

ILLINOIS POLLUTION CONTROL BOARD

April 16, 1998

IN THE MATTER OF:)	
)	
TIERED APPROACH TO)	R97-12(C)
CORRECTIVE ACTION)	(Rulemaking - Land)
OBJECTIVES: AMENDMENTS)	
TO 35 ILL. ADM. CODE 742)	

Proposed Rule. Second Notice.

OPINION AND ORDER OF THE BOARD (by M. McFawn, J. Yi):

The Board today proposes for second notice amendments to 35 Ill. Adm. Code 742: Tiered Approach to Corrective Action Objectives, also known as TACO. Specifically, the amendments include several technical revisions to Appendix A.Table H, Appendix B.Table C, Appendix B.Table D, and Appendix C.Table I¹ as well as some nonsubstantive clarifications to Sections 742.210, 742.310, and 742.900.

PROCEDURAL HISTORY

On December 3, 1997, in Docket B of this rulemaking, the Site Remediation Advisory Committee (SRAC) and the Illinois Environmental Protection Agency (Agency), filed a "Joint Motion to Correct" (joint motion) Appendix A.Table H entitled "Chemicals Whose Tier 1 Class I Groundwater Remediation Objective Exceeds the 1 in 1,000,000 Cancer Risk Concentration" (Table H). In their joint motion, the SRAC and the Agency assert that, upon reviewing the numeric contaminant levels set forth under the 1 in 1,000,000 cancer risk concentration included within Table H, they determined that those numeric contaminant levels are based upon a 70 year exposure duration. The SRAC and the Agency maintain that the use of a 70 year exposure duration as a basis for the Table H levels, rather than a 30 year exposure duration, was not intended. Finally, the SRAC and the Agency contend that the use of the 70 year exposure duration as a basis for the Table H levels is technically inconsistent with other aspects of 35 Ill. Adm. Code 742, which are based on a 30 year exposure duration.

At that point in the this rulemaking process, the Board could not correct Table H. See 4 ILCS 5/-40(c),(d) (1994). Accordingly, on December 4, 1997, the Board adopted Docket B

¹ At first notice, the Board also opened Appendix B.Table F and Sections 742.415, 742.510, 742.810, and 742.1015 to make what it perceived were nonsubstantive typographical changes. However, upon further review of this matter, the Board determined that no such typographical amendments were necessary. As no other changes were suggested, the Board has not considered any amendments to the aforementioned appendix and sections. Accordingly, they are not included within the attached order.

as final and ordered the rules filed with the Secretary of State. See In the Matter of: Tiered Approach to Corrective Action Objectives: Amendments to Part 742 (December 4, 1997), R97-12(B). Also, on December 4, 1997, the Board adopted a first notice proposal in this docket C to consider the merits of the joint motion and also to make some non-substantive grammatical, typographical, and mechanical changes that were identified after the adoption of Docket A in this rulemaking. 21 Ill. Reg. 16982 (December 26, 1997). The joint motion filed in Docket B has been incorporated as public comment 1.

One hearing was held in this matter on January 12, 1998, in Springfield. No additional public comments were filed with the Board. Dr. Thomas Hornshaw and Tracey Virgin Hurley, Environmental Toxicologists with the Office of Chemical Safety, testified on behalf of the Agency. Mark Marszalek testified on behalf of Andrews Environmental Engineering. Harry Walton, Chairman of the Site Remediation Advisory Committee (SRAC), testified on behalf of the Illinois State Chamber of Commerce and on retainer to the Illinois Environmental Regulatory Group (IERG). Whitney Wagner Rosen was present on behalf of the Illinois Environmental Regulatory Group. The first notice public comment period in this matter ended on February 9, 1998.

Pursuant to Public Act 90-489, effective January 1, 1998, the Board requested that the Department of Commerce and Community Affairs (DCCA) conduct an economic impact study for this proposed rulemaking. DCCA has 30 to 45-days after such request to produce a study of the economic impact of the proposed rules. On January 26, 1998, DCCA issued a letter notifying the Board that it would not conduct an economic impact study on this proposed rule because it lacked the technical and financial resources to conduct any economic studies on rules pending before the Board during the remainder of fiscal year 1998. On March 17, 1998, the Board conducted a public hearing in Springfield to entertain any comments regarding the economic impact of this proposed rulemaking. No public comments were received. The Board will proceed to second notice in this proposed rulemaking.

ANALYSIS

Section 742.210

Section 742.210 lists the documents incorporated by reference into the Board's regulations. At first notice, the Board proposed to make one nonsubstantive typographical correction in Section 742.210(a) to the SW-846 reference. At hearing, however, Ms. Hurley testified that in addition to the typographical correction, another revision was necessary to the SW-846 reference. Ms. Hurley testified that on June 13, 1997, Update III to the SW-846 reference was formally adopted (62 Fed. Reg. 32452 (June 13, 1997)). Tr. at 11. Ms. Hurley noted that the SW-846 reference is a dynamic document that changes when new data and advances in analytical techniques are incorporated into the manual in the form of new or revised methods. Tr. at 11. By publishing the announcement in the Federal Register, the United States Environmental Protection Agency (USEPA) has made Update III officially part of the SW-846 reference. Accordingly, the SW-846 incorporation by reference should read as follows:

“Test Methods for Evaluation Solid Waste, Physical/Chemical Methods,” USEPA Publication number SW-846 (Third Edition, ~~November 1986~~Final Update III, December 1996), as amended by Updates I,~~and~~ IIA, and III (Document No. 955-011-00000-1)(contact USEPA, Office of Solid Waste, for Update ~~IIA~~III).

The Board agrees that the aforementioned changes should be made to the SW-846 reference listed at Section 742.210, and therefore makes the necessary revisions in this Section.

