:17,20 Martin 15:7 20:9 27:19 Maryland 19:20 mass 79:19 94:10		

<p>mechanisms 89:13 media 37:12 38:13 74:11,17,18,21 95:14 meet 89:1 meetings 14:14 meets 19:13 21:11 59:12 82:15 member 2:4,5,5 5:21,22,23 27:7,19 31:21 68:15 73:11 73:14 members 2:3,7 90:23 memory 29:16 mention 10:18 mentioned 6:19 27:20 49:13 69:17 86:20 89:20 mercury 77:20 merits 62:7 metals 77:20 meters 36:21,21 37:5,5 method 59:9,10 methodology 5:16 17:4,9 34:3 70:1 82:6 methods 70:15 82:10 89:11 metric 38:21,23 mid 69:5 middle 79:1 might 7:17 20:24 21:7,8,9 29:15 46:7 60:21,23 61:1 61:8 65:11 70:23 79:9 80:19 91:11 91:12 migrate 71:10 72:4 72:8 74:12,14 87:1 87:16 91:8 92:15 97:18 migrating 17:11 72:17 91:23 migration 32:17 72:11 74:4,18 76:2 78:2 81:2 85:4 86:21 87:2 91:4,10 milligrams 25:15 minimum 46:23 minor 42:19 Miss 51:19 56:20 57:24 58:11 60:10 62:10 mix 72:21,24 mixed 94:20,23 95:8 mixing 72:23 73:14 85:5 87:4 94:16,19 95:23</p>	<p>model 32:20 35:15 37:21 39:10 40:7 84:22 85:1,2,8,10 85:18,22 86:15,17 87:17 88:1,7 91:17 93:11,12,16 94:17 97:15 modeling 32:13,17 33:2,9,16 43:17 models 32:21 model's 39:10 modified 78:8 95:24 modifiers 49:3 moisture 71:9 87:13 87:20 88:14 molecular 79:16 molecules 78:15 79:5,8,17,22,22 moment 27:3 46:11 55:6,11 Monica 2:21 27:22 monitoring 26:14 33:13 98:3 monopolize 96:5 months 46:22 47:15 47:18,21,24 more 15:14 17:14 20:12 25:7 28:4 38:1 41:5,21 44:6 45:13 47:21,24 50:5 52:16 58:10 62:8 63:20 65:22 67:8 73:16 75:20 76:14 79:11 89:9 92:8 97:12 morning 5:3 7:7 11:16 51:19 most 12:15 39:15 42:3,4,7,11 43:8 48:9 52:19 61:3 78:6 mostly 29:5 motion 57:9,20 move 8:11 19:17 65:16 70:12,13 78:13 79:19,24 82:4 91:12 movement 15:21 81:3,5 91:3,14 92:4,4 93:7 moving 31:19 92:6,7 much 39:12 40:20 56:14 69:14,17 75:17 80:8 85:7 87:19,20,21 97:14 multiple 32:7 Munie 12:6 must 8:3 21:14,21 72:14 95:13 m-Xylene 23:23</p>	<p style="text-align: center;">N</p> <p>N 97:16 name 5:5 11:17 22:11 24:20 27:9 34:21 91:1 name's 12:10 27:15 Nancy 97:16 naphthalene 58:21 59:9 National 53:21 nationwide 56:19 natural 72:22,22 nature 44:4 45:14 79:22 near 11:19 necessarily 19:14 43:13 77:8 necessary 65:24 89:7 92:8,19 need 17:4 21:24 26:19 35:12 43:1 54:1 77:14,18 100:3 needed 14:23 15:3 20:11 35:21 needs 16:23 45:18 48:7 negative 43:15,22 96:7 negatives 46:5 neglect 81:24 negotiate 21:21 new 22:15,17,18,19 23:2 26:3 31:6 35:5 41:5 48:7 51:21,23 60:19 66:6,7,14 67:5,12 70:17 next 5:21 8:21 10:7 10:10,13 11:23,24 12:2,3,4 25:13 39:20 53:11,11,13 53:13,17 55:16,17 68:19 72:20 78:12 78:19 82:5 99:19 NFR 21:6 22:1,1 29:2,22 30:2,8,18 30:18 31:6,24 66:14 Nifong 11:22 nitrate 25:11,14 nitty-gritty 85:7 none 7:15 8:18,21 8:24 9:2,21,24 10:5,9,13,15 11:1 11:4,7 46:10 79:16 97:9 98:24 100:4 nontoxic 73:15 non-degrading 93:6 non-detect 25:7</p>	<p>noon 7:9 normally 7:16 15:16 25:6 94:9 north 1:8,15 2:13 30:16,22 Notarial 101:13 Notary 101:4,18 note 62:12 63:14,16 noted 36:9 noting 26:1 number 3:2 4:2 6:6 6:14 8:17 9:16,20 9:23 10:22 18:22 19:2 22:13,13 23:7 23:13,21 36:10,11 40:12 53:1,13 61:21 65:23 66:6,8 76:16 79:21 97:17 97:19 numbers 16:8 33:8 33:10,14 36:2 56:4 56:5,9 63:1,8 65:19 93:20 numerous 82:9 83:18</p> <p style="text-align: center;">O</p> <p>objection 8:18,21 9:1,19,22 10:1,7 10:10,14,23 11:2,5 objections 8:12 objective 22:18 88:12 90:13 objectives 1:5 5:9,16 12:18 13:11 14:19 15:1 17:18 21:5,11 21:14 22:16,23 35:22 48:19 54:16 54:18 65:21 69:7 95:1 obvious 43:7 96:14 obviously 73:4 85:1 89:1 occupancy 46:23 47:21,24 occupants 15:24 30:4 Occupational 53:21 occupies 47:18 occur 81:18 87:8 occurred 25:11 occurs 79:15 81:3 87:18 94:16 ocean 81:6 October 6:2 8:6 off 19:23 27:2,4 46:10,12 53:5 55:5 55:10,12 56:18 67:20 99:2,3,5 Office 26:15</p>	<p>officer 1:9 5:3,6 9:6 9:9,17 11:13 12:9 18:19 19:1 20:16 20:19,24 22:8 23:12,15 24:17 26:9,18,21 27:2,5 28:8,11,15,18,22 29:13 34:18 35:1 44:18,22 45:2,7,12 45:20,24 46:8,13 48:3 49:4,21 50:9 50:16,20 52:23 54:11,13 55:5,10 55:13 57:7,23 59:19,22 60:9 62:1 63:18 64:4 65:1,4 67:1,4,18,23 68:4 68:7,11,22 73:13 89:24 90:3,9,22 97:8,12 98:15,22 99:4,11 off-site 19:9 21:10 21:15,20 22:3,5 32:14 oftentimes 84:2 oh 14:13 58:19 98:18 okay 8:18 9:18 10:1 19:1,12 20:18 21:2 21:10 22:11 23:15 23:17 28:10,22 30:24 31:5,19 37:23 40:3 42:5 45:12 46:18 48:2 50:19 51:18 54:12 55:1,9 56:20 57:1 57:3 58:9,19 59:14 60:8 61:19,23 63:24 64:14,22 65:9,18 67:10 68:11 85:6 95:5 old 24:14 38:22 older 41:24 omitted 24:9 once 31:15 51:7 72:3 72:20 83:17 one 7:5,15 8:4 12:14 14:18,22 18:20 20:6 22:15 24:23 31:22 35:20,24 37:19 39:17,20 40:9 41:8 42:22 45:4,22,23 47:2 51:12 52:13 53:12 54:8 55:8,11 57:5 58:7,10 60:5 61:5 62:6 65:5,14 66:10 68:13 71:22 74:3 76:13 77:18 78:18 78:19,22 81:12</p>
