



1           A P P E A R A N C E S:

2                           HEARING TAKEN BEFORE:

3                           ILLINOIS POLLUTION CONTROL BOARD  
4                           100 West Randolph Street  
5                           Suite 11-500  
6                           Chicago, Illinois 60601  
7                           (312) 814-4925  
8                           BY: MS. AMY MURAN FELTON,  
9                           HEARING OFFICER.

10           ILLINOIS POLLUTION CONTROL BOARD MEMBERS PRESENT:

11           Ms. Marili McFawn  
12           Mr. Ronald C. Flemal, Ph.D.  
13           Ms. Kathleen Hennessey

14           ILLINOIS POLLUTION CONTROL BOARD TECHNICAL  
15           ADVISORS PRESENT:

16           Mr. Chuck Feinen  
17           Mr. Hiten Soni  
18           Ms. Elizabeth Ann  
19           Mr. Anand Rao

20           ILLINOIS ENVIRONMENTAL PROTECTION AGENCY MEMBERS  
21           PRESENT:

22           Ms. Kimberly A. Robinson  
23           Mr. Gary P. King  
24           Mr. John Sherril  
25           Dr. Thomas Hornshaw  
26           Mr. H. Mark Wight  
27           Mr. Christopher L. Nickell

28           OTHER AUDIENCE MEMBERS WERE PRESENT AT THE HEARING  
29           BUT NOT LISTED ON THIS APPEARANCE PAGE.

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(Documents marked.)

HEARING OFFICER FELTON: Good morning.  
My name is Amy Muran Felton, and I'm the named hearing officer in this proceeding. I would like to welcome you to this hearing in the matter of Tiered Approach to Corrective Action Objectives, 35 Illinois Administrative Code 742, docket B.

Present today on behalf of the Illinois Pollution Control Board and seated to my left is the presiding board member of this rulemaking, Marili McFawn. Also joining us is Board Member Dr. Ronald Flemal and Board Member Kathleen Hennessey. Further joining us is Chuck Feinen, attorney assistant to board member Joe Yi, and Hiten Soni, Anand Rao and Elizabeth Ann, the board's technical advisors.

Over here on the table, I have placed notice lists and service list sign-up sheets. Please note that if your name is in the notice list, you will receive copies of the board's opinions and orders. If your name is on the service list, you will not only receive copies of the board's opinions and orders, but you will receive documents filed by all parties in the

1 service list in this proceeding. Keep in mind if  
2 your name is on the service list, you are also  
3 required to provide copies of all documents you  
4 file with the board to all parties on the service  
5 list.

6                   You are not precluded from  
7 presenting questions if your name is not on either  
8 of the notice or service list. If you have any  
9 additional questions regarding the notice and  
10 service list, please talk to me during one of our  
11 breaks. Copies of the board's May 1st, 1997,  
12 opinion and order and the notice and service list  
13 signup sheet are also on that table. The agency  
14 is in the process of preparing a text of the  
15 proposed rules including the necessary  
16 strike-throughs and underlines. The board has  
17 prepared a draft text of the proposed rules for  
18 the sake of this hearing, and that document is  
19 also located on the table.

20                   This hearing will be governed by  
21 the board's procedural rules for regulatory  
22 proceedings. All information which is relevant  
23 and repetitious or privileged -- strike that --  
24 which is relevant or repetitious will be

1 admitted. All witnesses will be sworn and subject  
2 to cross questioning. This hearing will be  
3 continued on the record to Thursday, May 22nd,  
4 1997, at 10:00 a.m. in the auditorium at the State  
5 of Illinois Center in Chicago, if necessary, to  
6 accommodate the agency's presentation and response  
7 to questions.

8                   This proposed rulemaking was filed  
9 on May 1st, 1997, and is intended to fulfill the  
10 mandates of Title XVII of the Environmental  
11 Protection Act. Title XVII was added to the act  
12 by Public Act 89-431 which was signed and became  
13 effective on December 15th, 1995. On September  
14 16th, 1996, the Illinois Environmental Protection  
15 Agency proposed a new part 742 to the board's  
16 rules to create a tiered approach to establishing  
17 corrective action objectives, also known as  
18 T.A.C.O.

19                   On November 7th, 1996, the board  
20 adopted the T.A.C.O. proposal docket A for first  
21 notice. On April 17th, 1997, the board adopted  
22 the T.A.C.O. proposal docket A for second notice.  
23 The proposed rules in docket B contain amendments  
24 to the new, not yet final, part 742. The proposed

1 rules in docket B were originally proposed by the  
2 agency after the close of hearings in docket A.

3                   Because the agency's proposed  
4 amendments to docket A were proposed after the  
5 close of hearings in docket A and the issues  
6 raised by the agency could not be resolved based  
7 upon the record developed during hearings on  
8 docket A, the board found in its May 1st, 1997,  
9 opinion and order that there was not sufficient  
10 time to resolve these issues and adopt any  
11 necessary amendments as a part of T.A.C.O. docket  
12 A.

13                   Accordingly, the board opened this  
14 docket B and found it was necessary to conduct  
15 public hearings about the proposed rules pursuant  
16 to its own rulemaking authority under sections 27  
17 and 28 of the act. The hearing today concerns  
18 those rules proposed in docket B. Generally these  
19 rules relate to mixtures of similar-acting  
20 substances. The purpose of today's hearing is to  
21 allow the agency to present their testimony in  
22 support of that proposal and to allow questioning  
23 of the agency.

24                   Procedurally, this is how I plan to

1 proceed. We have received one prefiled testimony  
2 from Thomas C. Hornshaw of the agency.  
3 Mr. Hornshaw will read his testimony into the  
4 record for the benefit of all parties to this  
5 proceeding. We will then allow the agency to  
6 present any supplemental testimony they may have  
7 regarding their proposal. Subsequently, we will  
8 allow for questioning of the agency regarding  
9 their testimony.

10 I prefer that during the  
11 questioning period, all persons with questions  
12 raise their hands and wait for me to acknowledge  
13 them. When I acknowledge you, please stand and  
14 state in a loud, clear voice your name and your  
15 organization you represent, if any.

16 Are there any questions regarding  
17 the procedures I have just stated before we  
18 proceed?

19 MS. ROBINSON: Well, would it be  
20 possible for the agency to have all witnesses  
21 sworn in and answer in a panel format, if  
22 necessary?

23 HEARING OFFICER FELTON: That would be  
24 fine. At this time I would like to ask Board



1 Member McFawn if she has anything else she would  
2 like to add to my comments.

3 MS. MC FAWN: Just to welcome you all  
4 here. It should be a rather efficient hearing  
5 given the people that are here. We're all  
6 familiar with T.A.C.O., and the questions have  
7 been, I think, pretty well articulated by the  
8 board's orders and also by -- framed also by the  
9 prefiled testimony we've received. So thank you  
10 for coming.

11 HEARING OFFICER FELTON: Board Member  
12 Flemal or Board Member Hennessey, do you have any  
13 other additional comments you would like to add?

14 MS. HENNESSEY: No thank you.

15 HEARING OFFICER FELTON: At this time I  
16 would ask the agency if they would like to make an  
17 opening statement, and we will turn to the  
18 agency's presentation of their proposal.

19 MS. ROBINSON: I'm going to let  
20 Dr. Hornshaw do a little opening statement, but as  
21 a start matter, I would like to have everybody  
22 with the agency introduce themselves.

23 I am Kimberly Robinson with the  
24 Division of Legal Counsel for the Bureau of Land.

1 DR. HORNSHAW: I'm Tom Hornshaw. I'm a  
2 toxicologist in the Office of Chemical Safety.

3 MR. SHERILL: I'm John Sherril, a  
4 project manager in the Bureau of Land.

5 MR. WIGHT: I'm Mark Wight with the  
6 Division of Legal Counsel.

7 MR. NICKELL: I'm Chris Nickell, the  
8 project manager in the Bureau of Land.

9 MR. KING: I'm Gary King. I'm in the  
10 Bureau of Land.

11 (Discussion off the record.)

12 MS. ROBINSON: Could we swear the  
13 witnesses, please.

14 (Witnesses sworn.)

15 MS. ROBINSON: Dr. Hornshaw, if you'd  
16 like to proceed.

17 DR. HORNSHAW: Before I read my  
18 testimony, I'd like to mention that in our review  
19 of the various documents talking about mixtures of  
20 similar-acting substances, we found slight  
21 discrepancies in the various documents.