Section 742.310

At first notice, the Board on its own motion amended Section 742.310(b)(1)(A) to add the phrase “within ten feet of” after “[t]he concentration of any contaminant of concern” and after “the land surface or.” At hearing, the Board questioned the Agency and public whether it had any opposition to this amendment. Tr. at 18-19. Mr. Hurley responded that the Agency had no such objection and that it was its intent to include that phrase in this Section for clarification purposes. Tr. at 19. Accordingly, the Board adopts these amendments for second notice at Section 742.310(b)(1)(A).

Section 742.805

Since first notice, the Agency has proposed that the Board amend provisions of Section 742.805 to further clarify how similar-acting contaminants are to be evaluated under this rule. Unfortunately, because Section 742.805 was not opened at first notice on December 4, 1997, the changes offered by the Agency cannot be adopted under this docket. According to the Administrative Procedure Act, the Board is restricted to addressing only those sections that were opened at first notice. 5 ILCS 100/5-40(b), (c) (1994). Because we find the Agency’s explanation correct, we include the following discussion to assist those using this provision of Part 742.

First, the Agency proposes that Section 742.805(c) be amended to clarify that the equation set forth in Section 742.805(c)(1) should be used for evaluating mixtures of similar-acting noncarcinogenic contaminants of concern. Tr. at 11. Second, the Agency proposes a similar amendment to Section 742.805(d) to clarify that the provisions of subsection (d) should be used for evaluating mixtures of similar-acting carcinogenic contaminants of concern.

Third, the Agency proposes another amendment to subsection (d) that specifies how to assess mixtures of similar-acting carcinogenic contaminants of concern. This amendment would allow the use of the weighted average procedure set forth in Section 742.805(c)(1) with some modification to demonstrate that the cumulative risk posed by mixtures of similar-acting carcinogenic contaminants of concern does not exceed 1 in 10,000. Essentially, the modification to the weighted average equation under Section 742.805(c)(1) would require the term CUO_{xa} in the equation to be either Tier 1 or Tier 2 objectives, or for those contaminants listed in Appendix A. Table H, the 1 in 1,000,000 risk level concentrations.

In response to a Board question regarding the practical effect if these suggested changes are not made, Ms. Hurley testified that the language as it currently exists in Section 742.810 is “just a little vague.” Tr. at 17. She noted that, based on several outside requests for clarification of this Section, absent the proposed clarifications, those using Part 742 may continue to be confused about how to assess mixtures of similar-acting substances and how to use Appendix A.Table H. Tr. at 17-18.

Again, the Board shares the Agency’s desire to further clarify the TACO scheme. However, the Board must decline to make these suggested changes in Section 742.805 due to rulemaking requirements under the Administrative Procedure Act. The Board suggests that the Agency propose this change in a future rulemaking.

Section 742.900

At first notice, the Board on its own motion, proposed that Section 742.900(c) be amended to make one nonsubstantive, typographical correction. As no one expressed an objection to this suggested change, the Board finds that this change is warranted.

Appendix A.Table H

Appendix A.Table H (Table H) lists chemicals whose Tier 1 Class I groundwater remediation objective exceeds the 1 in 1,000,000 cancer risk concentration. The Agency suggests two corrections be made to Appendix A.Table H.

First, the Agency proposes that the 1 in 1,000,000 cancer risk concentrations be based upon an exposure duration period of 30 years. Currently, the values listed there are based upon a 70 year exposure duration. The Agency explained in its prefiled testimony and at hearing that when it originally calculated the 1 in 1,000,000 cancer risk concentrations in Table H, using Equation R25 as set forth in Section 742.Appendix C.Table C, it used an incorrect exposure duration of 70 years instead of an exposure duration of 30 years, as specified in Section 742.Appendix C.Table D. Tr. at 10 and Prefiled Testimony at 3. The values in Table H should be based on an exposure duration of 30 years, which is the value specified in Appendix C.Table D for Equation R25. Tr. at 10. Both the American Society of Testing Material (ASTM) Guidance and the USEPA’s SSL Guidance specify a residential exposure duration of 30 years. Finally, the Ms. Hurley testified that the Agency had always intended to calculate these levels based on a 30 year exposure duration. Tr. at 10.

Second, the Agency proposes that three chemicals, namely, Bis(2-ethylhexyl)phthalate, N-Nitrosodiphenylamine, and 2,4,6-Trichlorophenol be deleted from Appendix A.Table H. Tr. at 10. The Agency explained at hearing that after revising the values listed in Table H to reflect a 30 year exposure period, the Tier 1 Class I groundwater remediation objectives for the aforementioned chemicals no longer exceed the 1 in 1,000,000 cancer risk concentrations. Tr. at 10. Consequently, the Agency proposes deleting those chemicals from Table H. Tr. at 10.

Finally, Mark Marszalek testified at hearing that a typographical error should be corrected in Table H for the constituent: benzopyrene. Tr. at 12. Mr. Marszalek explained that the value for benzopyrene should be 0.000012 rather than 0.0000012. Tr. at 12. The Agency agreed with Mr. Marszalek's suggested change.

The Board agrees with the Agency and Mr. Marszalek that a 30 year residential exposure duration is consistent with the Agency's intent, as well as ASTM and USEPA guidance. Accordingly, the cancer risk concentration values listed are corrected in Table H. The Board also agrees that the three aforementioned chemicals should be deleted from Appendix A. Table H as their Tier 1 Class I groundwater remediation objectives no longer exceed the 1 in 1,000,000 cancer risk concentration. Finally, the Board agrees with Mr. Marszalek's testimony that the value for benzopyrene should be 0.000012 and therefore corrects the value for this chemical. The attached Board order reflects the foregoing revisions.

Appendix B. Table C

Appendix B. Table C lists pH specific soil remediation objectives for inorganics and ionizing organics for the soil component of the groundwater ingestion route (Class I groundwater). The Agency requests that a value for the organic, 2,4,6-Trichlorophenol, be amended to correct a typographical error. Tr. at 13. No objection has been received concerning this proposed correction. The Board finds this nonsubstantive change proper and will correct the typographical error.