--	---	---	---	--

<p>82:11 84:5 91:5,10 91:22 93:9,11 95:9 97:10 98:10 ones 74:22 87:15 89:8 ongoing 63:10 online 62:14 only 16:21 21:24 58:7,22 66:12 76:3 77:20 81:23 84:11 90:15 92:3 98:19 98:21 onto 87:17 on-site 21:24 22:4 29:21 open 26:24 27:6 34:12 46:5 74:16 opening 20:6 23:18 opinion 49:13 opportunities 16:12 opportunity 7:20,23 12:11 27:18 48:13 48:21 opposed 36:10 38:6 45:4 50:3 52:20 option 43:20 options 93:14 order 5:14 6:2 28:2 99:11 ordinance 42:23 ordinances 42:10,17 organic 39:21,22 74:20 93:2 organization 27:10 34:21 44:20 original 25:19 38:6 45:1,5 49:12 93:15 originating 82:24 OSWER 60:20 other 13:12 15:5 16:5,13,17 17:13 18:14 21:12 22:23 31:9 35:4,16,23 41:22 42:9,16 43:15,16 44:15 45:22,23 46:14 52:14 60:5 65:5,9 65:20 66:6,16,22 74:6 75:1,20 76:19 77:20 78:16 80:11 80:24 81:23 82:17 82:20 84:24 86:4 89:13 90:17 91:5 91:11 98:23 100:3 others 29:15 89:9 Otherwise 6:18 out 14:8,21 16:8 18:4 19:20 21:18 33:5 42:11,13 43:7 45:15 46:2 56:14</p>	<p>60:1 66:20 67:6 70:4,15 94:11 outdated 25:22 outdoor 24:5 48:16 49:11 outlined 34:5,13 outside 16:11 72:16 81:13 84:12 over 7:5 12:7 13:8 14:3 30:20 36:18 56:10,10 69:23 71:8 79:1,3,17 87:7,10 overall 61:2 overlap 64:19 overly 66:3 overlying 30:9 own 44:8,19,22 83:3 owner 67:12 owners 17:13</p> <hr/> <p style="text-align: center;">P</p> <hr/> <p>P 3:3 page 3:2 29:10 33:23 51:20 53:8 53:15,19 58:1,11 60:15 62:12 pages 28:6 57:11 paid 49:8 panel 3:3 6:12 11:20 35:4 papers 82:9 paragraph 23:18 parameter 23:1 38:14 53:10 58:2 97:16 parameters 22:20 22:22 35:24 36:7 37:20 38:5 45:15 60:13 62:11,13,16 62:19 63:12 85:11 88:21,23,23 89:5 parentheses 60:14 part 12:17 17:21 18:1 19:6 20:5 24:12,13 40:17 50:17 57:15 59:8 62:3 70:12 73:10 78:12 82:5 89:18 91:3 98:19 participate 27:18 participation 100:5 particle 87:10,11 particles 87:12,12 particular 50:12 69:19 72:7 81:15 95:2 97:5 98:8 particularly 42:14 44:5 partition 88:14</p>	<p>parts 78:10 party 25:3,8 past 25:17 pathway 15:21 16:12 17:16 21:5 32:14,17 33:10 35:4,5 41:1,23 42:2,6,10,11,24 43:7 48:8 50:12 69:2,10,13,20 70:1 70:4,10,15,16,17 70:17 71:3,20 74:11 75:1,20,24 76:18 77:6,14,15 77:16,17 78:3,6 81:17 82:4,7,12 85:18 89:3,6,12,14 89:15,18,23 pathways 16:5,13 16:17 21:12 22:23 31:16 32:7 35:23 75:5,20 patience 69:15 PCE 19:20,23 76:23 pending 57:10 people 14:2,10 38:3 42:15,23 45:4 56:13 61:8 71:1,15 72:19 73:4 89:8 people's 35:3 per 25:15 percent 25:7 55:21 Perfect 9:17 performing 22:5 perhaps 63:14,17 78:8 period 47:12 78:1 permanency 47:6 permanent 47:14 permeability 74:20 permissible 30:22 permitting 6:13 person 43:10 86:1 persons 50:3,6 petroleum 40:18 phenomena 75:13 78:17 79:7,14,18 80:6,10 81:15 phenomenon 92:17 phone 61:21 phrased 15:13 30:12 physical 23:1 52:4,4 53:9 62:11,13,16 PhysProp 53:12 pick 36:3 37:7 picked 37:6 picture 87:9 piece 35:5 87:11 pieces 74:1 Pier 53:16</p>	<p>place 13:16 66:14 81:13 91:22 places 17:13 planning 31:12 66:13 please 7:4,5 11:10 22:10 46:21 55:23 56:21 58:5,14 59:20 97:19 100:1 plus 65:21 PNAs 58:22,23 59:4 point 8:17 11:9 12:22 26:17 27:5 31:12 33:21 34:19 40:22 41:16 43:7 46:2,14 49:20 51:23 52:1,5,9 59:11,17 65:2 66:19 67:19 68:1 72:9 90:6 91:22 pointed 98:16 points 43:3 93:11 policies 66:23 pollutants 84:7 Pollution 1:1,8 5:4 101:7 polynuclear 58:13 populations 40:10 42:15 porosity 39:19 55:22 74:19 80:13 portion 24:23 26:8 29:12 30:9 portions 57:17,20 pose 46:15 posed 66:10 68:16 position 7:12 positive 43:11 positives 43:9 44:4 46:3 96:10 possible 6:1 60:23 potential 6:15 19:6 44:2 46:3,4 73:1,7 potentially 40:13 68:12 71:12 73:5 PPRTVs 53:17 61:10 practical 70:2,5 76:15 89:21 practicality 89:23 practice 17:20,22 predicted 40:6 43:17 preexisting 41:1 preferential 75:5 prefile 7:1 prefiled 6:3,3,3,7,15 8:12,12,19,22 9:2 9:21,24 10:2,11,15 10:17,20,24 11:3,6</p>	<p>20:8,14 23:6 24:7 28:7,12,13 33:22 51:20 53:2,8,15 57:11 58:1 60:16 60:18 99:8,9,10 prefiling 99:6 prefilings 9:4 prepared 14:24 20:12 preparing 23:8 prescriptive 25:4,10 25:21 26:4 presence 77:19,21 present 2:3,7 5:20 6:9 11:21 12:11 19:7 43:16 60:7 69:9 77:16 101:6 presentation 6:9 9:10 10:9 11:10,15 22:7 68:1,10 90:10 97:15 presentations 69:5 presented 20:8 28:2 press 15:15 pressure 51:23 75:11,11,13 81:3,4 81:5,7,8,9,12,13 81:16,19,20,22 presumably 21:9 presumed 31:17 pretty 36:15 42:19 prevents 72:17 78:2 previous 51:22 95:17 previously 31:10 primary 22:14 40:10 79:18 Print 41:13 prior 20:20,22 24:22 privileged 6:22 probably 45:17 46:17 48:9 49:6 84:13 problem 25:1,11 40:19 46:3,4,4 66:16 67:7,9,14,16 77:8,20 82:23 83:17 84:5 96:15 96:19 problems 43:8,9 procedural 6:14,19 6:21 7:15 54:3 100:1 procedure 32:5 83:15 procedures 7:14 25:9,23 26:3 proceed 11:9 22:10 24:19 45:8 55:16 67:24</p>