22 Errata sheet No. 3, second notice  
23 and the proposed version of this docket had slight  
24 discrepancies in the language. So our discussion

1 will be based on what's in my testimony, and  
2 that's how we view the way to address the mixtures  
3 of similar-acting substances in this proceeding.

4 MS. ROBINSON: Dr. Hornshaw, I'm going  
5 to show you what's been marked by the court  
6 reporter for identification as Exhibit No. 1, if  
7 you could look at that and tell me if you  
8 recognize it.

9 DR. HORNSHAW: Yes, this is a copy of  
10 the testimony I prepared for this proceeding.

11 MS. ROBINSON: Is that a true and  
12 accurate copy?

13 DR. HORNSHAW: Yes.

14 MS. ROBINSON: And what's been marked as  
15 Exhibit No. 2 for identification, would you take a  
16 look at that and tell me if you recognize it.

17 DR. HORNSHAW: Yes. This is a draft of  
18 proposed language for docket B that was sent to  
19 the agency.

20 MS. ROBINSON: Was this drafted by the  
21 board?

22 DR. HORNSHAW: Yes.

23 MS. ROBINSON: Okay. Would you please  
24 proceed with the reading of your testimony into

1 the record.

2 MR. RIESER: Excuse me, Ms. Robinson, is  
3 Exhibit 2 the same as draft of agency proposal,  
4 copies of which were sent around today?

5 MS. ROBINSON: That's correct.

6 DR. HORNSHAW: Good morning. My name is  
7 Thomas C. Hornshaw. I am a senior public service  
8 administrator and the manager of the Toxicity  
9 Assessment Unit within the office of Chemical  
10 Safety of the Illinois Environmental Protection  
11 Agency. I have been employed at the agency since  
12 August of 1985, providing expertise to the agency  
13 in the area of environmental toxicology.

14 Major duties of my position include  
15 development and use of procedures for toxicity and  
16 risk assessments, review of toxicology and hazard  
17 information in support of agency programs and  
18 actions and critical review of risk assessments  
19 submitted to the agency for various cleanup and  
20 permitting activities. I have previously  
21 presented a summary of my qualifications at the  
22 first hearing in this rulemaking and will not  
23 repeat them here. My testimony today will be  
24 limited to discussion of the agency's rationale

1 for the development of remediation objectives for  
2 mixtures of similar-acting substances in soil and  
3 groundwater.

4 I must preface my testimony with an  
5 apology to the board and to the other participants  
6 in this rulemaking for the agency introducing new  
7 language to part 742 regarding mixtures of  
8 similar-acting substances in errata sheet No. 3 so  
9 late in the rulemaking process. Please understand  
10 that there was no intent by the agency to sidestep  
11 the hearing process or in any other manner to try  
12 to undo any agreements reached by the agency and  
13 the advisory committee.

14 Rather, as will be demonstrated by  
15 this testimony, the agency attempted to clarify  
16 the approach to be used at sites where groundwater  
17 has been found to be contaminated with two or more  
18 chemicals which affect a similar target in the  
19 body and to avert potential legal disputes where  
20 such conditions were found to exist.

21 The agency has included language  
22 for addressing mixtures of similar-acting  
23 substances in part 742 from the very beginning of  
24 this rulemaking. This concern for mixtures

1 derives in part from long-standing agency policy  
2 and more importantly from statutory directive.  
3 Section 58.4(c)(4)(B) of Title XVII specifically  
4 requires that methodologies adopted by the board  
5 for determining remediation objectives must ensure  
6 that, in quote, "The presence of multiple  
7 substances of concern and multiple exposure  
8 pathways," end quote, are taken into account.

9                   As a result of this concern, the  
10 agency included language in Tier 2 of the original  
11 proposal requiring that for noncarcinogens that  
12 affect the same target in the body, soil  
13 remediation objectives for such noncarcinogens be  
14 adjusted to account for the additive effects of  
15 the mixture in soil. This language, which limits  
16 the necessity to address mixtures of  
17 similar-acting substances to Tier 2 assessments  
18 and to noncarcinogens, came about because of  
19 discussions with the advisory committee.

20                   Specifically, it was decided that  
21 the inherent conservatisms built into the process  
22 of developing the Tier 1 soil remediation  
23 objectives made consideration of the additivity of  
24 effects of similar-acting substances unnecessary

1 -- I'm sorry -- unnecessary in Tier 1. It was  
2 only necessary to address mixture effects of  
3 noncarcinogens in Tier 2 because for carcinogens,  
4 the statutory language of section 58.5(d) of Title  
5 XVII specifically provides for the establishment  
6 of remediation objectives at an excess lifetime  
7 cancer risk of between 1 in 10,000 and 1 in  
8 1,000,000.

9                   It was agreed that since the  
10 statute provides for an acceptable cancer risk  
11 range and since even if there are 10 carcinogens  
12 present at their respective 1 in 1,000,000  
13 remediation objectives (an unusual event) the  
14 cumulative cancer risk of 1 in 100,000 is still  
15 within the acceptable range. Therefore,  
16 consideration of the additivity of carcinogenic  
17 effects in Tier 2 was unnecessary. Since  
18 corresponding statutory guidance regarding an  
19 acceptable risk range for noncarcinogens is not  
20 provided in Title XVII, the additive effects of  
21 noncarcinogens had to be considered and provided  
22 for in Tier 2.

23                   As a result of the above,  
24 provisions relative to mixtures of similar-acting

1 contaminants in soil are still included in the  
2 rules sent to second notice. Regarding  
3 groundwater, it was assumed, at least by the  
4 agency, that the requirements of 35 Illinois  
5 Administrative Code 620.615 regarding mixtures of  
6 similar-acting substances would govern the  
7 development of remediation objectives at a site.  
8 Therefore, the inclusion of language in part 742  
9 addressing mixtures of similar-acting substances  
10 (carcinogens and noncarcinogens) in groundwater in  
11 any tier was not discussed between the agency and  
12 the advisory committee.

13                   As stated above, the topic of  
14 remediation objectives for mixtures in groundwater  
15 had been a non-issue throughout the development of  
16 part 742. In fact, it wasn't until late in the  
17 hearing process that the agency realized that not  
18 including specific language regarding mixture  
19 effects in groundwater had become an issue. In  
20 the context of recommending remediation objectives  
21 for a particular site, the agency included an  
22 objective for a mixture of similar-acting  
23 substances detected in Class I groundwater and was  
24 subsequently questioned whether this type of



1 objective was allowed by part 742.

2                   After some internal discussion, the  
3 agency decided that recommending remediation  
4 objectives for mixtures of similar-acting  
5 substances in Class I groundwater in any tier and  
6 for carcinogens and noncarcinogens is appropriate  
7 because it is required by 620.615 because, quote,  
8 "multiple substances of concern," end quote, is  
9 included in the factors which, by statute, must be  
10 addressed when determining remediation objectives  
11 for a site and because it is health protective to  
12 do so.

13                   However, the agency came to realize  
14 as a result of this discussion that by either not  
15 cross-referencing the requirements of part 620.615  
16 or providing an alternative procedure to part  
17 620.615 in 742, the door remained open for future  
18 debate over the appropriate remediation objectives  
19 when similar-acting chemicals are detected in  
20 Class I groundwater. Furthermore, the agency  
21 foresaw the possibility of a person expecting to  
22 receive a no further remediation determination  
23 from the agency by virtue of achieving all Class I  
24 groundwater objectives only to be told that

1 further remediation would be necessary because the  
2 requirements of part 620.615 have not been met.

3                   Even worse, the agency was  
4 concerned by the possibility, however remote, that  
5 because part 742 is silent about the requirements  
6 for mixtures of similar-acting substances in  
7 Class I groundwater, a no further remediation  
8 letter might be issued and subsequently be  
9 challenged for not meeting the requirements of  
10 part 620.615. It was with these concerns in mind  
11 that the agency informed the advisory committee of  
12 its intent to add language cross-referencing the  
13 requirements of part 620.615 in Tiers 1, 2 and 3.  
14 After admittedly brief discussion, such language  
15 was then included in errata sheet No. 3 for the  
16 board's consideration.

17                   The agency stands by its intent to  
18 have the requirements for remediation objectives  
19 for mixtures of similar-acting substances in  
20 Class I groundwater be very clear. Toward this  
21 end, the agency met with the advisory committee on  
22 May 12, 1997, to further discuss this issue and  
23 the language tentatively included in the proposed  
24 rule for R97-12(B) dated April 17, 1997.