Appendix B. Table D

Appendix B. Table D lists pH specific soil remediation objectives for inorganics and ionizing organics for the soil component of the groundwater ingestion route (Class II groundwater). The Agency requests that the soil remediation objectives for 2,4,6-Trichlorophenol be changed for the six pH ranges ranging from: 4.5-4.74 to 6.65-6.89. Tr. at 14. Dr. Hornshaw testified that, upon conferring with Mr. Marszalek, he learned that these changes are necessary to account for how the Agency in the past has derived the equivalent of a health advisory for Class II groundwater. Tr. at 15. For those chemicals that do not have a Class II groundwater standard under Part 620, the Class II health advisory is used as a substitute for the Part 620 standard in determining soil remediation objectives. Exh. 5 at 22.

The Agency has explained how a Class II health advisory for a chemical is determined more clearly in its testimony under Docket A rules. In determining the Class II health advisory, the Agency relied on the rationale behind the Part 620 Class II standards, *i.e.*, the potential for removal of a chemical from groundwater by common drinking water treatment techniques. Exh. 5 at 22. The Agency noted that the potential for removal of a chemical from groundwater is determined by comparing the organic carbon partition coefficient (K_{oc}) of that chemical with that of a benchmark chemical, ethylbenzene. Exh. at 23. If the K_{oc} of a chemical of interest is greater than that of ethylbenzene, then the chemical is considered to be removable from groundwater. Further, the Agency noted that if a chemical is removable from groundwater then the Class II health advisory is five times the Class I health advisory. If the

chemical is not readily removable from groundwater, then the Class II health advisory is the same as the Class I advisory.

In case of ionizing compounds like 2,4,6-Trichlorophenol, the organic carbon partition coefficient changes with pH. Tr. at 15. In terms of deciding whether to multiply the Class I health advisory by five times or by one time depending whether it is or is not mobile in soil, the Agency stated that there is a break point between pH 6.65 and pH 6.9 that crosses over that threshold comparison against the organic carbon partition coefficient for ethylbenzene. Tr. at 15-16. The Agency agreed with Mr. Marszalek that the organic carbon partition coefficient of 2,4,6-Trichlorophenol changes from lower than that of ethylbenzene to higher than that of ethylbenzene. Tr. at 16. Therefore, 2,4,6-Trichlorophenol is removable from groundwater below the breakpoint value, and the correct soil remediation objective is the Class II health advisory, which is five times the Class I health advisory. The original values on Table D did not reflect this; they were the Class I health advisory numbers. Consequently, the Agency recommends correcting the soil remediation objectives for 2,4,6-Trichlorophenol by multiplying each value at pH ranges lower than the breakpoint value, i.e., 6.9, by five.

The Board agrees that the pH based soil remediation objectives for 2,4,6-Trichlorophenol must be corrected to account for the manner in which the Agency has derived the Class II health advisory. The Board notes that in Appendix C, Table I, the K_{oc} for 2,4,6-Trichlorophenol changes from higher than that of ethylbenzene at pH of 6.8 to lower than that of ethylbenzene at pH of 6.9². Therefore, at pH ranges below 6.9, 2,4,6-Trichlorophenol is considered to be removable from groundwater and its Class II health advisory is five times the Class I advisory. In light of this, the Board finds that the soil remediation objectives in Appendix B, Table D for 2,4,6-Trichlorophenol must be corrected at pH ranges lower than 6.9 by multiplying them by five.

Appendix C, Table I

Appendix C, Table I lists K_{oc} values for ionizing organics as a function of pH. The Agency requests that four calculations starting with pH 4.5 to pH 4.8 be amended for the organic, dinoseb. Tr. at 16. Dr. Hornshaw testified at hearing that these suggested amendments are typographical changes necessary for purposes of clarification. Tr. at 16. The Board agrees with the Agency and accordingly makes the necessary amendments.

CONCLUSION

The Board today adopts for second notice amendments to 35 Ill. Adm. Code 742. The amendments include several technical revisions to Appendix A, Table H, Appendix B, Table C, Appendix B, Table D, and Appendix C, Table I as well as some nonsubstantive clarifications to Sections 742.210, 742.310, and 742.900.

² K_{oc} of 2,4,6-Trichlorophenol is 381 L/kg at pH 6.8 and 338 L/kg at pH 6.9. K_{oc} of ethylbenzene is 363 L/kg.

The Board notes that Mr. Marszalek and others have identified various minor typographical and technical discrepancies in Part 742. The Board appreciates these efforts to thoroughly review and identify additional errors within the TACO framework. Unfortunately, as previously noted, the Board is constrained from making any amendments in sections not opened at first notice. The Board, therefore, cannot make any of the additional changes suggested by Mr. Marszalek at hearing. To the extent that the changes Mr. Marszalek and others suggest are necessary, the Board encourages Mr. Marszalek, other members of the regulated community, and the Agency to take the time to compile all additional amendments and submit a new proposal for rulemaking to the Board at the appropriate time.