---	--	--	--	--

<p>proceeding 5:7 6:20 7:4 13:5 14:6 26:8 57:10,19</p> <p>Proceedings 1:8 5:1</p> <p>process 17:24 18:2 18:13 34:7 72:13 73:24 81:10,18 85:19 91:23 95:19</p> <p>processes 78:21</p> <p>produce 8:2</p> <p>products 77:4</p> <p>professional 14:4 76:11 97:21</p> <p>professionals 75:23</p> <p>program 21:18,19 21:19,23 22:2 70:6 70:19 93:16</p> <p>programs 11:22 16:24 22:4 35:9 51:8</p> <p>progress 7:9 26:16</p> <p>project 12:2,7</p> <p>projected 41:6</p> <p>properly 36:24</p> <p>properties 52:5 74:19 86:8,8 88:13</p> <p>property 17:18 21:4 21:12 30:11 31:22 48:4,11,12,18 50:13 52:4</p> <p>proposal 5:12 8:8 12:13,14 13:7,17 14:5,8,17,21 15:7 15:10,12 16:3 18:4 18:8,14 24:15 45:5 45:14 48:5 49:15 50:1 54:4 62:3 65:8 69:1 88:17</p> <p>Proposals 23:19</p> <p>proposed 1:4 5:8 7:24 8:3 14:5 23:2 41:1 50:22 54:17 57:14 63:22 64:16 74:24 80:10 81:24 83:6</p> <p>proposes 5:14 18:8 60:12</p> <p>proposing 17:6 18:17 19:3 23:5 66:9</p> <p>pros 83:3</p> <p>protecting 17:10</p> <p>Protection 2:11 5:13 7:21</p> <p>protective 85:17</p> <p>protectiveness 19:9</p> <p>protocols 83:13</p> <p>provide 29:1,18 34:3 45:9 53:3,6 53:22 54:6 55:14</p>	<p>57:2</p> <p>provided 14:3 57:13 63:10</p> <p>provision 18:15 49:6</p> <p>Provisional 53:16</p> <p>public 8:5,5 10:20 10:22 27:7 101:4 101:18</p> <p>publication 78:6</p> <p>publications 82:10</p> <p>publicly 84:23</p> <p>published 58:6</p> <p>pull 34:24</p> <p>pulls 81:13,14</p> <p>pump 46:5</p> <p>purpose 20:4 69:13</p> <p>purposes 30:1,2 36:2 68:18 94:24</p> <p>push 81:9</p> <p>put 16:9,20 18:11 32:2 41:9 51:2 61:6,7,9,20 63:6 64:11,16 68:24 70:1 79:1,6 83:14 99:10</p> <p>putting 51:7,13</p> <p>p-Dichlorobenzene 24:2</p> <p>P-H-Y-S 53:12</p> <p>P-R-O-P 53:12</p> <hr/> <p style="text-align: center;">Q</p> <hr/> <p>Qsoil 24:11</p> <p>qualify 21:6 22:1</p> <p>quality 40:6 43:6,18</p> <p>question 10:18,20 10:21 20:8,14,22 21:1,2,3 23:7,7 27:8 29:14,17 30:5 30:12 32:12,12,15 32:22 35:18 38:2,3 48:3,17 49:9 51:2 52:24 54:14,20 55:15,16,17 58:1 60:2 62:9 64:9 67:2 68:13,16,21 71:12 73:11 76:12 77:24 90:5 94:23 95:17 96:1 97:10 97:23</p> <p>questions 6:3,10,24 7:10,14 8:13,17,22 10:17,24 11:3 14:13 18:6 20:6 27:1,6,12,13,14 28:2,4,6,12,21,24 29:4,5 33:22 34:20 35:3 46:9,14,15 48:6 49:17 66:10</p>	<p>85:9 90:1,23 97:9 98:23 99:9,24</p> <p>quick 26:9</p> <p>quickly 48:11</p> <p>quite 15:19,19 40:22 64:9</p> <p>quote 93:10,11</p> <hr/> <p style="text-align: center;">R</p> <hr/> <p>R 1:9 99:18,21</p> <p>radiate 70:23</p> <p>raised 49:18</p> <p>RAM 60:1</p> <p>range 25:15 56:10</p> <p>Rao 2:8 5:24 18:23 46:19 47:17 48:2 50:21 51:12 54:14 55:1,4,9,17 56:16 56:20 57:1 58:10 58:19 59:3,14 60:8 62:9,23 63:5,23 64:3</p> <p>Rao's 55:15 68:13</p> <p>rare 93:18</p> <p>rate 92:18,21</p> <p>rates 53:14 58:6 62:15 95:19,22</p> <p>rather 10:20 18:3 68:15 82:20 83:16</p> <p>rationale 46:22 50:3 55:24</p> <p>rattle 53:5</p> <p>Raymond 34:23 91:2</p> <p>RCRA 26:15</p> <p>reach 19:8 36:7,14 47:14 56:11</p> <p>reached 93:8 94:12 94:14</p> <p>react 73:19</p> <p>reaction 73:15,22</p> <p>reactions 73:20</p> <p>read 6:5 8:14,19,22 9:1 19:4 20:14,17 20:22 21:1 23:11 29:15 41:14,19 48:10 65:12</p> <p>reading 51:4 60:17 65:10</p> <p>readings 40:6</p> <p>real 13:19 17:21 35:5 48:12 69:12</p> <p>realize 34:9</p> <p>realized 18:15 23:8</p> <p>Realizing 25:17</p> <p>really 12:14 14:1,16 14:23 15:6,6,9,20 16:6 17:2,4 18:1 18:16 28:4 36:13 40:1 45:15 51:9,16</p>	<p>52:6 56:9,11,13 65:13 66:11 68:16 68:18 69:22 77:14 85:2 92:16 93:17 94:4</p> <p>reason 16:20 25:1 52:14,17 59:3,8 67:13 84:6 92:15</p> <p>reasonable 37:8 47:5 91:24</p> <p>reasonably 38:11</p> <p>reasons 22:14 51:13 61:6 81:23 96:6</p> <p>recall 34:1 45:2 90:12 92:9</p> <p>receive 54:9 99:13</p> <p>received 5:12 15:2 20:6 23:7 54:4</p> <p>recent 78:6</p> <p>recently 19:19 63:8</p> <p>receptors 19:8 77:24</p> <p>recess 67:22</p> <p>recognize 20:1</p> <p>recognizes 70:2</p> <p>recommendation 68:20</p> <p>recommended 53:20</p> <p>recommending 26:4</p> <p>reconsider 62:2</p> <p>reconstruct 41:4</p> <p>record 