ILLINOIS POLLUTION CONTROL BOARD
April 26, 1990

IN THE MATTER OF:	)	
	)	
TOXIC AIR CONTAMINANTS LIST	)	R90-1
(35 ILL. ADM. CODE PART 232)	)	(Rulemaking)

PROPOSED RULE. FIRST NOTICE.

OPINION AND ORDER OF THE BOARD (by J. Marlin):

On April 17, 1990, the Board received the Illinois Environmental Protection Agency's ("Agency") Amended Proposal of Regulations, Amended Statement of Reasons, Addendum to Exhibit 6 and Amended Exhibits 7-9. Today the Board proceeds to First Notice with the Agency's amended Air Toxics proposal and accepts it for hearing.

On January 11, 1990 the Board docketed the Agency's original proposal but directed its Hearing Officer, in consultation with the Scientific and Technical Section, to prepare a document specifying the deficiencies in the proposal. This document was transmitted to the Agncy and entered into the record. The Board requested that the Agency amend its proposal to comply with certain drafting requirements. The Agency has now returned its Amended Proposal with additional supporting materials as noted above.

In its January 11, 1990 Order the Board also requested that the Agency address the issue as to how Section 9.5(c), an exemption of rulemakings pursuant to that Section from the economic impact requirements of Section 27(b), should be construed in light of amendments to the economic impact requirements of Section 27(a) by P.A. 85-1048 (SB 1834). In its Amended Statement of Reasons the Agency states:

> "[n]either the language of Senate Bill 1834, nor its legislative history, states any intent to amend subsection 9.5(c). Further, neither the language of Senate Bill 1834, nor its legislative history, states that the exemptions from an EcIS stated in subsection 27(b) are intended to be exclusive."

The Board concurs with these remarks of the Agency. The Board notes that, as construed, Section 9.5(c) of the Act exempts this rulemaking from the economic impact statement requirements of Section 27(b).

The Board today acts to send this regulatory proposal to First Notice without ruling on the merits of the proposal. As noted previously, this proposal is required pursuant to Section 55.2 of the Act. The Board directs the Clerk of the Board to cause the publication of the proposal in the Illinois Register. This action

does not constitute the Board's adoption of a substantive position concerning the proposal.

Notwithstanding the above, the Board has made minor changes in the proposal in order to better reflect the perceived intent in drafting and to correct minor deficiencies. The first of these is to remove certain brackets around phrases where the bracketing was felt to be inappropriate Administrative Procedure Act form. Second, the references in Section 232. APPENDIX B have been modified to reflect that they refer to procedures for calculating dose and toxicity scores rather than chronic toxicity scores. Finally, Section 232.320(b) has been altered to complete an incomplete sentence. The Agency is invited to comment as to whether these changes are appropriate.

In addition to the foregoing, the Board directs the Hearing Officer to set a hearing date for this proposal; to establish deadlines for the pre-filing of testimony and exhibits for those who wish to introduce evidence at the merit hearings; and, to establish deadlines for the pre-filing of questions. Those who do not pre-file such materials will be able to present their evidence only if time permits at the end of the hearing process. The Board believes that such procedures will accelerate the rulemaking process and at the same time provide continued opportunity for public participation.

ORDER

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE B: AIR POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER f: TOXIC AIR CONTAMINANTS

PART 232
TOXIC AIR CONTAMINANTS

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Section 232.APPENDIX A: List of Toxic Air Contaminants
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AUTHORITY: Implementing Section 9.5 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1987, ch. 111 1/2, pars. 1009.5 and 1027).

SOURCE: Adopted at ____ Ill. Reg. _____.

SUBPART A: GENERAL PROVISIONS

Section 232.100 Introduction

This Part establishes a program to identify toxic air contaminants in Illinois. It includes a list of toxic air contaminants, the procedures to determine a toxic air contaminant, the procedures to amend the list, and identification requirements for new emission sources.

Section 232.110 Incorporation by Reference

a) The following materials are incorporated by reference:

American Conference of Governmental Industrial Hygienists (ACGIH). Threshold Limit Values and Biological Exposure Indices for 1989-1990 (1989). Document can be obtained from: ACGIH, 6500 Glenway Avenue., Building D-7, Cincinnati, OH 45211-4438.