ORDER

The Board directs the Clerk of the Board to cause the submission of the following proposal to the Joint Committee on Administrative Rules:

TITLE 35: ENVIRONMENTAL PROTECTION SUBTITLE G: WASTE DISPOSAL CHAPTER I: POLLUTION CONTROL BOARD SUBCHAPTER f: RISK BASED CLEANUP OBJECTIVES

PART 742 TIERED APPROACH TO CORRECTIVE ACTION OBJECTIVES

SUBPART A: INTRODUCTION

Section	
742.100	Intent and Purpose
742.105	Applicability
742.110	Overview of Tiered Approach
742.115	Key Elements
742.120	Site Characterization

SUBPART B: GENERAL

Section	
742.200	Definitions
742.205	Severability
742.210	Incorporations by Reference
742.215	Determination of Soil Attenuation Capacity
742.220	Determination of Soil Saturation Limit
742.225	Demonstration of Compliance with Remediation Objectives
742.230	Agency Review and Approval

SUBPART C: EXPOSURE ROUTE EVALUATIONS

Section	
742.300	Exclusion of Exposure Route
742.305	Contaminant Source and Free Product Determination
742.310	Inhalation Exposure Route
742.315	Soil Ingestion Exposure Route
742.320	Groundwater Ingestion Exposure Route

SUBPART D: DETERMINING AREA BACKGROUND

Section	
742.400	Area Background
742.405	Determination of Area Background for Soil
742.410	Determination of Area Background for Groundwater
742.415	Use of Area Background Concentrations

SUBPART E: TIER 1 EVALUATION

Section	
742.500	Tier 1 Evaluation Overview
742.505	Tier 1 Soil and Groundwater Remediation Objectives
742.510	Tier 1 Remediation Objectives

SUBPART F: TIER 2 GENERAL EVALUATION

Section	
742.600	Tier 2 Evaluation Overview
742.605	Land Use
742.610	Chemical and Site Properties

SUBPART G: TIER 2 SOIL EVALUATION

Section	
742.700	Tier 2 Soil Evaluation Overview
742.705	Parameters for Soil Remediation Objective Equations
742.710	SSL Soil Equations
742.715	RBCA Soil Equations
742.720	Chemicals with Cumulative Noncarcinogenic Effects

SUBPART H: TIER 2 GROUNDWATER EVALUATION

Section	
742.800	Tier 2 Groundwater Evaluation Overview
742.805	Tier 2 Groundwater Remediation Objectives
742.810	Calculations to Predict Impacts from Remaining Groundwater Contamination

SUBPART I: TIER 3 EVALUATION

Section

742.900	Tier 3 Evaluation Overview
742.905	Modifications of Parameters
742.910	Alternative Models
742.915	Formal Risk Assessments
742.920	Impractical Remediation
742.925	Exposure Routes
742.930	Derivation of Toxicological Data

SUBPART J: INSTITUTIONAL CONTROLS

Section

742.1000	Institutional Controls
742.1005	No Further Remediation Letters
742.1010	Restrictive Covenants, Deed Restrictions and Negative Easements
742.1015	Ordinances
742.1020	Highway Authority Agreements

SUBPART K: ENGINEERED BARRIERS

Section

742.1100	Engineered Barriers
742.1105	Engineered Barrier Requirements

APPENDIX A General

ILLUSTRATION A Developing Soil Remediation Objectives Under the Tiered Approach

ILLUSTRATION B Developing Groundwater Remediation Objectives Under the Tiered Approach

Table A Soil Saturation Limits (C_{sat}) for Chemicals Whose Melting Point is Less Than 30°C

Table B Tolerance Factor (K)

Table C Coefficients $\{A_{N-I+1}\}$ for W Test of Normality, for $N = 2(1)50$

Table D Percentage Points of the W Test for $N = 3(1)50$

Table E Similar-Acting Noncarcinogenic Chemicals

Table F Similar-Acting Carcinogenic Chemicals

Table G Concentrations of Inorganic Chemicals in Background Soils

Table H Chemicals Whose Tier 1 Class I Groundwater Remediation Objective Exceeds the 1 in 1,000,000 Cancer Risk Concentration

APPENDIX B Tier 1 Tables and Illustrations

ILLUSTRATION A Tier 1 Evaluation

Table A Tier 1 Soil Remediation Objectives for Residential Properties

Table B	Tier 1 Soil Remediation Objectives for Industrial/Commercial Properties
Table C	pH Specific Soil Remediation Objectives for Inorganics and Ionizing Organics for the Soil Component of the Groundwater Ingestion Route (Class I Groundwater)
Table D	pH Specific Soil Remediation Objectives for Inorganics and Ionizing Organics for the Soil Component of the Groundwater Ingestion Route (Class II Groundwater)
Table E	Tier 1 Groundwater Remediation Objectives for the Groundwater Component of the Groundwater Ingestion Route
Table F	Values Used to Calculate the Tier 1 Soil Remediation Objectives for the Soil Component of the Groundwater Ingestion Route
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ILLUSTRATION B	Tier 2 Evaluation for Groundwater
ILLUSTRATION C	US Department of Agriculture Soil Texture Classification
Table A	SSL Equations
Table B	SSL Parameters
Table C	RBCA Equations
Table D	RBCA Parameters
Table E	Default Physical and Chemical Parameters
Table F	Methods for Determining Physical Soil Parameters
Table G	Error Function (erf)
Table H	Q/C Values by Source Area
Table I	K _[oc] Values for Ionizing Organics as a Function of pH (cm(3)/g or L/kg)
Table J	Values to be Substituted for k _s When Evaluating Inorganics as a Function of pH (cm(3)[water]/g[soil])
Table K	Parameter Estimates for Calculating Water-Filled Soil Porosity (θ_w)

AUTHORITY: Implementing Sections 22.4, 22.12, Title XVI, and Title XVII and authorized by Sections 27, 57.14, and 58.5 of the Environmental Protection Act [415 ILCS 5/22.4, 22.12, 27, 57.14 and 58.5 and Title XVI and Title XVII].

SOURCE: Adopted in R97-12(A) at 21 Ill. Reg. 7942, effective July 1, 1997, amended in R97-12(B) at 21 Ill. Reg. 16391, effective December 8, 1997; amended in R97-12(C) at 22 Ill. Reg. _____, effective _____.

NOTE: Capitalization indicates statutory language.

SUBPART B: GENERAL

Section 742.210 Incorporations by Reference

- a) The Board incorporates the following material by reference:

ASTM. American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103 (215) 299-5400

ASTM D 2974-87, Standard Test Methods for Moisture, Ash and Organic Matter of Peat and Other Organic Soils, approved May 29, 1987 (reapproved 1995).

ASTM D 2488-93, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), approved September 15, 1993.