6:5,23 8:14 20:15 27:3,4 28:9 46:1,11,12 55:6,11 55:12 57:17,18 60:18 63:7,11,21 67:21,24 90:5 99:2 99:3,5 101:8</p> <p>recreational 48:16 48:24 49:11,12</p> <p>reduce 66:21 79:23 92:4</p> <p>reduces 91:14</p> <p>refer 20:7 24:13 31:8 53:15,19 61:7 72:10</p> <p>reference 49:11 50:2 52:1 56:24 57:6,8,12 60:21 63:4</p> <p>referenced 32:10 52:13 53:1 61:6</p> <p>references 24:12 51:22 78:10</p> <p>referred 15:17 26:10 32:24</p> <p>referring 26:12 28:11,15 52:11 98:17</p> <p>reflect 35:15,17</p>	<p>reflected 36:4 50:11 91:17</p> <p>reflects 60:19</p> <p>refresh 29:16</p> <p>regard 68:9</p> <p>regarding 8:9 29:1 62:10 68:8</p> <p>regardless 30:4 35:6</p> <p>regards 15:9 69:6</p> <p>regime 31:7</p> <p>regulated 14:2 62:24</p> <p>regulations 14:2 88:3</p> <p>regulatory 2:16,18 2:23 8:23 11:4 27:13,17 54:2</p> <p>REL 53:20</p> <p>related 65:11,15 66:11 69:12,20</p> <p>relationship 86:10 86:13</p> <p>relative 13:2,3,20 14:19 15:2 16:16 16:23 17:21 30:6 32:15 33:9 40:21 67:15 69:2,9 94:6 94:10</p> <p>relatively 83:14</p> <p>release 22:3</p> <p>relevant 6:21 57:18 92:11 93:7 98:19</p> <p>relief 17:15</p> <p>relook 66:8,17</p> <p>rely 76:10</p> <p>remains 6:17 34:2 99:19</p> <p>remedial 12:7 88:11 95:1</p> <p>remediate 21:24</p> <p>remediation 5:16 11:22 12:18 13:11 13:22 15:8 17:14 17:16,17 19:5 21:4 21:7,11,13,19,23 22:2,15,17,23 27:20 29:3,19 31:11 32:3 35:22 40:18,21 47:3,8 48:19 54:16,17</p> <p>remember 37:13</p> <p>removed 78:9</p> <p>removing 18:9</p> <p>rental 47:17</p> <p>reopening 66:8,13 66:17</p> <p>Reott 34:23,23 35:2 35:11 36:17 37:2 37:10,16 38:1,12 39:2,5,14,21,24</p>
--	--	--	---	--

<p>40:3,9,23 41:13 42:3,8,14 43:3 44:10,17,18,21,24 45:3,10,13 66:18 91:2,2,16 92:21 93:9,20,24 94:12 94:16,24 95:5,9,13 96:4,21 Reott's 65:6 repetition 70:10 repetitious 6:22 replace 26:5 replacing 20:19,21 report 19:20 Reported 1:13 reporter 7:3 11:10 101:5 REPORTING 1:15 reports 54:2 representative 96:22,24 97:4 represented 47:14 representing 27:11 34:22 44:20 request 7:19,22 8:2 8:7,8 32:3 64:23 requested 14:9 requests 51:14 require 30:19 32:13 32:17 required 33:2,3,9,16 84:20 requirement 18:10 requires 7:22 56:9 82:1 requiring 6:2 89:8 reserved 6:16 residence 37:1 71:17 residences 44:6 residential 36:20,22 48:4,11,18,19 50:13 71:17 82:14 residents 17:8,10 resort 44:14 respond 68:15,20 responded 8:8 10:19 responding 6:11 response 8:11 20:10 20:12 23:6,8 29:8 29:9 30:1,7 32:23 33:17 55:14 60:3 88:5 99:1 responses 8:13 9:2 9:24 11:6 18:6 20:9 28:16,19,20 68:13 responsible 25:3,8 restate 29:14 90:24 restrictive 42:3,4,7 42:11</p>	<p>result 25:14 43:11 67:6 resulted 14:16 43:9 results 33:24 43:14 46:6 58:3 retard 91:3,13 retardation 91:23 92:3,5,6 93:1,3,5,7 review 7:6 14:9 Reviews 53:16 revise 60:12 revised 53:9 58:2 revisions 57:12 revisit 50:10 revisited 49:15 Richard 1:9 5:6 Rick 57:9,13 right 5:23 7:18 11:18,21 18:21 28:17 29:14 32:11 34:16 35:7,11 42:4 49:4 50:15 61:23 63:19 70:18 84:14 90:18 95:4,12 96:11,17,23 Rios 2:21 27:22 risk 10:4 69:7 72:7 85:6 88:2 89:14 risks 15:23 risk-based 5:15 17:23 Roland 2:22 room 6:16 7:3 99:17 99:20,21 ROs 21:8 88:16 route 5:15 12:17 16:2,4 22:16 31:7 31:9 58:21 routes 5:17 RPR 1:13 rule 12:20 13:9 17:6 35:20 37:24 40:10 42:19 51:3,4 63:20 64:21 65:7 66:19 72:1 74:23,24 80:10 83:6 84:16 84:21 85:12 89:12 89:20,21 96:3 99:12 rulemaking 1:5 5:7 5:12 8:7 45:1,5 49:12 51:16 57:16 57:21 63:9 99:16 100:1 rules 5:14 6:21 7:24 8:1,3 12:24 15:14 15:18 16:10 19:13 23:9 24:14 31:15 41:24 44:16 52:9 54:3 63:1 69:4</p>	<p>73:8 80:15 81:24 rule's 41:3 R08-18 57:10,18,20 R09-9 1:4 5:7 R26 32:20,24 R97-11 49:7,23 R97-12 49:7</p> <hr/> <p style="text-align: center;">S</p> <p>safe 19:14 20:3 30:3 71:15 82:20 safety 19:8 53:21 Salhotra 3:5 6:8 7:7 10:9 26:23 46:16 59:6,16,24 60:1,4 65:17 68:2,23 69:5 69:14 73:12,17 84:10 90:1,18,24 91:7,18 92:24 93:15,23 94:1,14 94:19 95:4,6,12,16 96:11,23 97:11,14 97:22 98:18 Salhotra's 7:17 9:7 same 30:1,2 33:18 41:7,10 52:11 55:1 62:10 76:20,23 79:13 101:9 sample 25:13 33:24 samples 23:10 25:6 34:1 82:12,18 98:5 sampling 44:5 sand 37:13,23 40:1 80:19,20 87:11 92:22,24 93:2 98:12 saturated 54:20,21 64:10,13 68:17 71:6,6 saw 19:19 36:18 saying 59:7 says 19:5 49:1 85:23 SCDM 53:11 scheduled 5:18 99:17 science 13:3 38:1,3 scientific 69:12 70:3 Scientist 2:8,9 screen 16:8 screening 33:10 Seal 101:13 seat 60:11 sec 18:20 second 6:16 12:17 13:19 18:18 31:21 55:3 66:5 70:12 71:3 72:8,13 78:19 86:18 96:1 98:13 99:7,16 Secondly 17:13</p>	