United States Department of Health and Human Services, Public Health Service, National Toxicological Program (NTP). Fifth Annual Report on Carcinogens (1989). Document can be obtained from: National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

World Health Organization, International Agency for Research on Cancer (IARC). Monographs on the Evaluation of Carcinogenic Risks to Humans, Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1 to 42, Supplement 7 (1987). Document can be obtained from: WHO Publications Centre USA, 49 Sheridan Avenue, Albany, N.Y. 12210.

b) This Section incorporates no future editions or amendments.

Section 232.120 Definitions

The definitions of 35 Ill. Adm. Code 201.102, 211.122 and 215.104 apply to this Part, as well as the definitions contained in this Section. Where a definition contained in this Section is more specific than those found in 35 Ill. Adm. Code 201.102, 211.122 and 215.104, it must take precedence in application of this Part.

"Adverse Health Effect" means a health injury or disease that may be produced by exposure to a contaminant. This includes any decrement in the function of an organ or organ system or any subclinical organ lesion that is likely to lead to a decrement in an organ or organ system function.

"Emits" or "Emission" or "Emitted" means any non-accidental release into the atmosphere from an emission source or air pollution control equipment, or fugitive emissions defined according to 35 Ill. Adm. Code 203.124.

"LC50" means the concentration in air of a contaminant that kills, or is estimated to kill, 50 percent of a population of laboratory animals where the exposure is brief (8 hours or less) and where the route of exposure is inhalation.

"LD50" means the dose of a contaminant that kills, or is estimated to kill, 50 percent of a population of laboratory animals where the route of exposure is ingestion.

"Lowest Observed Adverse Effect Level" means the lowest experimentally determined dose at which a statistically or biologically significant indication of the toxic effect of concern is observed.

"New Emission Source" means an emission source or air pollution control equipment for which a construction permit is required by 35 Ill. Adm. Code 201 after the effective date of these rules; or an emission source or air pollution control equipment for which an operating permit is required by 35 Ill. Adm. Code 201, where the owner or operator failed to apply for a construction permit and applies for the first operating permit.

"No Observed Effect" means the condition where no adverse health effect has been detected.

"Potential Toxic Air Contaminant" means a contaminant which meets the characteristics identified in subsections 232.200(b) or (c).

"Toxic Air Contaminant" means a contaminant which meets the characteristics identified in Section 232.200(a) and (b) or (c), or is listed in Appendix A.

SUBPART B: DETERMINATION OF A TOXIC AIR CONTAMINANT

Section 232.200 Characteristics for Determining a Toxic Air Contaminant

The following characteristics determine whether a contaminant is a toxic air contaminant:

a) a contaminant which is or has been emitted into the atmosphere in Illinois or is reported to be emitted into the atmosphere in Illinois after the effective date of these rules pursuant to Subpart D or to 35 Ill. Adm. Code 201, and

b) a contaminant which has a Toxicity Score of 3 or greater using the procedures for determining the Toxicity Score described in Section 232.310, or

c) a contaminant which is classified as a carcinogen according to Section 232.320.

Section 232.210 Listing of a Toxic Air Contaminant

The Agency will propose to the Board for listing any contaminant which has been determined by the Agency to meet the characteristics identified in Section 232.200. The contaminants found by the Board to be toxic air contaminants are listed in Appendix A.

SUBPART C: PROCEDURES FOR EVALUATING CHARACTERISTICS OF A TOXIC AIR CONTAMINANT

Section 232.300 Purpose

This Subpart identifies the procedures used to evaluate the characteristics of a toxic air contaminant. The Agency will use these procedures in proposing to list toxic air contaminants in Appendix A. The scores resulting from the use of these procedures will not be used to determine any particular control strategy.

Section 232.310 Procedure for Determining the Toxicity Score

The Toxicity Score is the sum of the Acute Lethality Score and the Chronic Toxicity Score. The Acute Lethality Score is a number which indicates a contaminant's potential to cause death. The Chronic Toxicity Score is a number which indicates a contaminant's potential to cause adverse health effects after chronic exposure.

a) Procedure for Determining the Acute Lethality Score

1) The Acute Lethality Score is derived from toxicological studies using laboratory rats. One of two routes of exposure is used: inhalation or ingestion. Values derived from inhalation are used in preference to values derived from ingestion.