ASTM D 1556-90, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method, approved June 29, 1990.

ASTM D 2167-94, Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method, approved March 15, 1994.

ASTM D 2922-91, Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth), approved December 23, 1991.

ASTM D 2937-94, Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method, approved June 15, 1994.

ASTM D 854-92, Standard Test Method for Specific Gravity of Soils, approved November 15, 1992.

ASTM D 2216-92, Standard Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock, approved June 15, 1992.

ASTM D 4959-89, Standard Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating Method, approved June 30, 1989 (reapproved 1994).

ASTM D 4643-93, Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method, approved July 15, 1993.

ASTM D 5084-90, Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, approved June 29, 1990.

ASTM D 422-63, Standard Test Method for Particle-Size Analysis of Soils, approved November 21, 1963 (reapproved 1990).

ASTM D 1140-92, Standard Test Method for Amount of Material in Soils Finer than the No. 200 (75 µm) Sieve, approved November 15, 1992.

ASTM D 3017-88, Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth), approved May 27, 1988.

ASTM D 4525-90, Standard Test Method for Permeability of Rocks by Flowing Air, approved May 25, 1990.

ASTM D 2487-93, Standard Test Method for Classification of Soils for Engineering Purposes, approved September 15, 1993.

ASTM E 1527-93, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, approved March 15, 1993. Vol. 11.04.

ASTM E 1739-95, Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, approved September 10, 1995.

Barnes, Donald G. and Dourson, Michael. (1988). Reference Dose (RfD): Description and Use in Health Risk Assessments. Regulatory Toxicology and Pharmacology. 8, 471-486.

GPO. Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20401, (202) 783-3238.

USEPA Guidelines for Carcinogenic Risk Assessment, 51 Fed. Reg. 33992-34003 (September 24, 1986).

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," USEPA Publication number SW-846 (Third Edition, November 1986)Final Update III, December 1996, as amended by Updates I, ~~and~~ IIA, ~~and~~ III (Document No. 955-001-00000-1)(contact USEPA, Office of Solid Waste, for Update ~~IIA~~III).

"Methods for the Determination of Organic Compounds in Drinking Water", EPA Publication No. EPA/600/4-88/039 (December 1988 (Revised July 1991)).

"Methods for the Determination of Organic Compounds in Drinking Water, Supplement II", EPA Publication No. EPA/600/R-92/129 (August 1992).

"Methods for the Determination of Organic Compounds in Drinking Water, Supplement III", EPA Publication No. EPA/600/R-95/131 (August 1995).

IRIS. Integrated Risk Information System, National Center for Environmental Assessment, U.S. Environmental Protection Agency, 26 West Martin Luther King Drive, MS-190, Cincinnati, OH 45268. (513) 569-7254.

"Reference Dose (RfD): Description and Use in Health Risk Assessments", Background Document 1A (March 15, 1993).

"EPA Approach for Assessing the Risks Associated with Chronic Exposures to Carcinogens", Background Document 2 (January 17, 1992).

Nelson, D.W., and L.E. Sommers. 1982. Total carbon, organic carbon, and organic matter. In: A.L. Page (ed.), Methods of Soil Analysis. Part 2. Chemical and Microbiological Properties. 2nd Edition, pp. 539-579, American Society of Agronomy. Madison, WI.

NTIS. National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, (703) 487-4600.

"Dermal Exposure Assessment: Principles and Applications", EPA Publication No. EPA/600/8-91/011B (January 1992).

"Exposure Factors Handbook", EPA Publication No. EPA/600/8-89/043 (July 1989).

"Risk Assessment Guidance for Superfund, Vol. I; Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors", OSWER Directive 9285.6-03 (March 1991).

"Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites," EPA Publication No. EPA/600/8-85/002 (February 1985), PB 85-192219.

"Risk Assessment Guidance for Superfund, Volume I; Human Health Evaluation Manual (Part A)", Interim Final, EPA Publication No. EPA/540/1-89/002 (December 1989).

"Risk Assessment Guidance for Superfund, Volume I; Human Health Evaluation Manual, Supplemental Guidance, Dermal Risk Assessment Interim Guidance", Draft (August 18, 1992).

"Soil Screening Guidance: Technical Background Document", EPA Publication No. EPA/540/R-95/128, PB96-963502 (May 1996).

"Soil Screening Guidance: User's Guide", EPA Publication No. EPA/540/R-96/018, PB96-963505 (April 1996).

"Superfund Exposure Assessment Manual", EPA Publication No. EPA/540/1-88/001 (April 1988).

RCRA Facility Investigation Guidance, Interim Final, developed by USEPA (EPA 530/SW-89-031), 4 volumes (May 1989).

- b) CFR (Code of Federal Regulations). Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (202) 783-3238:

40 CFR 761.120 (1993).

- c) This Section incorporates no later editions or amendments.

SOURCE: Amended at 22 Ill. Reg. _____, effective, _____.

SUBPART C: EXPOSURE ROUTE EVALUATIONS

Section 742.310 Inhalation Exposure Route

The inhalation exposure route may be excluded from consideration if:

- a) The requirements of Sections 742.300 and 742.305 are met; and
- b) An institutional control, in accordance with Subpart J, is in place that meets the following requirements:
 - 1) Either:
 - A) The concentration of any contaminant of concern within ten feet of the land surface or within ten feet of any man-made pathway shall not exceed the Tier 1 remediation objective under Subpart E for the inhalation exposure route; or
 - B) An engineered barrier, as set forth in Subpart K and approved by the Agency, is in place; and
 - 2) Requires safety precautions for the construction worker if the Tier 1 construction worker remediation objectives are exceeded.

SOURCE: Amended at 22 Ill. Reg. _____, effective, _____.