<p>section 7:21 12:1,7 18:9 19:3 23:6,9 23:18,20 25:5 26:5 46:19,19 48:9,11 54:3,15 55:18,18 sections 24:13,14 see 15:15 34:19 36:24 40:14 59:6 63:1 64:1 66:6 69:1 70:6 73:7 80:16 82:15 97:22 98:5 seeing 7:15 8:11,18 8:20,24 9:2,21,24 10:5,9,13,15,24 11:4,7 40:17 46:10 46:13 73:8 97:9 98:24 99:1 100:4 seek 48:5 seem 54:4 seemed 35:11 43:8 seems 40:9 seen 13:12 70:11 semi-volatile 52:7 semi-volatiles 59:11 Senior 2:8 sense 18:16 43:9,12 sensitivity 39:9,16 sent 8:6 14:8 sentence 23:19 separate 32:21 41:2 41:20 95:21 separation 31:13 September 5:11 sequence 88:1 series 14:14 seriously 13:24 14:1 set 12:21 13:8,9,21 15:3 16:9 25:6,9 26:1,6 31:10,14 32:5 41:10,24 47:9 47:12 56:9 95:13 101:12 sets 25:13 55:18 setting 37:3 55:24 95:18,24 99:5 seven 16:19 40:4 several 49:5 52:3 62:14 69:18 74:5 shaking 59:6 sheet 7:2 9:20,23 18:21,22 22:13,13 23:4,5,13,21 24:8 24:9,23 sheets 9:15 short 47:12 55:15 shorthand 101:5,9 show 10:8 39:5 41:5 43:12,15 97:21 shown 25:16 46:16</p>	<p>70:17 87:8 shows 17:2,3,4 Shundar 2:5 5:21 side 15:13 52:12,12 71:21 signal 27:8 significant 65:7 significant 12:15 14:16 15:1 40:19 42:21 65:14 66:19 66:20 sign-up 7:2 similar 16:5,15 21:16 32:8 71:4 simple 40:8 60:20 89:4,11 simplify 60:16 simply 10:22 60:14 60:16 simulates 85:2,10 since 9:12 12:20 50:12 58:6 single 51:10 Sir 34:20 sit 79:2 site 13:22 15:8 17:1 17:13 19:13,21,22 21:6,7,11,14,18,20 21:23,23 22:2,3,5 27:20 29:12,22 30:3,9,15,16,17 31:15 44:7 47:3,8 56:15 61:5,5,8,11 61:16 62:18,21,22 66:11,13 67:13,17 77:15,18,19 84:20 98:2,2,14 99:23 sites 10:4 12:3 16:19 17:2 40:12,21 42:9 42:15 45:16 66:8 66:17 site-by-site 51:9 56:8 site-specific 33:12 39:6 66:15 67:6 76:9 84:17,19 89:2 92:16,19 sitting 11:18 70:21 situation 67:9,12,16 70:19 71:16 82:1,6 82:20 92:2 93:5,6 93:18 95:17 97:5,6 situations 16:11 41:21,22 78:3 six 46:22 47:15,21 47:24 71:20 73:9 73:23 75:15 85:2 85:10,20 89:4 sixth 86:4 size 36:1,3,8,17,19</p>
---	---	---	--	---

<p>36:20,22 37:1,6,7 75:4 76:17 89:22 94:18 95:3,6,22 slab-on-grade 87:3 slide 6:9 10:8 68:1 90:7,10 96:24 97:23 slides 9:8 78:20 93:9 slow 91:9 92:3 slower 79:10 slowly 7:4 small 24:23 26:8 41:13 60:6 81:19 90:6 94:21 smaller 15:5 37:6 smokes 76:23 software 53:13 soil 14:19 15:22,22 17:12 19:7,7,12,17 21:11,13 23:10,19 32:18 33:6,13,13 33:24 38:17 39:19 43:14 48:14 49:2,9 50:21,23 54:15,17 54:18 55:2,22 65:16 70:12,19,24 71:6 74:16 76:7 80:8 82:18,18,22 82:22 84:21,21 85:13,14,15,16 86:7,13,19,23 87:10,17,18,21,22 87:23 88:10,11,12 88:13,14,15,17,17 88:20 91:9,9,19 95:1,2 97:17,21 98:3,4 Solid 26:15 solids 79:9 solubility 60:5 solvents 76:23 some 12:13 14:16 16:18 18:5 19:4 27:11,13 29:1 31:9 34:4 35:13 36:7 41:20,21 43:10 45:9 56:11 59:3,17 60:12 62:5 65:22 66:20,20,22 67:13 69:11 70:10,20 71:22 73:19 74:16 75:23 76:4,15 77:15,24 78:7 80:18,18 82:3 85:11 87:13,14,16 96:5 somebody 32:9 47:17 60:22 61:12 61:21 67:7 85:5 someone 41:3 76:23</p>	<p>93:16 something 16:23 37:7 38:10 42:17 43:1 47:1,4,22 56:14 61:11 64:6 67:17 68:19 78:23 97:20 sometimes 51:13 87:7 somewhat 7:8 16:15 32:8 soon 34:6 sooner 99:24 sorry 9:5 18:19 98:15 sort 52:24 53:4 61:2 86:15 95:10 sound 44:6 source 24:11 39:11 43:21 60:12,15,17 61:1,6,15,15,18 63:11,21 70:14 72:9,10,11 74:6,10 79:7 80:1,19 81:17 86:22,22 88:21 89:5 91:8 92:2,9 92:10,10 93:4,12 93:12,17,21 94:5 97:24 sources 43:17 53:1,5 53:9,23 58:3 61:1 61:9 62:17 63:16 76:20 77:6,9 83:19 84:7,15 south 30:17,20 space 72:15,15 76:8 87:13,13,14 spaces 50:23 spatial 76:4 80:14 speak 7:4,5 35:2 85:15 specific 8:16 32:4 58:14 64:21 specifically 29:9 31:24 32:16 49:13 50:2 53:10 57:17 specification 20:12 specified 26:3 specifies 25:5,22 26:6 speed 81:6 spelled 18:4 spend 35:19 56:13 spending 85:7 spent 14:7 spread 79:4,5 Springfield 1:9 2:13 2:18,22 5:5 101:7 square 36:23 SRAC 34:3</p>	<p>SS 101:1 stability 94:13 staff 2:7 11:20 stake 42:18 standard 17:19,24 78:7,8 82:8,16 88:12 standards 23:3 57:15 63:12 82:21 82:21 85:15 96:14 start 13:24 46:20 67:20 88:1 started 14:6 51:8 state 12:3 13:13 17:8,9,23 27:9 34:21 37:17 58:2 58:11 79:8 93:8 94:14 99:6 101:1,5 stated 11:16 states 13:12,21 50:22 54:17 55:20 65:9,13,20 66:6,17 66:22 82:7,8 83:1 84:24 stating 63:15 statistical 25:23 26:2,14 statistics 26:6 statute 13:21 stay 72:5,16 steady 93:8 94:14 steady-state 92:2 93:4,6 94:5 step 72:8,20 73:2,3 86:4,16,18 90:7 steps 73:9,23 85:3 85:10,20,21 86:4,5 89:4 95:10 still 6:17 21:6 30:10 38:15,22 41:23,24 42:2 43:16,20,20 45:24 50:5 63:9 stood 37:22 stop 89:19 storage 