2) The Acute Lethality Score is derived from the following table:

Inhalation Concentration (LC50)	Acute Lethality Score
Less than: 500 mg/cu. m	3
500-4999 mg/cu. m	2
5000-50000 mg/cu. m	1
Greater than: 50000 mg/cu. m	0

or, if the above data are not available:

Ingestion Dose (LD50)	Acute Lethality Score

Less than: 50 mg/kg	3
50-499 mg/kg	2
500-5000 mg/kg	1
Greater than: 5000 mg/kg	0

b) Procedure for Determining the Chronic Toxicity Score

The Chronic Toxicity Score is the product of the Lowest Toxic Dose Score and the Severity of Effects Score.

1) Procedure for Determining the Lowest Toxic Dose Score

A) The Lowest Toxic Dose Score is a number based upon the lowest dose of a contaminant that causes an observable adverse health effect. The Lowest Toxic Dose Score is derived from the following table:

Dose	Lowest Toxic Dose Score
Less than: 5 mg/kg/day	1
5-50 mg/kg/day	2/3
Greater than: 50 mg/kg/day	1/3

B) Procedures for calculating the lowest dose which causes any adverse health effect or the Lowest Toxic Dose Score are described in Appendix B.

2) Procedure for Determining the Severity of Effects Score

The Severity of Effects Score is a number based upon the organ(s) affected and the level of effect upon the organ(s).

A) Organ Categories

There are three categories of organs or organ systems which are identified as follows:

Category	Description
i) Category I	Category I includes: organs, the impairment or loss of which is fatal or usually cannot be compensated for by the

		body; gonads, the loss of which prevents the transmission of genetic material; and, adverse reproductive outcome including stillbirth, miscarriage, or reduced litter size (animal studies). The Category I organs are: Lungs, Heart, Brain, Spinal Cord, Kidneys, Liver, Bone Marrow, and Gonads.
ii)	Category II	Category II includes: organs, the impairment or loss of which may be fatal, but which can be compensated for by drug or replacement therapy; adverse effect on an immune function which may be life threatening; changes in the composition or function of blood constituents which may be life threatening; and, certain fetotoxic effects including premature birth, reduced birth weight, and reduced morphometric parameters. The Category II organs are: Adrenals, Thyroids, Parathyroids, Pituitary, Pancreas, Esophagus, Stomach, Small Intestine, Large Intestine, Lymph Nodes, Thymus, Trachea, Pharynx.
iii)	Category III	Category III includes: organs, the impairment or loss of which is not life threatening but may result in functional or emotional handicaps; and, changes in the composition or function of blood which are not life threatening but may

result in functional handicaps. Category III organs include, but are not limited to: Oviducts, Epididymides, Uterus, Prostrate, Seminal Vesicles, Ductus Deferens, Penis, Vagina, Eyes, Bone, Nose, Peripheral Nerves, Muscles, Urinary Bladder, Blood Vessels, Ears, Gallbladder, Larynx, Mammary Glands, Salivary Glands, Skin, Spleen, Tongue, Teeth, Ureter, Urethra.

B) Levels of Effect

There are four levels of effect: Serious Irreversible ("SI"); Serious Reversible ("SR"); Non-serious Irreversible ("NI"); and Non-serious Reversible ("NR").

i) A serious effect is an incapacitating condition or a condition which significantly contributes to an increase in mortality.

ii) A non-serious effect is a non-incapacitating condition or a condition which is unlikely to contribute to an increase in mortality.

iii) An irreversible effect is one that is permanent or would require medical treatment to correct.

iv) A reversible effect is a temporary effect.

C) Table of Severity of Effects Scores

The following table presents the Severity of Effects Scores for any level of effect observed in an organ belonging to a specified organ category.

Level of Effect	Organ Category		
	I	II	III

SI	6	5	4
SR	5	4	3
NI	4	3	2
NR	3	2	1
No Observed Effect	0	0	0

D) When a study identifies an adverse health effect on multiple organs within the same category at the lowest observed adverse effect level, the Severity of Effects Score is increased by a value of 1. In no event can the Severity of Effects Score be greater than 6.