1                   The agency's meeting with the  
2                   advisory committee on May 12, 1997, focused on two  
3                   general areas regarding mixtures of similar-acting  
4                   substances, whether it was agreed that the  
5                   language currently included in part 742 relative  
6                   to mixtures in soil was still acceptable and  
7                   whether the language proposed by the board  
8                   relative to mixtures in Class I groundwater in the  
9                   proposed rule for R97-12(B) is acceptable. Please  
10                  note that the following discussion pertains only  
11                  to Class I groundwater since mixture effects need  
12                  not be considered in Class II groundwater.

13                         Regarding mixtures in soil, it was  
14                         agreed that the language currently in part 742 is  
15                         acceptable. Thus, there should still be no  
16                         requirement to address mixtures of carcinogens or  
17                         noncarcinogens in soil for Tier 1 evaluations or  
18                         mixtures of carcinogens in soil for Tier 2  
19                         evaluations for the reasons discussed above. The  
20                         only requirements regarding mixtures in soil are  
21                         for noncarcinogens in Tier 2 evaluations and  
22                         consideration of mixture effects in formal risk  
23                         assessments in Tier 3 evaluations for carcinogens  
24                         and noncarcinogens.

1                   Regarding mixtures in groundwater,  
2                   several issues were discussed by the agency and  
3                   the advisory committee. It was generally agreed  
4                   that the original version of part 742 was unclear  
5                   regarding the requirements for remediation  
6                   objectives for mixtures in groundwater, although  
7                   the statute mandates that they be addressed. It  
8                   was also generally agreed that consideration of  
9                   mixture effects is required for noncarcinogens in  
10                  Tier 2 evaluations and for carcinogens and  
11                  noncarcinogens in formal risk assessments in Tier  
12                  3 evaluations.

13                         What was still at issue was whether  
14                         mixture effects needed to be addressed in Tier 1  
15                         evaluations (carcinogens and noncarcinogens) and  
16                         whether carcinogens needed to be addressed in Tier  
17                         2 evaluations. In-depth discussion of the  
18                         remaining issues ultimately provided the basis for  
19                         conceptual agreement on how to address these  
20                         mixture concerns.

21                         On the necessity for addressing  
22                         mixtures in Tier 1, it was pointed out by the  
23                         advisory committee members that the statute  
24                         requires only lookup tables in Tier 1, and

1 mixtures cannot be addressed in tables. It was  
2 also pointed out that there was conservatism built  
3 into the development of the Tier 1 groundwater  
4 remediation objectives similar to the reasoning by  
5 which consideration of mixture effects in soil in  
6 Tier 1 was deemed unnecessary. Therefore, it was  
7 not necessary to address mixtures in groundwater  
8 in Tier 1.

9                   On the other hand, it was pointed  
10 out by the agency that, as discussed above,  
11 consideration of mixture effects was required by  
12 both the existing statute (Title XVII) and  
13 regulations (part 620) and that for two reasons  
14 there is not necessarily the same degree of  
15 conservatism built into the Tier 1 groundwater  
16 objectives as in the soil objectives. The first  
17 reason is that there is an additional layer of  
18 conservatism built into the inhalation and the  
19 soil component of the groundwater ingestion  
20 exposure route soil objectives due to the  
21 assumptions made regarding transport in soil.

22                   Whereas for the groundwater  
23 component of the groundwater ingestion exposure  
24 route, the only conservatisms built into the

1 development of the remediation objectives are the  
2 assumptions regarding the toxicity and the actual  
3 intake of the chemical.

4                   The second reason is that for  
5 certain carcinogens whose Tier 1 groundwater  
6 objective is based on the chemical's drinking  
7 water standard, the groundwater objective does not  
8 have the same degree of conservatism as the soil  
9 -- as the corresponding soil objective, that is,  
10 1 in 1,000,000 cancer risk as the basis. This is  
11 due to the consideration of factors other than  
12 risk by USEPA in establishing the drinking water  
13 standards such as natural occurrence, for example,  
14 arsenic; detection limits, for example, vinyl  
15 chloride; or risk/benefit analysis, for example,  
16 drinking water disinfection by-products.

17                   On the issue of whether mixture  
18 effects of carcinogens need to be considered in  
19 Tier 2, it was pointed out by the advisory  
20 committee that the statute provides for a range of  
21 acceptable cancer risks from 1 in 10,000 to 1 in  
22 1,000,000. Therefore, even if 10 carcinogens are  
23 present in groundwater at their respective  
24 objectives, the cumulative cancer risk still falls

1 within the acceptable range (again similar to the  
2 reasoning by which consideration of the cumulative  
3 risk of carcinogens in soil was determined to be  
4 unnecessary in Tier 2).

5                   In response, the agency again cited  
6 the carcinogens whose groundwater objectives  
7 exceed the 1 in 1,000,000 cancer risk level and  
8 which, if present in a mixture with other  
9 carcinogens, could potentially result in a  
10 cumulative cancer risk exceeding 1 in 10,000. The  
11 agency also again cited the statutory and  
12 regulatory requirements to consider mixture  
13 effects in groundwater regardless of what tier is  
14 used in evaluating a site.

15                   Following considerable discussion,  
16 conceptual agreement was reached on the remaining  
17 issues. Regarding Tier 1, it was agreed that  
18 other than for those carcinogens whose groundwater  
19 objective is not based on a 1 in 1,000,000 cancer  
20 risk, there is an appropriate degree of  
21 conservatism in the Tier 1 groundwater remediation  
22 objectives such that consideration of mixture  
23 effects is not necessary in Tier 1 provided all  
24 other contaminants of concern detected in

1 groundwater achieve their respective remediation  
2 objectives.

3                   However, if any contaminant of  
4 concern (carcinogen or noncarcinogen) exceeds its  
5 respective Tier 1 groundwater remediation  
6 objective or if a carcinogen whose Tier 1  
7 groundwater objective is not based on a 1 in  
8 1,000,000 cancer risk is detected in groundwater,  
9 then the potential for cumulative effects of  
10 mixtures of such chemicals must be addressed as a  
11 Tier 2 evaluation. Regarding Tier 2, it was  
12 agreed that only those carcinogens whose Tier 1  
13 groundwater objectives exceed the 1 in 1,000,000  
14 risk level must be evaluated for mixture effects  
15 in Tier 2. It was further agreed that the  
16 carcinogens whose Tier 1 groundwater remediation  
17 objectives exceed the 1 in 1,000,000 cancer risk  
18 level will be specifically identified in part  
19 742.

20                   In order to include the conceptual  
21 agreements discussed above into part 742, the  
22 following modifications to proposed rule for  
23 R97-12(B) dated April 17, 1997, are proposed:  
24 Section 742.505(b)(3), change the proposed



1 language as follows: "The requirements of 35  
2 Illinois Administrative Code 620.615 regarding  
3 mixtures of similar-acting chemicals shall be  
4 considered met for Class I groundwater at the  
5 point of human exposure if the following  
6 requirements are achieved:

7 "A) the Tier 1 groundwater  
8 remediation objective listed in appendix B, table  
9 E for Class I groundwater is not exceeded at the  
10 point of human exposure for any contaminant of  
11 concern detected in groundwater.

12 "And B) any contaminant of concern  
13 listed in appendix A, table H is not detected in  
14 any groundwater sample associated with the site  
15 using analytical procedures capable of achieving  
16 either the 1 in 1,000,000 cancer risk  
17 concentration or the ADL, whichever is greater, as  
18 listed in appendix A, table H." Then delete  
19 subsections (A) and (B) currently found in the  
20 proposed rule.

21 Section 742.505(b)(4), add a new  
22 section as follows: "Sites which do not meet the  
23 requirements of section 742.505(b)(3)(A) shall  
24 evaluate mixtures of similar-acting chemicals

1 using the procedures of section 742.805(c) or  
2 section 742.915(h). Sites which do not meet the  
3 requirements of section 742.505(b)(3)(B) shall  
4 evaluate mixtures of similar-acting chemicals  
5 using the procedures of section 742.805(d) or  
6 section 742.915(h)."

7                   Section 742.805(c) - delete the  
8 language currently proposed for second notice in  
9 this section and replace it with the language  
10 currently proposed -- I'm sorry -- currently  
11 listed in the proposed rule for section  
12 742.505(b)(3). Then add a board note after this  
13 section as follows: "Board note: Use of the  
14 procedures specified above in section 742.805(c)  
15 may result in groundwater remediation objectives  
16 that are less than the Tier 1 groundwater  
17 remediation objectives for chemicals included in  
18 these procedures."