12:1 stored 84:1 straightforward 83:15 stratigraphy 98:5 streamlining 62:4 Street 1:15 2:17 strikes 89:22 strong 81:22 structure 19:23 35:7 47:6,15 structures 17:21 47:12 struggled 41:9 stuck 87:21 studies 16:18 40:4</p>	<p>54:1 56:10 study 7:20,24 8:2,4 56:14 stuff 38:23 subject 14:2 16:2 submit 20:15 submitted 13:17 14:6 18:7 submitting 49:19 subsection 18:9 54:16 55:18,20 subsequent 18:8 substantial 42:18 substantially 45:6 subsurface 57:4 80:8,22 95:11 sub-slab 23:10,19 sucks 81:12 sudden 41:18 suggesting 63:3 suggestion 64:1 suggests 89:17 suitably 37:8 summaries 6:7 12:8 26:23 summarize 12:13 87:24 88:19 summary 22:10 24:16 summer 47:17 97:1 Superfund 53:10 supplement 68:13 supplementing 20:20 supported 13:3 supports 47:20 supposed 24:8 sure 18:20 23:15 35:1 45:24 47:9,11 49:23 51:3 59:19 62:6 65:4 67:4 68:7,12 69:16 73:12,13 90:6 97:11 surface 38:16 50:24 54:20 71:23 suspect 83:20 swear 11:11 45:8 59:20 sworn 6:23 11:12 59:17,21 symbol 24:11 system 13:11,13,16 38:22 75:3 76:6 91:4 94:12</p> <hr/> <p style="text-align: center;">T</p> <hr/> <p>T 2:21 table 14:20 16:8 22:17,18,20 23:22</p>	<p>24:1,10 36:6,14 38:15 41:20 50:24 51:1,3 54:21 55:2 58:15,17 60:21,22 62:12,15 63:14 64:7,12 65:19 66:1 66:4 68:17 71:3,5 71:7 tables 23:4 40:23 41:2,10,17 57:12 60:11 88:24 TACO 5:10,14 12:20 13:1,8,20 14:3 16:6 20:1 24:14,22 25:19 37:22,24 38:6,10 41:1,7 45:1 49:12 58:18 59:1 61:5 62:18 69:4 70:19 88:3 TACO's 5:15 take 6:14 7:11,15,16 7:18 9:4,9,11,18 13:24 41:18 48:7 51:17 53:24 55:15 57:22 63:24 65:2 67:19 78:24 90:1 93:12 taken 29:7 67:22 91:21 101:9 takes 86:3 taking 50:17 56:5 talk 7:5 15:11 18:5,6 65:17 70:9,14,16 74:3 78:20 83:4 talked 40:4 56:7 72:3 74:12 76:12 80:13 85:3,11,19 86:9 87:5 talking 20:1 33:6 35:19 37:1 41:11 44:5 54:24 57:7 71:4 73:18,20,21 75:15 79:12 82:4 84:7 87:15 93:1,3 94:5,10 96:9 tank 12:1 40:21 Tanner 2:4 5:22 target 87:23 taught 69:2 team 69:23,24 technical 5:24 85:1 92:15 93:10 technically 92:9 technologies 15:2,4 16:15 18:15 89:17 technology 18:10 tell 36:5 83:5 temperature 35:14 36:9 52:13,16 75:9</p>
--	--	---	---	---

<p>75:14,16 temporal 76:4 97:3 ten 25:6,13 39:1 72:5 75:15 78:13 80:1 86:11 90:14 90:15,16 tend 66:21 80:5 tent 47:12 tents 47:9 ten-minute 67:19 term 15:20 51:1 64:19 terms 12:15 13:7 36:5 40:21 47:3 50:11 59:6 64:17 64:18 74:22 94:7 testified 12:21 44:24 testify 6:12,23 7:1 8:9 testifying 13:5 99:1 testimony 6:3,7,8,10 6:15,24 7:1 8:12 8:13,19 9:13,21 10:3,12,15 12:11 16:18 18:12 20:6 22:12 24:7,23 33:22,23 34:5,13 35:19 40:5 43:4 45:9 51:20 53:2,8 53:15 57:10,11,13 58:1,11 59:18 60:16,18 62:3,12 68:1 99:8 testing 43:6,8 Texas 60:1 84:10,11 thank 9:18 11:13 12:9 19:1 22:8 24:17 26:18,21 27:15,17 28:23 32:11 33:20 34:16 34:18 44:17 45:20 46:8 49:21 50:20 51:18 52:22 54:13 56:20 57:23 58:9 60:8,9 64:3,4,24 67:1,18 68:4,22 69:14,17 89:24 90:11,22 97:14 98:22 100:5 Thanks 59:14 61:24 their 6:7,24 17:12 29:24 56:3 65:13 65:20 86:1 91:9 100:5 theta 39:18 thicker 37:18 thickness 55:19,24 thing 13:19 20:5 53:4 66:5 72:14,20 77:13 79:13 87:7</p>	<p>87:10 things 14:4 15:16 16:21 20:3 29:6 31:14 35:21 37:19 41:8 42:22 44:3 49:5 50:10 61:12 62:6 65:14 70:9 71:21 76:5 83:9 think 12:15 13:13 13:14,19 15:6 17:7 17:17,24 18:3 28:1 30:23 31:23 32:4 32:10,24 34:14,14 36:15 37:13 38:4 38:14 42:12 44:14 45:6,17 48:8 49:8 49:18 50:4,22 51:11 60:4,20 61:16,16 62:21,22 63:19 64:22 65:1 65:14,23 67:8 68:14 69:23 70:6 71:20 72:11 74:22 75:21 89:19,21 90:12,14 91:10 94:1,9 thinking 36:23 51:14 91:11 94:2,8 thinks 67:13 third 72:14,20 98:8 98:13 Thomas 2:5 3:4 5:23 8:20 10:12 Thompson 99:18,21 thought 7:17 20:10 35:22 36:11 44:6 51:12 57:18 69:10 70:11 thousands 94:3,3 three 17:7 44:24 47:18 54:19 70:9 74:8 80:2 81:21 85:14 88:16 three-tiered 16:7 through 15:22 17:15 17:24 18:3,13 28:1 35:9,22 36:13,13 36:24 48:14,21 65:16 71:10,10 74:11,14 80:20,20 80:21 85:21 86:22 87:1,3 91:8,9 97:18 98:20,21 throughout 64:20 tier 14:20 16:7,9,10 16:11,12 22:17 33:8,11,12,14 36:2 39:3,14 43:19 44:9 44:10 48:18 65:19 65:22 66:1,4 81:23</p>	<p>82:1 84:16 88:11 89:2,2 92:13,14,14 92:19 93:19,20 95:21,22,24 97:7 Tiered 1:4 5:8 time 6:13 12:19 25:18,19,20,20 26:22 27:6 35:19 42:6 46:22 47:5,12 49:12 50:1,4 56:13 66:13 71:8 73:12 76:5,6,8 77:1 78:1 78:23 79:2,3,18 80:6 85:7 100:4 timely 89:7 times 45:1 timing 34:9 title 26:13 27:10 today 5:5,17,20 6:4 6:11,18,18 7:14 11:20,21 13:6 27:11,18 44:20 45:13 60:11 68:15 99:1 100:5 today's 6:1,13,20 99:22 together 16:20 18:11 68:24 69:7 70:1 