Section 232.320 Carcinogen Classification

For purposes of this Part, the Agency will consider a contaminant to be a carcinogen if it is classified in the manner described in the following table by one or more of the carcinogen references.

a)

Reference	Classification
ACGIH	Category A1 Carcinogen or Category A2 Carcinogen
IARC	Category 1 Carcinogen or Category 2A/2B Carcinogen
IRIS	Category A Carcinogen or Category B1/B2 Carcinogen
NTP	Human Carcinogen or Anticipated Human Carcinogen

b) The references ACGIH, IARC, and NTP are incorporated by reference in Section 232.110. Categories A, B1, and B2 are carcinogens classified by the United States Environmental Protection Agency, Office of Health and Environmental Assessment, Integrated Risk Information System (IRIS), as of December 31, 1989, and are listed in Appendix C.

SUBPART D: IDENTIFICATION REQUIREMENTS FOR NEW EMISSION SOURCES

Section 232.400 Purpose

This Subpart establishes potential toxic air contaminant and toxic air contaminant identification requirements for new emission sources, and describes procedures to determine and list the potential toxic air contaminants that new emission sources must identify.

Section 232.410 Exceptions to Identification Requirements for New Emission Sources

The requirements of this Subpart do not apply to the following:

a) retail dry cleaning operations;

b) retail and noncommercial storage and handling of motor fuels;

c) combustion processes using only commercial fuel (which does not include hazardous waste), including internal combustion engines; and

d) any emission source or air pollution control equipment for which a permit is not required by 35 Ill. Adm. Code 201.

Section 232.420 Identification Requirements

a) An owner or operator of a new emission source shall identify with each permit application for that emission source, by name and Chemical Abstract Service Number where applicable, each contaminant identified in subsection (b) which is or will be emitted by the new emission source.

b) The identification requirements apply to:

1) toxic air contaminants listed in Appendix A, and

2) potential toxic air contaminants listed in the Agency document entitled "Potential Toxic Air Contaminants for Identification Requirements."

Section 232.430 Agency Authority

The Agency will:

a) identify and score according to the procedures in Subpart C contaminants not listed as toxic air contaminants;

b) for those contaminants that meet the characteristics of subsections 232.200 (b) or (c), provide public notice and an opportunity to comment according to Section 232.440 on the basis for listing as a potential toxic air contaminant; and

c) publish annually the Agency document entitled "Potential Toxic Air Contaminants for Identification

Requirements," which will list those contaminants that meet the characteristics of subsections 232.200 (b) or (c).

Section 232.440 Public Participation

a) The Agency will fulfill the public participation requirements set forth below before listing or delisting a contaminant in the Agency document entitled "Potential Toxic Air Contaminants for Identification Requirements."

1) The Agency will maintain a Potential Toxic Air Contaminant Review Notice List. Any person who requests in writing to the Agency will be placed on the Potential Toxic Air Contaminant Review Notice List.

2) The Agency will notify persons on the Potential Toxic Air Contaminant Review Notice List of its intent to list a potential toxic air contaminant. This notice will contain, at a minimum, the following:

A) the potential toxic air contaminant name and Chemical Abstract Service Number where applicable;

B) the basis of listing (the Toxicity Score or carcinogen classifications);

C) the citations to any applicable studies or reports; and

D) the date, time, and place of at least one public workshop to be held in order to review the basis for listing as a potential toxic air contaminant and to obtain oral and written comments.

3) The notice of intent to list a potential toxic air contaminant will be mailed no later than 90 days prior to the date of the first workshop.

4) The Agency will prepare and distribute to all participants a responsiveness summary as to the basis for the Agency's decision.

b) The Agency will maintain a permanent file for each potential toxic air contaminant. In addition to documents obtained by the Agency, this file will also contain all written public comments and documents

provided by the public. A copy of this file will be provided to the Board when a proposal for listing or delisting a toxic air contaminant is submitted pursuant to Subpart E, or upon written request of any person.

Section 232.450 List of Potential Toxic Air Contaminants for Identification Requirements

a) The Agency will publish at least annually the Agency document entitled "Potential Toxic Air Contaminants for Identification Requirements." This document will be available to any person who requests a copy in writing and will be available to permit applicants.

b) After the public participation requirements of Section 232.440 are met, the Agency will add those contaminants that meet the characteristics of subsections 232.200 (b) or (c) to the Agency document entitled "Potential Toxic Air Contaminants for Identification Requirements."