SUBPART I: TIER 3 EVALUATION

Section 742.900 Tier 3 Evaluation Overview

- a) Tier 3 sets forth a flexible framework to develop remediation objectives outside of the requirements of Tiers 1 and 2. Although Tier 1 and Tier 2 evaluations are not prerequisites to conduct Tier 3 evaluations, data from Tier 1 and Tier 2 can assist in developing remediation objectives under a Tier 3 evaluation.
- b) The levels of detail required to adequately characterize a site depends on the particular use of Tier 3. Tier 3 can require additional investigative efforts beyond those described in Tier 2 to characterize the physical setting of the site. However, in situations where remedial efforts have simply reached a physical obstruction additional investigation may not be necessary for a Tier 3 submittal.
- c) Situations that can be considered for a Tier 3 evaluation include, but are not limited to:
 - 1) Modification of parameters not allowed under Tier 2;
 - 2) Use of models different from those used in Tier 2;
 - 3) Use of additional site data to improve or confirm predictions of exposed receptors to contaminants of concern;
 - 4) Analysis of site-specific risks using formal risk assessment, probabilistic data analysis, and sophisticated fate and transport models (e.g., requesting a target hazard quotient greater than 1 or a target cancer risk greater than 1 in 1,000,000);
 - 5) Requests for site-specific remediation objectives because an assessment indicates further remediation is not practical;
 - 6) Incomplete human exposure pathway(s) not excluded under Subpart C;
 - 7) Use of toxicological-specific information not available from the sources listed in Tier 2;
 - 8) Land uses which are substantially different from the assumed residential or industrial/commercial property uses of a site (e.g., as site will be used for recreation in the future and cannot be evaluated in Tiers 1 or 2); and

- 9) Requests for site-specific remediation objectives which exceed Tier 1 groundwater remediation objectives so long as the following is demonstrated:
- A) TO THE EXTENT PRACTICAL, THE EXCEEDENCE OF THE GROUNDWATER QUALITY STANDARD HAS BEEN MINIMIZED AND BENEFICIAL USE APPROPRIATE TO THE GROUNDWATER THAT WAS IMPACTED HAS BEEN RETURNED; AND
 - B) ANY THREAT TO HUMAN HEALTH OR THE ENVIRONMENT HAS BEEN MINIMIZED. (Section 58.5(D)(4)(A) of the Act)
- d) For requests of a target cancer risk ranging between 1 in 1,000,000 and 1 in 10,000 at the point of human exposure or a target hazard quotient greater than 1 at the point of human exposure, the requirements of Section 742.915 shall be followed. Requests for a target cancer risk exceeding 1 in 10,000 at the point of human exposure are not allowed.
- e) Requests for approval of a Tier 3 evaluation must be submitted to the Agency for review under the specific program under which remediation is performed. When reviewing a submittal under Tier 3, the Agency shall consider WHETHER THE INTERPRETATIONS AND CONCLUSIONS REACHED ARE SUPPORTED BY THE INFORMATION GATHERED. (Section 58.7(e)(1) of the Act). The Agency shall approve a Tier 3 evaluation if the person submits the information required under this Part and establishes through such information that public health is protected and that specified risks to human health and the environment have been minimized.

SOURCE: Amended at 22 Ill. Reg. _____, effective, _____.

Section 742.APPENDIX A: General

TABLE H: Chemicals Whose Tier 1 Class I Groundwater Remediation Objective Exceeds the 1 in 1,000,000 Cancer Risk Concentration.

Chemical	Class I Groundwater Remediation Objective (mg/l)	1 in 1,000,000 Cancer Risk Concentration (mg/l)	ADL (mg/l)
Aldrin	0.00004	0.0000025	0.00004
Benzo(a)pyrene	0.0002	0.0000512	0.00023
Bis(2-chloroethyl)ether	0.01	0.0000377	0.01
Bis(2-ethylhexyl)phthalate	0.006	0.00361	0.0027
Carbon Tetrachloride	0.005	0.000366	0.00003
Chlordane	0.002	0.0000366	0.00014
Dibenzo(a,h)anthracene	0.0003	0.00000512	0.0003
1,2-Dibromo-3-chloropropane	0.0002	0.0000361	0.0002
1,2-Dibromoethane	0.00005	0.000000410	0.00005
3,3'-Dichlorobenzidine	0.02	0.0000819	0.02
1,2-Dichloroethane	0.005	0.000494	0.00003
Dieldrin	0.00002	0.00000253	0.00002
Heptachlor	0.0004	0.00000819	0.00003
Heptachlor epoxide	0.0002	0.00000494	0.00032
Hexachlorobenzene	0.00006	0.0000253	0.00006
alpha-HCH	0.00003	0.00000614	0.00003
Tetrachloroethylene	0.005	0.000716	0.00001
Toxaphene	0.003	0.0000377	0.00086
Vinyl chloride	0.002	0.00001545	0.00006
Ionizable Organics			
N-Nitrosodiphenylamine	0.01	0.00717	0.01
N-Nitrosodi-n-propylamine	0.01	0.00000512	0.01
Pentachlorophenol	0.001	0.000371	0.001
2,4,6-Trichlorophenol	0.0064	0.00377	0.0064
Inorganics			
Arsenic	0.05	0.0000257	0.001
Beryllium	0.004	0.00000832	0.004

SOURCE: Amended at 22 Ill. Reg. _____, effective _____.