19                   Section 742.805(d) - add a new  
20 section as follows: "The requirements of 35  
21 Illinois Administrative Code 620.615 regarding  
22 mixtures of similar-acting chemicals shall be  
23 considered met if the cumulative risk from any  
24 contaminant(s) of concern listed in appendix A,

1 table H, plus any other contaminant(s) of concern  
2 detected in groundwater and listed in appendix A,  
3 table F as affecting the same target organ/organ  
4 system or having a similar mode of action as the  
5 contaminant(s) of concern detected from appendix  
6 A, table H does not exceed 1 in 10,000."

7 Section 742.900(f) - delete this  
8 subsection from section 742.900 of the proposed  
9 rule dated April 17, 1997.

10 Section 742.915(h) - substitute the  
11 language deleted from section 742.900(f) of the  
12 proposed rule above for the language currently  
13 listed in section 742.915(h) from second notice.

14 Section 742.915(i) - create a new  
15 section 742.915(i) by inserting the language of  
16 742 -- I'm sorry -- section 742.915(h) currently  
17 listed in second notice.

18 And finally, appendix A, table H -  
19 create a new table as follows on page 11 of my  
20 testimony which I won't read through. Thank you.

21 MS. ROBINSON: Could we have that  
22 entered as if read through the exhibit?

23 HEARING OFFICER FELTON: Yes.

24 DR. HORNSHAW: Note: Benzene was not

1 included in appendix A, table H even though its  
2 Class I groundwater remediation objective (0.005  
3 milligrams per liter) exceeds its 1 in 1,000,000  
4 cancer risk concentration (0.001 milligrams per  
5 liter) for the following reason: Benzene only  
6 appears in one target organ/organ system category  
7 in appendix A, table F (circulatory system) and  
8 can only be included in a mixture with one other  
9 chemical (2,4,6-trichlorophenol).

10                               Even if both benzene and  
11 2,4,6-trichlorophenol are present in Class I  
12 groundwater at their respective groundwater  
13 remediation objectives, the cumulative circulatory  
14 system cancer risk is only 7.1 in 1,000,000 which  
15 is within the acceptable risk range of 1 in 10,000  
16 to 1 in 1,000,000. Therefore, it is not possible  
17 for benzene to contribute to an unacceptable  
18 cancer risk in a mixture without also exceeding  
19 its individual groundwater remediation objective.  
20 The agency believes the proposed language  
21 discussed above adequately addresses the concerns  
22 for which this docket was created. This concludes  
23 my testimony on this matter.

24                               MS. ROBINSON: Dr. Hornshaw, I'm going

1 to show you now Exhibit No. 2. Could you please  
2 tell me is there also a change to section 742.105  
3 that was not reflected in your testimony?

4 DR. HORNSHAW: Yes, there is.

5 MS. ROBINSON: Could you explain what  
6 that is.

7 DR. HORNSHAW: In discussing or looking  
8 through the proposed part 742 second notice, we  
9 became aware that there was a reference to  
10 mixtures of similar-acting substances in the  
11 applicability section.

12 I'm sorry, it's not a specific  
13 reference to mixtures of similar-acting  
14 substances. It's a reference to section 742.805  
15 which we have modified according to my testimony  
16 today. So because of our changing section  
17 742.805, we are deleting the subsection A which is  
18 currently referenced in the applicability section,  
19 section 105, to make it read just 742.805 to  
20 encompass the changes which we are recommending  
21 today.

22 MS. ROBINSON: Thank you. Now I'm going  
23 to show you also part of Exhibit No. 2 under  
24 742.805(c) and ask you if we've added any language

1 that was not reflected in your testimony there.

2 DR. HORNSHAW: Yes. In section 742.805,  
3 again when we were reviewing the language to make  
4 sure it captured everything that we intended, we  
5 noticed that the language that was proposed in the  
6 -- which one was it now? The language that was  
7 in the draft of R97-12(B) from the board that was  
8 faxed to the agency had language that didn't quite  
9 track with how we had proposed in errata sheet 3,  
10 in that the requirements specified in this new  
11 subsection 805(c) were intended to be an either/or  
12 situation.

13 The way the language read in the  
14 draft of R97-12(B) made it a requirement that both  
15 parts of this section had to be met. So we  
16 substituted the language -- I'll just read it.  
17 "The requirements of 35 Illinois Administrative  
18 Code 620.615 regarding mixtures of similar-acting  
19 chemicals shall be considered met for Class I  
20 groundwater at the point of human exposure" -- and  
21 here is where we added a change -- "if either of  
22 the following requirements are achieved."

23 And then to make it completely  
24 clear, at the end of subsection 1, roman numeral

1 (ii), we added "or." The (ii) ends with "less  
2 than or equal to one." We added an "or" in there  
3 so that it reflects that there's a -- it's in the  
4 wrong place actually. Well, there should be an  
5 additional "or." Wait a minute, let me make sure  
6 this is correct.

7 Yes, the way it's currently worded,  
8 the "or" is between roman (i) and roman (ii), and  
9 that "or" should actually be after roman (ii).  
10 There shouldn't be a choice between the two roman  
11 numerals.

12 MS. MC FAWN: So they'll have to satisfy  
13 both small letter (i) and small letter (ii)? You  
14 want to delete the one that appears after the --

15 DR. HORNSHAW: After the first (i), it's  
16 not really a choice. You either meet or you do  
17 something else to meet. You can't do both (i) and  
18 (ii).

19 MS. MC FAWN: So you can't do both?

20 DR. HORNSHAW: Right. You either exceed  
21 and then you have to go do something else, which  
22 is (ii), but if you've met, then you never get to  
23 (ii). If you meet (i), you don't have to go into  
24 (ii).

1 MS. MC FAWN: All right.

2 DR. HORNSHAW: But then you also have a  
3 choice between 1 and 2. You don't have to meet  
4 either or both of those.

5 MS. MC FAWN: So what's been marked as  
6 Exhibit No. 2, you would propose that the "or" at  
7 the conclusion of small letter (i) of section  
8 742.805(C)(1), you would propose that that be  
9 deleted?

10 DR. HORNSHAW: Right.

11 MS. MC FAWN: And that the semicolon  
12 remain?

13 DR. HORNSHAW: In our copy, it's a  
14 period.

15 MS. MC FAWN: The last line does not  
16 read "for those chemicals" semicolon "or"?

17 DR. HORNSHAW: Not in the version that  
18 was faxed to us.

19 MS. MC FAWN: We can deal with that  
20 later. Then you propose that we insert the word  
21 "or" at the conclusion of 805 -- let me make sure  
22 I get this, (C)(1)(ii)?

23 DR. HORNSHAW: That's correct.

24 MS. MC FAWN: So that the last phrase



1 would read, "In accordance with the equation  
2 above, less than or equal to 1, semicolon or"?

3 DR. HORNSHAW: Correct.

4 MS. ROBINSON: When the agency redrafts  
5 this version, we are going to commit to send that  
6 out to the entire service list hopefully this  
7 Friday. That will be reflected in the new draft.

8 MS. MC FAWN: Before we go on, I just  
9 want to clarify. The change that you talked about  
10 in the first paragraph of 805(c), the words "if  
11 either," that is reflected in the copy before you  
12 or not?

13 DR. HORNSHAW: Yes.

14 MS. MC FAWN: That's reflected on  
15 Exhibit 2 as marked?

16 DR. HORNSHAW: That's correct.

17 MS. MC FAWN: So the only change to  
18 Exhibit 2 is the relocation of the word "or"?

19 DR. HORNSHAW: That's correct.

20 MS. ROBINSON: That would conclude the  
21 agency's testimony at this time.

22 MR. RAO: Can I have a clarification.  
23 About the changes for 742.105, is that change to  
24 be made before we go final notice because that's

1 not part of the docket B.

2 MS. ROBINSON: Right, we'll reflect that  
3 in the draft that we send out on Friday through  
4 strikeouts and underlines.

5 MR. FEINEN: Dr. Hornshaw, in your  
6 testimony, you referred to the April 17th, 1997,  
7 order. There's been two orders in docket B. I  
8 just want to make it clear on the record that the  
9 May 1st order also contains the same language as  
10 the April 17th, 1997.

11 Would your testimony be true if we  
12 were to make that note, that either/or?

13 MS. MC FAWN: Let me try to clarify. On  
14 April 17th, the board proposed for first notice  
15 revisions to part 742. The joint committee would  
16 not allow us to go to first notice. So on May  
17 1st, we reissued those same revisions but not for  
18 first notice. It was just for the purposes of  
19 docket B and what we could discuss in here.

20 So what Mr. Feinen's asking you is  
21 your testimony refers to our first order which was  
22 for first notice, would that remain the same for  
23 our order as of May 1st?