SUBPART E: LISTING AND DELISTING

Section 232.500 Listing and Delisting of Toxic Air Contaminants

a) When the Agency has knowledge that a potential toxic air contaminant is emitted into the atmosphere in Illinois, the Agency will propose that contaminant to the Board as a toxic air contaminant. A copy of the permanent file for each potential toxic air contaminant will be submitted to the Board with the proposal.

b) Any person can propose to the Board to list or delist a toxic air contaminant. Written notification must be sent to the Agency 90 days prior to submitting a proposal to the Board.

c) The notification for listing a contaminant as a toxic air contaminant must include, at a minimum, the following:

1) the contaminant name and Chemical Abstract Service Number where applicable;

2) the basis of listing (Toxicity Score or carcinogen classifications);

3) a copy of each study or report justifying the basis of listing; and

4) the identification of the source emitting the

contaminant.

d) The notification for delisting a toxic air contaminant must include, at a minimum, the following:

1) the toxic air contaminant name and Chemical Abstract Service Number where applicable;

2) the basis for delisting; and

3) a copy of each study or report justifying the basis for delisting.

e) The Agency will propose an update of the list of toxic air contaminants to the Board no less frequently than once every 2 years.

Section 232.510 Listing and Delisting of Potential Toxic Air Contaminants

a) Any person can request the Agency to list or delist a potential toxic air contaminant identified in the Agency document entitled "Potential Toxic Air Contaminants for Identification Requirements." The request must include, at a minimum, the following:

1) the potential toxic air contaminant name and Chemical Abstract Service Number where applicable;

2) the basis for listing or delisting (Toxicity Score or carcinogen classifications); and

3) a copy of each study or report justifying the basis for selection.

b) The Agency will provide notice and an opportunity for public comment according to Section 232.440 for those requests received by the Agency pursuant to subsection (a) above.

c) The Agency will update the list of potential toxic air contaminants as necessary, but no less frequently than once every year.

Section 232.APPENDIX A: List of Toxic Air Contaminants

Chemical Name	Chemical Abstract Service Number
1) Acetaldehyde	000075-07-0
2) Acetonitrile	000075-05-8
3) Acrylamide	000079-06-1

4)	Acrylic acid	000079-10-7
5)	Acrylonitrile	000107-13-1
6)	Aniline	000062-53-3
7)	Arsenic	007440-38-2
8)	Asbestos (friable)	001332-21-4
9)	Benzene	000071-43-2
10)	Beryllium oxide	001304-56-9
11)	Biphenyl	000092-52-4
12)	Boron trifluoride	007637-07-2
13)	1,3-Butadiene	000106-99-0
14)	2-Butoxyethanol	000111-76-2
15)	Cadmium	007440-43-9
16)	Caprolactam	000105-60-2
17)	Carbon disulfide	000075-15-0
18)	Carbon tetrachloride	000056-23-5
19)	Chloramben	000133-90-4
20)	Chlordane	000057-74-9
21)	Chlorinated dibenzodioxins	
22)	Chlorinated dibenzofurans	
23)	Chloroacetic acid	000079-11-8
24)	Chloroform	000067-66-3
25)	Chromium	007440-47-3
26)	Coal tar (pitch) volatiles	065996-93-2
27)	Copper	007440-50-8
28)	p-Cresidine	000120-71-8
29)	4,4-Diaminodiphenyl ether	000101-80-4
30)	Dibutyl phthalate	000084-74-2
31)	p-Dichlorobenzene	000106-46-7
32)	2,4-Dichlorophenoxyacetic acid (2,4-D)	000094-75-7
33)	1,3-Dichloropropylene	000542-75-6
34)	Dimethyl sulfate	000077-78-1
35)	1,4-Dioxane	000123-91-1
36)	Di(2-ethylhexyl) phthalate	000117-81-7
37)	Epichlorohydrin	000106-89-8
38)	Ethyl acrylate	000140-88-5
39)	Ethylene dichloride	000107-06-2
40)	Ethylene oxide	000075-21-8
41)	Fluorine	007782-41-4
42)	Formaldehyde	000050-00-0
43)	Hexachlorocyclopentadiene	000077-47-4
44)	Hydrazine	000302-01-2
45)	Hydrogen cyanide	000074-90-8
46)	Lead	007439-92-1
47)	Mercury	007439-97-6
48)	4,4'-Methylenebis(N,N'-dimethyl) benzenamine	000101-61-1
49)	4,4'-Methylenedianiline	000101-77-9
50)	Methylene chloride	000075-09-2
51)	Methylenebis(phenylisocyanate)	000101-68-8
52)	Molybdenum trioxide	001313-27-5
53)	Nickel	007440-02-0
54)	Nitric acid	007697-37-2