Section 742.APPENDIX B: Tier 1 Tables and Illustrations

Section 742.Table C: pH Specific Soil Remediation Objectives for Inorganics and Ionizing Organics for the Soil Component of the Groundwater Ingestion Route (Class I Groundwater)

Chemical (totals) (mg/kg)	pH 4.5 to 4.74	pH 4.75 to 5.24	pH 5.25 to 5.74	pH 5.75 to 6.24	pH 6.25 to 6.64	pH 6.65 to 6.89	pH 6.9 to 7.24	pH 7.25 to 7.74	pH 7.75 to 8.0
Inorganics									
Antimony	5	5	5	5	5	5	5	5	5
Arsenic	25	26	27	28	29	29	29	30	31
Barium	260	490	850	1,200	1,500	1,600	1,700	1,800	2,100
Beryllium	1.1	2.1	3.4	6.6	22	63	140	1,000	8,000
Cadmium	1.0	1.7	2.7	3.7	5.2	7.5	11	59	430
Chromium (+6)	70	62	54	46	40	38	36	32	28
Copper	330	580	2,100	11,000	59,000	130,000	200,000	330,000	330,000
Cyanide	40	40	40	40	40	40	40	40	40
Mercury	0.01	0.01`	0.03	0.15	0.89	2.1	3.3	6.4	8.0
Nickel	20	36	56	76	100	130	180	700	3,800
Selenium	24	17	12	8.8	6.3	5.2	4.5	3.3	2.4
Silver	0.24	0.33	0.62	1.5	4.4	8.5	13	39	110

Chemical (totals) (mg/kg)	pH 4.5 to 4.74	pH 4.75 to 5.24	pH 5.25 to 5.74	pH 5.75 to 6.24	pH 6.25 to 6.64	pH 6.65 to 6.89	pH 6.9 to 7.24	pH 7.25 to 7.74	pH 7.75 to 8.0
Thallium	1.6	1.8	2.0	2.4	2.6	2.8	3.0	3.4	3.8
Vanadium	980	980	980	980	980	980	980	980	980
Zinc	1,000	1,800	2,600	3,600	5,100	6,200	7,500	16,000	53,000
Organics									
Benzoic Acid	440	420	410	400	400	400	400	400	400
2-Chlorophenol	4.0	4.0	4.0	4.0	3.9	3.9	3.9	3.6	3.1
2,4-Dichlorophenol	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.86	0.69
Dinoseb	8.4	4.5	1.9	0.82	0.43	0.34	0.31	0.27	0.25
Pentachlorophenol	0.54	0.32	0.15	0.07	0.04	0.03	0.02	0.02	0.02
2,4,5-TP (Silvex)	26	16	12	11	11	11	11	11	11
2,4,5-Trichlorophenol	400	390	390	370	320	270	230	130	64
2,4,6-Trichlorophenol	0.37	0.36	0.34	0.269	0.20	0.15	0.13	0.09	0.07

SOURCE: Amended at 22 Ill. Reg. _____, effective _____.

Section 742.APPENDIX B Tier I Tables and Illustrations

Section 742.Table D: pH Specific Soil Remediation Objectives for Inorganics and Ionizing Organics for the Soil Component of the Groundwater Ingestion Route (Class II Groundwater)

Chemical (totals) (mg/kg)	pH 4.5 to 4.74	pH 4.75 to 5.24	pH 5.25 to 5.74	pH 5.75 to 6.24	pH 6.25 to 6.64	pH 6.65 to 6.89	pH 6.9 to 7.24	pH 7.25 to 7.74	pH 7.75 to 8.0
Inorganics									
Antimony	20	20	20	20	20	20	20	20	20
Arsenic	100	100	100	110	110	120	120	120	120
Barium	260	490	850	1,200	1,500	1,600	1,700	1,800	2,100
Beryllium	140	260	420	820	2,800	7,900	17,000	130,000	1,000,000
Cadmium	10	17	27	37	52	75	110	590	4,300
Chromium (+6)	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Copper	330	580	2,100	11,000	59,000	130,000	200,000	330,000	330,000
Cyanide	120	120	120	120	120	120	120	120	120
Mercury	0.05	0.06	0.14	0.75	4.4	10	16	32	40
Nickel	400	730	1,100	1,500	2,000	2,600	3,500	14,000	76,000
Selenium	24	17	12	8.8	6.3	5.2	4.5	3.3	2.4
Thallium	16	18	20	24	26	28	30	34	38
Zinc	2,000	3,600	5,200	7,200	10,000	12,000	15,000	32,000	110,000

Chemical (totals) (mg/kg)	pH 4.5 to 4.74	pH 4.75 to 5.24	pH 5.25 to 5.74	pH 5.75 to 6.24	pH 6.25 to 6.64	pH 6.65 to 6.89	pH 6.9 to 7.24	pH 7.25 to 7.74	pH 7.75 to 8.0
Organics									
Benzoic Acid	440	420	410	400	400	400	400	400	400
2-Chlorophenol	20	20	20	20	20	20	19	3.6	3.1
2,4-Dichlorophenol	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.86	0.69
Dinoseb	84	45	19	8.2	4.3	3.4	3.1	2.7	2.5
Pentachlorophenol	2.7	1.6	0.75	0.33	0.18	0.15	0.12	0.11	0.10
2,4,5-TP (Silvex)	130	79	62	57	55	55	55	55	55
2,4,5-Trichlorophenol	2,000	2,000	1,900	1,800	1,600	1,400	1,200	640	64
2,4,6-Trichlorophenol	0.37 <u>1.9</u>	0.36 <u>1.8</u>	0.34 <u>1.7</u>	0.26 <u>1.4</u>	0.20 <u>1.0</u>	0.15 <u>0.77</u>	0.13	0.09	0.07

SOURCE: Amended at 22 Ill. Reg. _____, effective, _____.