24 DR. HORNSHAW: Yes.

1                   MR. FEINEN: One more question. When  
2 you're referring to second notice when you're  
3 talking about section 915(I), you're referring to  
4 second notice in R97-12(A)?

5                   DR. HORNSHAW: That's correct.

6                   MR. FEINEN: Thank you.

7                   MS. MC FAWN: Can I ask you before we go  
8 any further, you have before you what's called the  
9 draft of agency proposal which is Exhibit 2,  
10 marked as Exhibit 2.

11                   Does this reflect -- other than the  
12 change in the location of the word "or," does this  
13 exhibit reflect what the agency would propose for  
14 the board concerning the similar-acting  
15 chemicals?

16                   DR. HORNSHAW: Yes.

17                   MS. MC FAWN: So this would reflect what  
18 you testified about in your testimony and the  
19 revisions you sought?

20                   DR. HORNSHAW: Yes.

21                   MS. MC FAWN: Thank you.

22                   HEARING OFFICER FELTON: Mr. Hornshaw,  
23 do you have anything additional you would like to  
24 add in support of the agency's proposal?

1 DR. HORNSHAW: Not at this time.

2 HEARING OFFICER FELTON: Would anyone  
3 else on behalf of the agency like to add anything  
4 additional in support of this proposal?

5 MS. ROBINSON: Not at this time.

6 HEARING OFFICER FELTON: At this time  
7 would you like to move both Exhibits 1 and 2 into  
8 evidence?

9 MS. ROBINSON: Yes, please.

10 HEARING OFFICER FELTON: Are there any  
11 objections to moving Exhibit 1, the testimony of  
12 Thomas C. Hornshaw, and Exhibit 2, the draft  
13 language of the agency proposal prepared on behalf  
14 of the board into evidence at this time?

15 Seeing that there are no  
16 objections, we will move both Exhibit 1 and 2 into  
17 evidence and into the record of both Thomas C.  
18 Hornshaw's testimony and the draft language of the  
19 agency proposal prepared on behalf of the board.

20 MS. ROBINSON: Thank you.

21 (Documents received  
22 in evidence.)

23 HEARING OFFICER FELTON: We will now  
24 proceed with questions for the agency witnesses.

1 As I previously mentioned, if you have any  
2 questions for one of the agency witnesses, please  
3 raise your hand and wait for me to acknowledge  
4 you. When I acknowledge you, please stand and  
5 state in a loud and clear voice your name and the  
6 organization you represent, if any. Are there any  
7 questions at this time? Question.

8 MR. RIESER: My name is David Rieser.  
9 I'm with the law firm of Ross & Hardies. I  
10 represent the Illinois Steel Group and the  
11 Illinois Petroleum Council and I have in all these  
12 proceedings. I have a series of questions to  
13 ask. Some are with respect to the language that's  
14 proposed and some with respect to some of the  
15 concepts. We'll start with easy ones which are on  
16 the language.

17 Looking at Exhibit 2, I'm looking  
18 at page 5 which is 805(c), the language we were  
19 just talking about. This language talks about  
20 mixtures of similar-acting chemicals. Do you see  
21 where I'm referring?

22 DR. HORNSHAW: Yes.

23 MR. RIESER: And would you agree with me  
24 there's no definition of a similar-acting chemical

1 in the rule?

2 DR. HORNSHAW: Other than by having them  
3 listed on the tables that define what are -- what  
4 are target organ/organ systems or similar effects.

5 MR. RIESER: Right. And there was  
6 language which was stricken here in (c) which  
7 talks about chemicals which affect the same target  
8 organ/organ system or similar mode of action, is  
9 that correct?

10 DR. HORNSHAW: That's correct.

11 MR. RIESER: That's what you mean by  
12 similar-acting chemicals?

13 DR. HORNSHAW: Yes.

14 MR. RIESER: Would it be acceptable  
15 instead of saying similar-acting chemicals to say  
16 regarding mixtures of chemical which affect the  
17 same target organ/organ system or similar mode of  
18 action?

19 DR. HORNSHAW: That would be  
20 appropriate.

21 MR. RIESER: Okay. With respect again  
22 looking at Exhibit 2 and actually in that same  
23 section moving down to 1 sub 2 -- 1 sub 2 on page  
24 6, this is language that was in the original --

1 that's in 97-12(A) in the second notice, it says  
2 that, "if the value of the weighted average  
3 calculated in accordance with the equations above  
4 is greater than 1.0, then additional remediation  
5 must be carried out until the level of  
6 contaminants remaining in the remediated area have  
7 a weighted average," et cetera. Do you see where  
8 I'm referring?

9 DR. HORNSHAW: Yes.

10 MR. RIESER: Is it accurate when it says  
11 additional remediation, it may not be necessary to  
12 actually do in-site remediation to achieve these  
13 values, but that one could use the tiered approach  
14 or exclusion of pathways or other methodologies  
15 contained in this entire 742 rule to achieve the  
16 appropriate remediation objectives at the site?

17 DR. HORNSHAW: That's true.

18 HEARING OFFICER FELTON: Do you have  
19 anymore questions at this time?

20 MR. RIESER: Yes, yes. I have a long  
21 list of them, and I'm looking for it.

22 HEARING OFFICER FELTON: If you're more  
23 comfortable sitting down, that's fine.

24 MR. RIESER: Thank you. Looking at the

1 language of 805(d), how exactly is that intended  
2 to work?

3 DR. HORNSHAW: The way we envisioned  
4 this working is if in the investigation for a  
5 site, if any chemical which is on the new table  
6 which we have created, appendix A, table H, those  
7 are carcinogens whose Tier 1 objective exceeds the  
8 1 in 1,000,000 target cancer risk, if any of those  
9 chemicals are detected during the investigation,  
10 then by definition the target or the risk level at  
11 the site is greater than the 1 in 1,000,000 target  
12 that we generally said should apply at all sites;  
13 therefore, that chemical or those chemicals plus  
14 any other chemicals detected at the site which  
15 affect the same target organ in the body, all of  
16 those need to be elevated to a further evaluation  
17 of the mixture effects in a Tier 2 evaluation.  
18 I'm sorry, I've been corrected, any other  
19 chemicals of concern for the site.

20 MR. RIESER: And the evaluation in Tier  
21 2 is according to looking at either 805(c) or --  
22 the procedures identified in either 805(c) or  
23 805(d) as you proposed here, correct?

24 DR. HORNSHAW: Correct.



1 MR. RIESER: 805(c) is sort of the  
2 cumulative effects formula that's sort of been  
3 consistent throughout this rulemaking. It's  
4 appeared in several different places, but it  
5 includes adding the ratio of the chemical to its  
6 Tier 1 cleanup objective together to arrive at an  
7 appropriate weighted average that's used to arrive  
8 at a cleanup objective for both or all of the  
9 mixture of chemicals that you're looking at,  
10 correct?

11 DR. HORNSHAW: Right, and that's only  
12 for chemicals that exceed the Tier 1 remediation  
13 objective.

14 MR. RIESER: Okay.

15 DR. HORNSHAW: The 805(c) part.

16 MR. RIESER: Okay. And that formula was  
17 derived from how the agency dealt with issues that  
18 arose under 620.615 mixtures, correct?

19 DR. HORNSHAW: Correct.

20 MR. RIESER: So that was the formula the  
21 agency came up with to respond to the mixture  
22 issues in 620.615?

23 DR. HORNSHAW: Actually the formula was  
24 to address mixtures in soil which has nothing to

1 do with 615.

2 MR. RIESER: Right, but when you were  
3 looking to apply 615 in this rulemaking, this is  
4 the formula you arrived at?

5 DR. HORNSHAW: Correct.

6 MR. RIESER: Is it also true that in  
7 issues that have arisen under 615 prior to this  
8 rulemaking, you also used this formula, this type  
9 of formula, to address this formula for mixtures  
10 with similar-acting chemicals?

11 DR. HORNSHAW: Yes, unless, for  
12 instance, the entire site was addressed by a  
13 formal risk assessment and then 620.615 was  
14 addressed in the context of the risk assessment  
15 which would be a Tier 3 approach.

16 MR. RIESER: Right. And those would be  
17 the use of the more formalized health advisories  
18 that are provided for in the appendices of 620?

19 DR. HORNSHAW: That is correct.

20 MR. RIESER: 805(d), on the other hand,  
21 you're looking at -- is it correct that you're  
22 looking at substances which are detected, that are  
23 identified detection levels but don't exceed their  
24 Tier 1 cleanup objectives for groundwater,

1 correct?