55)	2-Nitropropane	000079-46-9
56)	Pentachloronitrobenzene	000082-68-8
57)	Peracetic acid	000079-21-0
58)	Phenol	000108-95-2
59)	Phorate	000298-02-2
60)	Phosphorus	007723-14-0
61)	Polychlorinated biphenyls (PCBs)	001336-36-3
62)	Propylene oxide	000075-56-9
63)	Quinoline	000091-22-5
64)	Selenium	007782-49-2
65)	Styrene	000100-42-5
66)	Sulfuric acid	007664-93-9
67)	Terbufos	013071-79-9
68)	Tetrachloroethylene	000127-18-4
69)	Toluene	000108-88-3
70)	Toluene-2,4-diisocyanate	000584-84-9
71)	Toluene-2,6-diisocyanate	000091-08-7
72)	Trichloroethylene	000079-01-6
73)	1,2,4-Trimethylbenzene	000095-63-6
74)	Trifluralin	001582-09-8
75)	2,4,6-Trinitrotoluene	000118-96-7
76)	Vinyl chloride	000075-01-4
77)	Vinylidene chloride	000075-35-4

78) Arsenic Compounds
Includes any unique chemical substance that contains arsenic as part of that chemical's infrastructure.

79) Cadmium Compounds
Includes any unique chemical substance that contains cadmium as part of that chemical's infrastructure.

80) Chromium Compounds
Includes any unique chemical substance that contains chromium as part of that chemical's infrastructure.

81) Cobalt Compounds
Includes any unique chemical substance that contains cobalt as part of that chemical's infrastructure

82) Cyanide Compounds
X (pos) CN (neg) where
X = H (pos) or any other group where a formal dissociation can be made.
For example, KCN or Ca(CN)2.

83) Lead Compounds
Includes any unique chemical substance that contains lead

as part of that chemical's infrastructure. For example, alkylated lead compounds.

84) Nickel Compounds
Includes any unique chemical substance that contains nickel as part of that chemical's infrastructure.

Section 232.APPENDIX B: Procedures for Calculating the Lowest Toxic Dose Score

a) Procedures to be used in selecting chronic toxicity studies.

1) Chronic toxicity studies in which all of the items in subsection (a)(1)(A) are identified or measured with adequate specificity to use the equations in subsection (b) must be given first preference:

A) Study items to be identified or measured:

i) test species;
ii) contaminant dose;
iii) duration of exposure must be at least 21 days, except for developmental studies in animals, in which case the duration of exposure must be at least 10 consecutive days during critical gestation days;
iv) route of exposure; and
v) effect of exposure.

B) In the event that two or more studies are available in which the above items are identified or measured, the study that results in the highest Chronic Toxicity Score must be used.

2) Studies that identify or measure all of the items in subsection (a)(1)(A) except for the contaminant dose, must be given second preference.

A) For a second preference study, the Lowest Toxic Dose Score for a given species and a given route of exposure must be determined according to the following table:

Species	Route of Exposure	Lowest Toxic Dose Score
Human	Inhalation	1

Human	Non-Inhalation	2/3
Non-Human	Inhalation	2/3
Non-Human	Non-Inhalation	1/3

B) In the event that two or more second preference studies are available, the study that results in the highest Chronic Toxicity Score must be used.

3) A contaminant for which there are insufficient data in the study to identify the elements of either a first or second preference study, must be determined to have no data and be assigned a Chronic Toxicity Score of 0.

b) The following general equation must be used to obtain the dose in units of milligram per kilogram per day for the oral, gavage and inhalation routes of exposure:
Dose = (I)(C)(TCF)/UF

1) For the routes of exposure listed below, use the following:

TCF = Time Correction Factor of 1, unless the exposure was intermittent, in which case the fraction of time during which exposure occurred is used (e.g., 5 days/week = 5/7 = 0.71).