told 26:16 tolerance 25:8,14 26:2 Tom 12:4 24:20 tomorrow 6:17 top 38:16 54:23 70:21 71:15 total 55:22 97:16 touchstone 50:14 toward 6:13 7:16 towards 66:13 toxic 73:16 toxicity 12:5 22:24 24:21 53:16,18 61:4 73:6 86:2 88:4 toxicologist 12:4 trace 77:3 Tracey 3:4 8:20 10:15 12:3,4 22:11 tracked 56:12 training 69:21 transactions 17:18 17:21 31:23 transcribed 101:10 transcribing 7:3 transcript 7:6 99:22 101:11 transient 75:13 transit 7:8 transmit 14:10</p>	<p>travel 79:11 tried 37:20 true 14:5 42:13 101:11 truly 46:7 trump 43:16 try 40:5 45:14 85:9 trying 32:8 36:22 43:5 47:4 48:1 50:10 51:8 56:13 turn 12:7 34:24 42:11,13 two 12:14 32:21 40:10 45:4 52:8,11 65:13 78:17,20 82:10,24 83:5,9 91:16 93:13 95:18 98:8 type 15:1 39:3 44:10 71:15,18 74:6 75:2 84:19 86:13 89:14 89:15 92:13,19 93:4 types 15:3 17:2,3 89:13 97:17 typically 15:14 73:17,20 77:23 98:1 typographical 23:24</p> <hr/> <p style="text-align: center;">U</p> <hr/> <p>U 21:22 under 19:6 21:19,23 29:19 31:6 37:22 37:23 40:7 43:19 71:5,22,23 77:9 78:14 81:7,8 89:2 94:17 96:22 98:5 underground 12:1 underlined 96:24 underlying 29:11 understand 27:12 35:4 60:17 61:18 70:1 understanding 28:5 33:1 64:20 69:11 understood 51:1 Unified 25:18,22 26:10 unique 13:21 83:3 84:2 unit 5:24 12:3,5 24:22 unknown 29:24 unless 7:12 unsaturated 71:2,11 74:13 until 26:23 update 5:16 13:1 updated 22:22 58:6</p>	<p>58:8 updates 22:12,14,24 23:1 58:3 updating 12:18 upper 25:8,14 26:1 usable 89:21 usage 19:22 use 23:19 25:24 37:21 41:19 43:6 65:24 75:6 77:1 80:7 82:19 83:1,7 93:17 98:6 used 22:20 25:23 26:6 36:9,10,11 37:23,24 39:6 48:12 53:9 54:2 56:3,22 60:13 61:4 63:12 78:10 84:23 89:11 97:18 USEPA 26:15 36:10 56:3,6,22 59:3 62:14 84:23 USEPA's 53:10,13 53:16,17 58:12 82:9 user 61:17 users 17:22 User's 57:4 uses 58:3 87:21 using 17:24 20:1 25:3,9,20 33:11 36:10 43:10 60:22 61:21 84:22 85:10 85:18,19,20 91:19 93:21</p> <hr/> <p style="text-align: center;">V</p> <hr/> <p>vacuum 81:11 vadose 74:13 86:22 92:23 vague 60:22 value 23:22,23 24:1 24:3,5 37:14 63:4 86:3 95:24 values 22:21 23:1 25:7 38:8 40:7 41:1,1,6,7 43:22 53:10,16,19 58:2 61:4,16 62:22 63:22 74:23 76:11 76:15 85:12 89:1 89:10 95:7 96:2 97:4 vapor 10:4 15:15,20 17:20 21:5 32:14 38:5 51:23 57:4 65:11 66:23 73:14 77:21 84:21 85:14 85:16 87:23 88:20 89:13 91:19 94:6</p>
--	---	---	--	---

<p>vapors 70:23 71:9 75:6,12 76:2 78:2 78:13 79:23 80:20 80:24 81:9 82:22 83:21 87:1,15,20 91:7,12,13,14,23 92:7,14 97:17 98:20</p> <p>variability 76:5 80:14,22 97:3</p> <p>variable 81:16</p> <p>variation 97:2</p> <p>varied 39:3</p> <p>varies 98:5</p> <p>variety 17:2</p> <p>various 29:3 35:21 63:15 80:12 87:12 88:24</p> <p>vary 39:12 76:13</p> <p>ventilation 46:5 75:3 76:5 95:19</p> <p>version 24:14</p> <p>versus 41:6 79:22 92:24 93:2 94:11 97:1,1</p> <p>very 13:9,10,23 14:1 14:4,16 39:9 45:18 52:6 60:6,6 63:14 64:21 69:14,17,22 69:24 70:2,5,5,5 71:4 73:21 75:13 80:6 81:19 82:24 83:18 84:4 85:1 89:20,21,22 92:10 93:4,17,18,18 95:19 97:14</p> <p>vibrate 79:9,10,17</p> <p>vibrated 79:6</p> <p>vibration 79:9</p> <p>vibrations 79:16</p> <p>visualize 38:23 74:1 78:24 79:13</p> <p>VOC 51:22</p> <p>void 50:23</p> <p>volatile 17:11 19:11 42:7,8 43:11 51:21 51:24 52:7,8 58:12 58:18 59:1,4,13 72:3 77:19 78:14 78:16</p> <p>volatiles 59:10</p> <p>volatilization 49:10 72:2,9 75:10 85:3</p> <p>volatilize 58:13,24 59:2,4 70:20 71:24 71:24 72:4,5</p> <p>volumetric 55:20 56:1</p> <hr/> <p style="text-align: center;">W</p>	<p>w 39:18</p> <p>Wait 31:21</p> <p>walls 76:17</p> <p>want 18:20 20:7,17 20:22 23:11 26:24 27:17 29:8 57:1 59:17,22 62:2 64:5 65:5 66:19 67:14 90:6 94:4,8 98:7</p> <p>wanted 9:7 16:21 18:6 19:15 20:5 28:3 29:4,10 30:24 32:3 33:21 34:1,19 38:9 41:9 45:23 46:2 47:9 52:7 54:5 65:7 68:12 69:9 90:4 93:17</p> <p>wants 32:9</p> <p>wasn't 9:12 64:9 68:11 69:16</p> <p>Waste 26:16</p> <p>water 53:13 56:1 64:7,12 68:17 71:3 71:5,6,7 74:19 78:24 79:4,12 80:14</p> <p>water-filled 39:18</p> <p>Waugh 1:13 101:4</p> <p>way 5:11 15:13,14 15:16 17:10 18:16 25:21 31:14 32:9 36:4,11 41:2 44:2 51:21 61:2 64:1 68:20 78:24 85:21 87:8 89:8</p> <p>ways 82:7</p> <p>weather 69:15</p> <p>Web 53:4 61:4,5,8 61:11,15 62:18,21 62:22 66:11 99:23</p> <p>week 20:10</p> <p>weekdays 97:2</p> <p>weekends 97:1</p> <p>weights 83:2</p> <p>welcome 5:4</p> <p>well 5:16 6:5 7:18 15:5 20:23 21:3 26:22 27:24 28:21 32:23 33:4 34:11 36:15 37:19 38:7 39:4 45:10 46:24 47:19 49:4,5,6 51:1,23 52:6 61:3 62:20 80:11 84:10 91:7 93:1,15</p> <p>wells 98:3</p> <p>went 