2 DR. HORNSHAW: It can be that way, yes.

3 MR. RIESER: Well, but it's designed to  
4 be that way?

5 DR. HORNSHAW: Yes.

6 MR. RIESER: For a chemical to be  
7 reviewed under 805(d), it doesn't have to exceed  
8 its Tier 1 level? It's sufficient to exceed its  
9 detection level?

10 DR. HORNSHAW: That's correct.

11 MR. RIESER: Just that it's being  
12 detected?

13 DR. HORNSHAW: Only a detect. It can  
14 be, but it doesn't have to be in exceedence of the  
15 Tier 1 remediation objectives.

16 MR. RIESER: And if it's detected, what  
17 you do is you look for all other chemicals that  
18 might affect the same target organ based on  
19 appendix A, table F, and then identify the  
20 cumulative risk and determine if that cumulative  
21 risk exceeds one times ten -- one times ten to the  
22 minus 4th so 1 in 10,000?

23 DR. HORNSHAW: That's correct.

24 MR. RIESER: How is the cumulative risk

1 determined in that scenario?

2 DR. HORNSHAW: That can be determined in  
3 a couple of ways. In the table in appendix A,  
4 table H, we have given the 1 in 1,000,000 risk  
5 level. So a person could calculate the actual  
6 risk level by a simple ratio of the detected  
7 concentration versus the 1 in 1,000,000 risk  
8 concentration, or they could take that through a  
9 more formal risk assessment approach and actually  
10 calculate the risk of the entire mixture given the  
11 exposure assumptions that are either default in  
12 approach or developed as part of a Tier 3 risk  
13 assessment.

14 MR. RIESER: Is there a specific model  
15 or process that's been identified in the 742 rule  
16 that specifically provides for that second  
17 alternative that you just described?

18 DR. HORNSHAW: Not specifically, no.

19 MR. RIESER: Looking at the first  
20 alternative that you described where you were  
21 adding the ratio, that's the similar formula to  
22 that which is in 805(c) except instead of using  
23 the Tier 1 objective in the denominator --

24 DR. HORNSHAW: Very good, Dave.

1 MR. RIESER: I'm working on it.

2 DR. HORNSHAW: I'm impressed.

3 (Laughter.)

4 MR. RIESER: You use the one in a  
5 millionth value?

6 DR. HORNSHAW: That's correct. The 1 in  
7 1,000,000 cancer risk concentration would be the  
8 denominator.

9 MR. RIESER: So by using that formula,  
10 however, especially with the 1 in 1,000,000 target  
11 risk in the denominator, you may arrive, depending  
12 on which chemicals you have that affect the same  
13 target organ, at values which are orders of  
14 magnitude below the individual Tier 1 groundwater  
15 objectives for those individual substances?

16 DR. HORNSHAW: That is a possibility.

17 MR. RIESER: And the purpose of 805(d)  
18 is to comply with the statutory direction that you  
19 don't have residential standards that are below  
20 one in a million? They have target risks below  
21 one in a million?

22 DR. HORNSHAW: Could you repeat that.

23 MR. RIESER: The purpose of 805(d) is so  
24 that you don't have mixtures of chemicals for a

1 residential site for drinking water that don't  
2 give you a target risk of less than 1 in 1,000,000  
3 for the site?

4 DR. HORNSHAW: No, less than 1 in  
5 10,000.

6 MR. RIESER: 1 in 10,000, thank you.  
7 And the purpose of that is to comply with the  
8 statutory directive?

9 DR. HORNSHAW: That's correct.

10 MR. RIESER: Doesn't the statute also  
11 say at the 805(d) that no groundwater remediation  
12 objective adopted pursuant to the section shall be  
13 more restrictive than the applicable Class I or  
14 Class III groundwater quality standard adopted by  
15 the board?

16 DR. HORNSHAW: Yes.

17 MR. RIESER: So that the statute kind of  
18 has both issues, it has -- it can't be less than 1  
19 in 10,000, but it also has to be no less  
20 restrictive than the groundwater objective?

21 DR. HORNSHAW: I think the statute  
22 intended for that to be any individual chemical.  
23 I don't think it meant a mixture of chemicals.

24 MR. RIESER: Okay. It doesn't state

1 mixtures in describing those two things. I think  
2 that's accurate. The groundwater -- excuse me,  
3 the Tier 1 groundwater cleanup objectives are  
4 based almost entirely on the 620 groundwater  
5 quality standards, correct?

6 DR. HORNSHAW: For the most part, yes.

7 MR. RIESER: And those are based almost  
8 entirely on the maximum contaminant levels  
9 developed by the United States Environmental  
10 Protection Agency?

11 DR. HORNSHAW: Not necessarily. Mostly,  
12 but I wouldn't say almost entirely.

13 MR. RIESER: And the MCLs, maximum  
14 contaminant levels, are not limited by specified  
15 target risk, is that correct?

16 DR. HORNSHAW: For carcinogens, the  
17 target is 1 in 1,000,000 risk, but that target is  
18 tempered by other considerations such as detection  
19 limits, natural occurrence, what I've already  
20 testified to.

21 MR. RIESER: Okay. But the MCL value,  
22 the numbers selected by the USEPA, still reflects  
23 their considered opinion as to what's appropriate  
24 and safe for drinking water for that -- in

1 drinking water for that particular substance?

2 DR. HORNSHAW: That's correct, at least  
3 at the time it was issued.

4 MR. RIESER: And until that's changed by  
5 rulemaking, that remains their opinion?

6 DR. HORNSHAW: Yes.

7 MR. RIESER: If you were just looking at  
8 615 -- I'm sorry, 620.615, mixtures of chemicals  
9 under 620.615, and you didn't have a statutory  
10 directive that you couldn't have a target risk  
11 below one times ten and ten to the minus four,  
12 would you need 805(d)? Would you need this type  
13 of analysis?

14 DR. HORNSHAW: I'm not sure I'm  
15 following your question. Could you repeat that.

16 MR. RIESER: Let me ask it a different  
17 way. Under -- when you were evaluating mixtures,  
18 it's part of your task, your position to evaluate  
19 the question of mixture of similar-acting  
20 substances at sites under 620.615 on behalf of the  
21 agency, correct?

22 DR. HORNSHAW: That's correct.

23 MR. RIESER: If you were doing that task  
24 for a site in the absence of the 742 rulemaking,



1 you would look solely at the type of analysis that  
2 is in 805(c) or a more formal risk assessment if  
3 that was available for the site, is that correct?

4 DR. HORNSHAW: That's correct, and as an  
5 example, if the chemical -- one of the chemicals  
6 in a mixture did not have a groundwater quality  
7 standard as in 620.410, 410, then we would look to  
8 620.615 procedures to establish the denominator to  
9 be used, and in most cases for a carcinogen,  
10 that's going to be a detection limit. You know,  
11 the health advisory for carcinogens in 620.615 is  
12 the lowest detection limit of any of the USEPA  
13 analytical limits. So it would be a detection  
14 limit as the denominator.

15 MR. RIESER: If there was a 410 standard  
16 for that substance, then you would use the 410  
17 standard in that?

18 DR. HORNSHAW: Yes, that would be the  
19 denominator, correct.

20 MR. RIESER: Kind of going back to  
21 805(c) and (d) -- I'm sorry, 805(d), if the  
22 detection limit, the ADL is greater than the  
23 target risk value, then you work from the  
24 detection limit, is that correct?

1 DR. HORNSHAW: That's correct.

2 MR. RIESER: Would you in that  
3 circumstance put the detection limit rather than  
4 the target risk value in the denominator?

5 DR. HORNSHAW: That's correct.

6 MR. RIESER: Just a minute, please. Let  
7 me move on to another area. The agency proposes  
8 that the language the board included in what was  
9 originally their first notice and apparently is no  
10 longer their first notice at 900(f), the move to  
11 915 so that the mixtures of substances are  
12 considered only in the context of formal risk  
13 assessments, is that correct?

14 DR. HORNSHAW: That's correct.

15 MR. RIESER: What was the agency intent  
16 on this point?

17 DR. HORNSHAW: We feel that's the  
18 appropriate place to consider mixture effects is  
19 in the context of a risk assessment.

20 MR. RIESER: Under other features of  
21 Tier 3 such as exclusion of pathways, it really is  
22 not an issue, is that correct?

23 DR. HORNSHAW: That's correct.

24 MR. RIESER: I have no further

1 questions.

2 HEARING OFFICER FELTON: Any other  
3 questions?

4 MR. FEINEN: I have two follow-up  
5 clarification questions based on some of the  
6 questions that Mr. Rieser had for Dr. Hornshaw.