Section 742.APPENDIX C: Tier 2 Tables and Illustrations

Section 742.TABLE I: K_{oc} Values for Ionizing Organics as a Function of pH (cm³/g or L/kg)

pH	Benzoic Acid	2-Chloro-phenol	2,4-Dichloro-phenol	Pentachloro-phenol	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	Dinoseb	2,3,5-TP (Silvex)
4.5	1.07E+01	3.98E+02	1.59E+02	1.34E+04	2.37E+03	1.06E+03	3.00E+03 4	1.28E+04
4.6	9.16E+00	3.98E+02	1.59E+02	1.24E+04	2.37E+03	1.05E+03	2.71E+03 4	1.13E+04
4.7	7.79E+00	3.98E+02	1.59E+02	1.13E+04	2.37E+03	1.05E+03	2.41E+03 4	1.01E+04
4.8	6.58E+00	3.98E+02	1.59E+02	1.02E+04	2.37E+03	1.05E+03	2.12E+03 4	9.16E+03
4.9	5.54E+00	3.98E+02	1.59E+02	9.05E+03	2.37E+03	1.04E+03	1.85E+04	8.40E+03
5.0	4.64E+00	3.98E+02	1.59E+02	7.96E+03	2.36E+03	1.03E+03	1.59E+04	7.76E+03
5.1	3.88E+00	3.98E+02	1.59E+02	6.93E+03	2.36E+03	1.02E+03	1.36E+04	7.30E+03
5.2	3.25E+00	3.98E+02	1.59E+02	5.97E+03	2.35E+03	1.01E+03	1.15E+04	6.91E+03
5.3	2.72E+00	3.98E+02	1.59E+02	5.10E+03	2.34E+03	9.99E+02	9.66E+03	6.60E+03
5.4	2.29E+00	3.98E+02	1.58E+02	4.32E+03	2.33E+03	9.82E+02	8.10E+03	6.36E+03
5.5	1.94E+00	3.97E+02	1.58E+02	3.65E+03	2.32E+03	9.62E+02	6.77E+03	6.16E+03
5.6	1.65E+00	3.97E+02	1.58E+02	3.07E+03	2.31E+03	9.38E+02	5.65E+03	6.00E+03
5.7	1.42E+00	3.97E+02	1.58E+02	2.58E+03	2.29E+03	9.10E+02	4.73E+03	5.88E+03
5.8	1.24E+00	3.97E+02	1.58E+02	2.18E+03	2.27E+03	8.77E+02	3.97E+03	5.78E+03
5.9	1.09E+00	3.97E+02	1.57E+02	1.84E+03	2.24E+03	8.39E+02	3.35E+03	5.70E+03

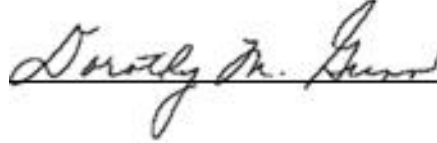
pH	Benzoic Acid	2-Chloro-phenol	2,4-Dichloro-phenol	Pentachloro-phenol	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	Dinoseb	2,3,5-TP (Silvex)
6.0	9.69E-01	3.96E+02	1.57E+02	1.56E+03	2.21E+03	7.96E+02	2.84E+03	5.64E+03
6.1	8.75E-01	3.96E+02	1.57E+02	1.33E+03	2.17E+03	7.48E+02	2.43E+03	5.59E+03
6.2	7.99E-01	3.96E+02	1.56E+02	1.15E+03	2.12E+03	6.97E+02	2.10E+03	5.55E+03
6.3	7.36E-01	3.95E+02	1.55E+02	9.98E+02	2.06E+03	6.44E+02	1.83E+03	5.52E+03
6.4	6.89E-01	3.94E+02	1.54E+02	8.77E+02	1.99E+03	5.89E+02	1.62E+03	5.50E+03
6.5	6.51E-01	3.93E+02	1.53E+02	7.81E+02	1.91E+03	5.33E+02	1.45E+03	5.48E+03
6.6	6.20E-01	3.92E+02	1.52E+02	7.03E+02	1.82E+03	4.80E+02	1.32E+03	5.46E+03
6.7	5.95E-01	3.90E+02	1.50E+02	6.40E+02	1.71E+03	4.29E+02	1.21E+03	5.45E+03
6.8	5.76E-01	3.88E+02	1.47E+02	5.92E+02	1.60E+03	3.81E+02	1.12E+03	5.44E+03
6.9	5.60E-01	3.86E+02	1.45E+02	5.52E+02	1.47E+03	3.38E+02	1.05E+03	5.43E+03
7.0	5.47E-01	3.83E+02	1.41E+02	5.21E+02	1.34E+03	3.00E+02	9.96E+02	5.43E+03
7.1	5.38E-01	3.79E+02	1.38E+02	4.96E+02	1.21E+03	2.67E+02	9.52E+02	5.42E+03
7.2	5.32E-01	3.75E+02	1.33E+02	4.76E+02	1.07E+03	2.39E+02	9.18E+02	5.42E+03
7.3	5.25E-01	3.69E+02	1.28E+02	4.61E+02	9.43E+02	2.15E+02	8.90E+02	5.42E+03
7.4	5.19E-01	3.62E+02	1.21E+02	4.47E+02	8.19E+02	1.95E+02	8.68E+02	5.41E+03
7.5	5.16E-01	3.54E+02	1.14E+02	4.37E+02	7.03E+02	1.78E+02	8.50E+02	5.41E+03
7.6	5.13E-01	3.44E+02	1.07E+02	4.29E+02	5.99E+02	1.64E+02	8.36E+02	5.41E+03

pH	Benzoic Acid	2-Chloro-phenol	2,4-Dichloro-phenol	Pentachloro-phenol	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	Dinoseb	2,3,5-TP (Silvex)
7.7	5.09E-01	3.33E+02	9.84E+01	4.23E+02	5.07E+02	1.53E+02	8.25E+02	5.41E+03
7.8	5.06E-01	3.19E+02	8.97E+01	4.18E+02	4.26E+02	1.44E+02	8.17E+02	5.41E+03
7.9	5.06E-01	3.04E+02	8.07E+01	4.14E+02	3.57E+02	1.37E+02	8.10E+02	5.41E+03
8.0	5.06E-01	2.86E+02	7.17E+01	4.10E+02	2.98E+02	1.31E+02	8.04E+02	5.41E+03

SOURCE: Amended at 22 Ill. Reg. _____, effective _____.

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 16th day of April 1998, by a vote of 7-0.

A handwritten signature in cursive script, reading "Dorothy M. Gunn", is written over a horizontal line.

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board