14:21 15:4 18:13 37:21 56:2 56:18 61:12</p> <p>were 9:7 22:20 23:8</p>	<p>25:20 29:7 32:6 35:11,23 37:20 38:9 44:3 45:3 46:14,24 47:13 49:13 53:1,2,9 56:12 57:18 58:4 61:4 63:12 69:4 84:22 95:18 98:17</p> <p>weren't 23:9 31:12 32:5 47:10</p> <p>we'll 7:5,13 10:5 18:4 30:15 46:16 46:19 50:7 55:7 57:22 61:23 64:23 67:20,20</p> <p>we're 7:12 13:5,5,7 13:7,17 15:12 18:1 19:10,15 20:1 25:2 27:6,14 28:5 32:8 33:6 34:7,11,12 35:9 37:1 40:17 45:24 48:1 50:12 56:5,5 57:7 63:19 63:19 65:2 66:9,12 66:13,16 67:17,19 67:24 68:14</p> <p>we've 12:24 13:4,24 14:4,24 16:7,14,21 22:15 32:9 41:16 44:15 65:13 66:14 66:20,20 69:8,19 69:21,21 80:5</p> <p>WHEREOF 101:12</p> <p>while 49:22 57:7 92:6</p> <p>whole 34:7 69:6</p> <p>willing 34:2</p> <p>wind 81:6</p> <p>window 46:6</p> <p>winter 97:1</p> <p>wish 7:1</p> <p>witness 3:2 6:8 7:2 38:4 59:20,21 97:9 101:12</p> <p>witnesses 6:6,11 7:11 11:11,12,20 27:7 34:20 43:4 46:10 98:24</p> <p>wonder 34:23</p> <p>wondering 49:14 50:4 52:2 57:8 58:4 60:23 97:19</p> <p>word 53:12</p> <p>words 43:15 74:6 82:20</p> <p>work 35:13 38:21 69:20</p> <p>worked 18:17 69:24</p> <p>working 15:9 49:3 69:23 72:15</p>	<p>works 36:4 70:7 88:1</p> <p>worth 26:1</p> <p>wouldn't 33:8,15 43:16 44:13 84:3</p> <p>wrap 7:12</p> <p>written 41:3</p> <hr/> <p style="text-align: center;">X</p> <p>X 63:16</p> <hr/> <p style="text-align: center;">Y</p> <p>yeah 34:11 41:8,15 44:12 45:2 47:20 49:8 50:9 51:12 55:4 58:19 63:23 68:14 73:17 84:11 91:18 93:23 97:22</p> <p>year 14:7 17:19</p> <p>years 14:3 69:3,18 69:19 75:21</p> <p>York 66:7</p> <hr/> <p style="text-align: center;">Z</p> <p>Zeman 2:20 27:23</p> <p>zone 54:20,21 64:10 64:10,13,13 68:17 71:2,8,11 74:13 81:18 86:22 92:23 98:19</p> <hr/> <p style="text-align: center;">\$</p> <p>\$1,000 84:13</p> <p>\$30,000 84:12</p> <hr/> <p style="text-align: center;">#</p> <p>#084-003688 101:19</p> <hr/> <p style="text-align: center;">0</p> <p>084-003688 1:14</p> <hr/> <p style="text-align: center;">1</p> <p>1 4:3 9:16,20,22 10:23 14:20 16:7 16:11 18:8,22 22:13,17 23:4 24:7 24:8,9,24 33:8,14 36:2 48:18 57:11 65:19,22 66:1,4 88:11 92:14 93:20 95:22</p> <p>1,000 36:23</p> <p>1,4-Dichlorobenze... 24:2</p> <p>1.50E+00 23:23</p> <p>1.50E+02 23:24</p> <p>10 4:3,4,4,5,5 36:21 36:21 99:17</p> <p>10:35 1:8 5:2</p> <p>102.202(e) 54:3</p>	<p>1021 1:8 2:13 88:1</p> <p>11 1:15 4:6,6,7 60:15 62:12</p> <p>12 3:3 49:23 99:10</p> <p>12,000 24:6</p> <p>12:25 67:20</p> <p>12:35 67:20</p> <p>120 24:3</p> <p>125 14:13</p> <p>13 23:7</p> <p>130 14:13</p> <p>15 25:7</p> <p>152 38:17</p> <p>17 5:18 55:19 99:17</p> <p>18 5:18 53:19 99:20</p> <p>1991 58:7</p> <p>1997 12:21 25:19</p> <p>1999 25:17</p> <p>1999c 26:16</p> <hr/> <p style="text-align: center;">2</p> <p>2 4:3 9:16,23 10:1 16:9,12 19:2 20:4 22:14 23:5,13,21 24:10 28:6,24 29:9 29:17 33:11 39:3 39:14 53:8 57:11 58:1 89:2 90:7 92:14</p> <p>2b 29:9</p> <p>2-Methylnaphthal... 58:22</p> <p>2-025 99:22</p> <p>20 6:2 8:5 37:5,5 52:14,19,20</p> <p>2004 57:5</p> <p>2007 14:9</p> <p>2008 5:12 8:6</p> <p>2009 1:8 5:2,18 99:17 101:8,14</p> <p>215 2:17</p> <p>22 3:4</p> <p>24 3:4 99:8</p> <p>25 36:11 52:13,19 52:20</p> <p>27 1:8 5:2 101:8</p> <p>27(b) 7:21</p> <p>277-0190 1:16</p> <hr/> <p style="text-align: center;">3</p> <p>3 4:4 5:11 10:6 16:10 28:6,24 33:12 43:19 44:10 53:15 81:23 82:1 84:16 89:2 92:13 92:19 93:19 95:21 95:24 97:7</p> <p>3.3 24:5</p> <p>30 8:1</p> <p>304.8 38:24</p>
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<p>3150 2:22 35 1:5 5:9</p> <hr/> <p style="text-align: center;">4</p> <p>4 4:4 10:10 18:15 33:23 90:11 410(b)(1) 26:5 44th 1:15 45 8:1</p> <hr/> <p style="text-align: center;">5</p> <p>5 4:5 10:13 99:9 5th 101:13 5,500 24:4 50 25:15 55 25:15 59 16:1 40:24 41:7</p> <hr/> <p style="text-align: center;">6</p> <p>6 4:5 10:16 28:6 99:23 618 1:16 620 57:15 62226 1:16 62701 2:18 62705-5776 2:22 62794-9276 2:13 69 3:5</p> <hr/> <p style="text-align: center;">7</p> <p>7 4:6 8:6 11:1 28:6 29:10 32:12,12 51:20 58:11 740 50:17 742 1:6 5:10 742.105(i) 19:3 742.1210(c)(4) 18:9 742.200 48:11 742.227 23:6,9,18 54:15 742.410(b)(1) 25:5 742.505(a)(2)(D) 24:12 742.505(b)(5) 24:13 742.812 55:18 742.935(b) 23:20</p> <hr/> <p style="text-align: center;">8</p> <p>8 4:6 11:5 20:8 21:2 28:9 8260 59:9,10 8270 59:10,10</p> <hr/> <p style="text-align: center;">9</p> <p>9 4:3,7 11:8 28:23 28:23 53:13 99:20 9-040 99:17 90 55:21 90s 69:5 96 13:1</p>	<p>97 49:7</p>			
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