7 When talking about describing in  
8 805(c)(1) (ii), additional remediation, basically  
9 what you're talking about when you're talking  
10 institutional controls and engineered barriers,  
11 you're talking about doing that pursuant to a  
12 different tier, Tier 2 or Tier 3? When you're  
13 saying you don't have to do any further  
14 remediation, you can do institutional control or  
15 an engineered barrier pursuant to Tier 2 or  
16 Tier 3?

17 DR. HORNSHAW: That could be among the  
18 options that could be used to meet the objectives  
19 of this section, yes.

20 MR. FEINEN: And in (d) when you're  
21 talking about carcinogens detected by different  
22 chemicals which exceeded 10 to the minus 6, you  
23 need to go to Tier 2?

24 DR. HORNSHAW: Yes.

1 MR. FEINEN: Could you also go to  
2 Tier 3?

3 DR. HORNSHAW: Yes, you could,  
4 certainly.

5 MR. FEINEN: That's all I have.

6 HEARING OFFICER FELTON: Any other  
7 additional questions?

8 MR. RAO: I have some questions.

9 HEARING OFFICER FELTON: Please proceed,  
10 Mr. Rao.

11 MR. RAO: Dr. Hornshaw, in discussing  
12 the similar-acting substances in soil remediation  
13 objectives under Tier 1, you said that because of  
14 the inherently conservative nature of the  
15 remediation objectives that you don't need to  
16 consider the effects of similar-acting  
17 substances.

18 Can you explain how it's different  
19 under Tier 2 for soil remediation objectives if  
20 somebody's using the SSL procedure in the Tier 2,  
21 you know, does the conservative nature changes in  
22 Tier 2 to Tier 1?

23 DR. HORNSHAW: It's less conservative in  
24 that we're not making assumptions that are

1 protective of greater than 95 percent of the  
2 entire country in Tier 2. In Tier 2 you're making  
3 consideration of site specific factors that should  
4 still be protective, but the extra layer of  
5 conservatism is not there anymore.

6 MR. RAO: Because in your earlier  
7 testimony in docket A, you were saying that, you  
8 know, essentially both were in a -- the procedure  
9 for SSL was essentially the same except for the  
10 site specific numbers that they were going to use  
11 in the equations, all the safety factors built in  
12 are still the same. So just curious, you know,  
13 how it changes.

14 DR. HORNSHAW: I think we said equally  
15 protective. I don't think we ever said equally  
16 conservative.

17 MR. RAO: Do any of the safety factors,  
18 whatever that you talk about, inherently  
19 conservative, when you say it, does it change  
20 other than those parameters listed in one of the  
21 tables that they can get it using site specific  
22 numbers?

23 DR. HORNSHAW: Could you repeat that?

24 MR. RAO: Yeah. You see, what I'm

1 trying to get at is they're using the same  
2 equations. If they use the default numbers,  
3 they're supposed to get the Tier 1 numbers?

4 DR. HORNSHAW: That's correct, right.

5 MR. RAO: So if they use site specific  
6 numbers, how does it change the conservative  
7 nature of the remediation objective?

8 DR. HORNSHAW: I guess I can answer that  
9 by giving an example. When you're considering  
10 transport of the chemicals from soil to the point  
11 of exposure, one of the key assumptions is the  
12 amount of organic carbon which is in the soil to  
13 retard that transport, and it is conservatively  
14 assumed in Tier 1 that there's less than one  
15 percent organic carbon in the soil.

16 The specific value is .6 for  
17 surface soils and .2 percent for subsurface soils,  
18 when in reality most soils are greater than one  
19 percent, and if you plug in the site specific  
20 value into the calculation, you get a number  
21 that's quite a bit different from the Tier 1  
22 lookup value, at least for the chemical -- the  
23 pathways that have a migration component to them.

24 You know, the direct ingestion

1 pathway, there's no difference because there's no  
2 transport. You are just eating the soil straight  
3 up. That's an example where there's additional  
4 conservatism in the Tier 1 number that is no  
5 longer -- it's replaced by site specific data in  
6 the Tier 2 evaluation.

7 MR. RAO: Okay. I have one more  
8 question.

9 DR. HORNSHAW: And I might add, you  
10 don't have that level of conservatism in the Tier  
11 1 value for groundwater because you don't have the  
12 transport. We are assuming that a person is  
13 drinking that water directly the same as if  
14 they're eating the soil directly.

15 MR. RAO: On going to your proposed  
16 changes under 742.505(b)(3)(A), under these  
17 proposed changes, are you saying that for Tier 1  
18 groundwater objectives, that the effect of  
19 mixtures of similar-acting substances which are  
20 noncarcinogens may not be considered under Tier  
21 1?

22 Because the way it's proposed, you  
23 say if the Tier 1 groundwater remediation  
24 objective listed in table -- appendix B, table E

1 is not exceeded, you know, 620.615 requirements  
2 are met. So if you have carcinogen --  
3 noncarcinogens like ethyl benzene and toluene,  
4 which are at their remediation objectives, then  
5 they still exceed the hazard index of one, but  
6 according to what you propose, you know, they met  
7 the 620.615 requirements.

8 DR. HORNSHAW: We've agreed with the  
9 advisory committee that there is enough  
10 conservatism built into the development of the  
11 Tier 1 remediation objectives, other than for  
12 those chemicals that already exceed the 1 in  
13 1,000,000 risk level, that we're not going to look  
14 at the effect of mixtures in Tier 1.

15 MR. RAO: So basically what you're  
16 saying is in Tier 1 for groundwater, you are going  
17 to look at only for carcinogens, you know, which  
18 are higher than one in a million cancer risk,  
19 right, and you're not going to consider  
20 noncarcinogens under Tier 1?

21 DR. HORNSHAW: If they exceed the Tier 1  
22 remediation objective, any chemical exceeds, then  
23 that chemical, plus any other chemical that  
24 affects the same target, get elevated to a Tier 2



1 evaluation to make sure that the mixture effect is  
2 not of concern.

3 MS. MC FAWN: Just so I understand, so  
4 you are saying that under Tier 1, you want the  
5 board to consider noncarcinogenic ones as well as  
6 carcinogenic ones?

7 DR. HORNSHAW: If they exceed the Tier 1  
8 remediation objective, yes, then that chemical  
9 plus any others that affect the same target go to  
10 a Tier 2 evaluation for groundwater.

11 MS. MC FAWN: Yes, I was talking  
12 groundwater as well.

13 MR. FEINEN: So what you're saying,  
14 Dr. Hornshaw, is that for a noncarcinogen, you  
15 don't look at the cumulative effects until it  
16 exceeds its Tier 1 number?

17 DR. HORNSHAW: That's correct.

18 MR. FEINEN: And then if it does exceed  
19 its Tier 1 number, you look to see if there's any  
20 other chemicals that similarly act and then it  
21 gets kicked into Tier 2?

22 DR. HORNSHAW: That's correct.

23 MS. MC FAWN: So you only get to the  
24 additivity question if it exceeds?

1 DR. HORNSHAW: Right.

2 MS. HENNESSEY: Would you be kicked out  
3 of Tier 1 if it didn't meet the Tier 1 groundwater  
4 objective anyway?

5 DR. HORNSHAW: No. I think they would  
6 be allowed to do other things or try to remediate  
7 to the objective for that chemical only.

8 MS. HENNESSEY: I see.

9 DR. HORNSHAW: But if there's other  
10 chemicals that affect the same target, then all of  
11 those chemicals go to another level of evaluation  
12 to make sure that the mixture of chemicals is not  
13 unacceptable.

14 HEARING OFFICER FELTON: Mr. Rieser.

15 MR. RIESER: Dr. Hornshaw, when you  
16 talked about the conservatisms that are built into  
17 the noncarcinogenic values, can you give us an  
18 example of the levels of conservatism that you're  
19 talking about.

20 DR. HORNSHAW: This wasn't discussed a  
21 whole lot in the meeting with the advisory  
22 committee, but the way the maximum contaminant  
23 levels for noncarcinogens is developed is similar  
24 to the approach that we have for health advisories

1 for noncarcinogens in that there's consideration  
2 given to relative source contribution, which  
3 accounts for exposure to a chemical from other  
4 sources than drinking water, and so that factor is  
5 kind of built in as a level of conservatism so  
6 that the amount that's allowable in drinking water  
7 is usually less than the hazard index of one to  
8 account for other exposures during a person's  
9 daily activities, work, home, whatever.

10 So there is that level of  
11 conservatism built in. There aren't levels of  
12 conservatism built in for transport, as I  
13 discussed, because we're assuming the person is  
14 exposed directly.

15 MR. RIESER: There are also levels of  
16 conservatism built into that value based on the  
17 assumption that a person is of a certain weight  
18 and is drinking a certain quantity of water per  
19 day over a certain period of years, 30, 40 years,  
20 is that correct?

21 DR. HORNSHAW: 30 years or 70 years. It  
22 depends on when the MCL was issued.

23 MR. RIESER: That's also an example of  
24 some of the conservatism that's in those values?

1 DR. HORNSHAW: That's correct.

2 MR. RAO: Those things don't change in  
3 Tier 2, also, right?

4 DR. HORNSHAW: No, they don't. Those  
5 are built into the process all the way through,  
6 and a similar statement could be made for the  
7 toxicity data themselves. Those conservatisms are  
8 there for all chemicals, all tiers.

9 HEARING OFFICER FELTON: Are there any  
10 further questions at this time?

11 MS. HENNESSEY: I have a couple.

12 HEARING OFFICER FELTON: Sure.

13 MS. HENNESSEY: Dr. Hornshaw, I have a  
14 question on 742.915(h). The first sentence of the  
15 agency's proposed language reads, quote, "The  
16 contaminants of concern which affect the same  
17 target organ/organ system or similar mode of  
18 action shall be specifically addressed." Can you  
19 expand on how that is to be addressed.

20 DR. HORNSHAW: There is guidance in  
21 USEPA documents for conducting risk assessments at  
22 Super Fund sites, for instance, that tell the  
23 responsible party how to address mixture of the  
24 carcinogens. Typically, you would -- well,

1 carcinogens and noncarcinogens, you would go  
2 through some evaluation of exposure through all  
3 routes and then sum up the total exposure and then  
4 compare that against the acceptable exposure, and  
5 for mixtures, those similar effects are just  
6 added.

7                   So if you've got two chemicals that  
8 affect the liver, for instance, you would evaluate  
9 the exposure to that chemical through all routes  
10 that are relevant at a site, do the same thing for  
11 the second chemical, and you would develop either  
12 a hazard index based on comparison of the total  
13 exposure to the acceptable exposure, do the same  
14 thing for the second chemical, and then you just  
15 add the hazard index or overall hazard quotient,  
16 and if it's a noncarcinogen, after you've added  
17 those values, still less than 1.0, then the  
18 mixture is acceptable, and similarly for  
19 carcinogens, if the total risk is greater than one  
20 in a million, then you have a situation that needs  
21 to be evaluated further.

22                   MS. HENNESSEY: Okay. So in any event,  
23 under this section 742.915(h), the risk is going  
24 to be quantified?

1 DR. HORNSHAW: Oh, yes. We would fully  
2 expect that in a formal risk assessment.

3 MS. HENNESSEY: Okay. A question on 805  
4 -- I guess 505(b) as well as 805(c) and (d), you  
5 used the phrase, the requirements of section  
6 620.615, and specified when those are met.

7 Just for clarification, do I  
8 understand this to mean that if you look at  
9 620.615(b), it refers you to procedures set forth  
10 in appendices A, B and C of part 620.

11 DR. HORNSHAW: I'm sorry, I'm at 615.  
12 What exactly are you referring to?

13 MS. HENNESSEY: 620.615(b) says that, if  
14 there are mixtures of similarly-acting chemical  
15 substances, you evaluate them according to the  
16 procedure set forth in appendices A, B and C of  
17 part 620?

18 DR. HORNSHAW: Correct.

19 MS. HENNESSEY: Okay. And the language  
20 that you proposed for 742 in these various spots,  
21 505 and 805, would substitute the procedures in  
22 742 for the procedures set forth in appendices A,  
23 B and C of part 620?

24 DR. HORNSHAW: Yes. We envision that

1 everything that we put in 742 would satisfy the  
2 requirements of 615(a) where it just says, "The  
3 need for additional health advice shall be  
4 determined by the agency," and in the context of  
5 742, this is how we're determining it.

6 MS. HENNESSEY: Okay. What is the  
7 effect of the language you proposed on  
8 620.615(b)?

9 DR. HORNSHAW: I guess it kind of  
10 supplants that.

11 MS. HENNESSEY: Okay.

12 HEARING OFFICER FELTON: Are there any  
13 additional questions. Mr. Feinen?

14 MR. FEINEN: Just a clarification. In  
15 responding to one of Ms. Hennessey's questions,  
16 you mentioned some guidance documents by USEPA.  
17 I'm wondering if those guidance documents are  
18 incorporated by 97-12(A).

19 DR. HORNSHAW: Yes, they are, Risk  
20 Assessment Guidance for Super Fund and Exposure  
21 Factors Handbook, and I think there's -- there may  
22 be others. There are two specifically in there  
23 that give guidance on how that's to be done.

24 MR. FEINEN: Thank you.

1 MS. HENNESSEY: Just one grammatical  
2 question, 742.505(d), both sentences start out,  
3 "sites which do not meet." Would it be more  
4 appropriate to say that the language would be,  
5 "sites that do not meet"?

6 DR. HORNSHAW: I believe so, yes.

7 MS. HENNESSEY: Okay. I just took a  
8 grammar seminar, sorry. I don't have anything  
9 else.

10 HEARING OFFICER FELTON: Board Member  
11 Hennessey, you were referring to 505(b)(4)?

12 MS. HENNESSEY: That's correct, yes.

13 HEARING OFFICER FELTON: Thank you. Are  
14 there any other additional questions at this  
15 time?

16 MS. MC FAWN: Why don't we take a break  
17 and go.

18 HEARING OFFICER FELTON: Take a brief  
19 10-minute break. We will readjournal at about  
20 11:30.

21 (Recess taken.)

22 HEARING OFFICER FELTON: Back on the  
23 record. Are there any further questions for the  
24 agency at this time? Seeing none, as we have



1 completed earlier -- actually one follow-up  
2 question or one comment I want to make is would  
3 anyone today like to testify in support or in  
4 opposition to this rulemaking?

5 As we have ended or come to a close  
6 of this, it appears that we will not need the  
7 hearing scheduled for tomorrow. So that hearing  
8 is canceled. Please note that the second hearing  
9 for this proposed rule in docket B has been  
10 scheduled and will proceed on Thursday, May 29th,  
11 1997, in Springfield at 10:00 a.m. in the Lincoln  
12 room in the Stratton Building.

13 The hearing may be continued on the  
14 record to Friday, May 30th, 1997, at that same  
15 time in a location necessary to accommodate any  
16 questions or additional testimony that provides  
17 us. Excuse me, that would be the Howlett  
18 Building. Is there anyone at this time that knows  
19 that they will be testifying at the May 29th  
20 hearing? And if so, just let us know at this  
21 time. Does anyone anticipate that they will be  
22 testifying next week?

23 Please note that if you are  
24 testifying or if you would like to submit prefiled

1 testimony, pursuant to my hearing officer order  
2 dated May 2nd, 1997, all other testimony that  
3 would be prefiled must be filed by May 23rd,  
4 1997. There's no requirement to prefile testimony  
5 for the May 29th, 1997, hearing, and this will not  
6 preclude you if you fail to testify at that time.  
7 The mailbox will set forth 35 Illinois  
8 Administrative Code 101. 102(d) will not apply to  
9 these filings.

10 Are there any other matters that  
11 need to be addressed at this time? We would like  
12 to note at this time that the agency will not be  
13 at this time preparing a draft or a language draft  
14 proposal of the rules. We will be relying at this  
15 time on Exhibit 2. If that changes at the second  
16 hearing, we will address that issue at that time.

17 MS. HENNESSEY: That would be Exhibit 2  
18 as corrected by Dr. Hornshaw's testimony?

19 HEARING OFFICER FELTON: Correct.  
20 Seeing that there are no other further questions  
21 at this time, I would like to thank everyone for  
22 being prepared for this first hearing, and this

23  
24

1 hearing is hereby adjourned. We look forward to  
2 seeing you all in Springfield on May 29th. Thank  
3 you.

4 (Which were all the proceedings  
5 had in the above-entitled case.)

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ILLINOIS POLLUTION CONTROL BOARD

LISA H. BREITER, CSR, RPR, CRR, being first duly sworn, on oath says that she is a court reporter doing business in the City of Chicago; that she reported in shorthand the proceedings at the taking of said hearing and that the foregoing is a true and correct transcript of her shorthand notes so taken as aforesaid, and contains all of the proceedings had at said hearing.

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