UF = Uncertainty Factor of 10, used only when data are for exposure periods less than 90 days. In the case of fetotoxicity and teratogenicity studies, an Uncertainty Factor of 1 must be used.

2) Where the exposure is oral use the following:

A) Oral Exposure via Food:

I = Food Intake in kilogram of food ingested per kilogram of body weight per day (kg/kg-d) (refer to Chart 1 for standard values);

C = Contaminant Concentration in food in units of milligram per kilogram (mg/kg); or

B) Oral Exposure via Water:

I = Water Intake in liter of water ingested per kilogram of body weight per day

(L/kg-d) (refer to Chart 1 for standard values);

C = Contaminant Concentration in water in units of milligram per liter (mg/L); or

3) Where the exposure is via gavage use the following:

The product (I x C) in the above equation must be replaced by Gavage Dose (GD) in units of milligram of contaminant ingested per kilogram of body weight per day (mg/kg-d); or

4) Where the exposure is via inhalation use the following:

I = Air intake in cubic meter of air inhaled per kilogram of body weight per day (m^3/kg-d) measured as the product of Ventilation Rate (VR) (refer to Chart 1 for standard values) and Inhalation retention factor (RF) (assumed to be 0.5 for this procedure);

C = Contaminant Concentration in air in units of milligram per cubic meter (mg/m^3).

Chart 1 Summary of Physiological Parameters

Species	Water Intake L/(kg-d)	Food Intake kg/(kg-d)	Ventilation Rate m^3/(kg-d)
Mouse	0.25	0.150	1.44
Rat	0.10	0.050	0.66
Guinea Pig	0.075	0.040	0.58
Rabbit	0.065	0.030	0.46
Cat	0.100	0.050	0.46
Dog	0.025	0.025	0.31
Human	0.029	0.025	0.26
Monkey	0.14	0.07	0.32

Section 232.APPENDIX C: Categories A, B1, and B2 carcinogens of

the reference United States Environmental Protection Agency, Office of Health and Environmental Assessment, Integrated Risk Information System (IRIS), as of December 31, 1989

	Chemical Name	CAS Number	Category
1)	Acetaldehyde	000075-07-0	B2
2)	Acrylamide	000079-06-1	B2
3)	Acrylonitrile	000107-13-1	B1
4)	Aldrin	000309-00-2	B2
5)	Aniline	000062-53-3	B2
6)	Arsenic	007440-38-2	A
7)	Azobenzene	000103-33-3	B2
8)	Benzene	000071-43-2	A
9)	Benzidine	000092-87-5	A
10)	Benzo(a)pyrene	000050-32-8	B2
11)	Benzyl chloride	000100-44-7	B2
12)	Beryllium	007440-41-7	B2
13)	Bis(2-ethylhexyl) phthalate	000117-81-7	B2
14)	Bis(chloroethyl) ether	000111-44-4	B2
15)	Bis(chloromethyl) ether	000542-88-1	A
16)	1,3-Butadiene	000106-99-0	B2
17)	Cadmium	007440-43-9	B1
18)	Carbon Tetrachloride	000056-23-5	B2
19)	Chlordane	000057-74-9	B2
20)	Chloroform	000067-66-3	B2
21)	Chloromethyl Methyl Ether	000107-30-2	A
22)	Chromium(VI)	18540-29-9	A
23)	Coke Oven Emissions	008007-45-2	A
24)	Creosote	008001-58-9	B1
25)	DDD	000072-54-8	B2
26)	DDE	000072-55-9	B2
27)	DDT	000050-29-3	B2
28)	1,2-Dichloroethane	000107-06-2	B2
29)	1,3-Dichloropropene	000542-75-6	B2
30)	Dichlorovos	000062-73-7	B2
31)	Dieldrin	000060-57-1	B2
32)	Dimethyl Sulfate	000077-78-1	B2
33)	1,4-Dioxane	000123-91-1	B2
34)	1,2-Diphenylhydrazine	000122-66-7	B2
35)	Epichlorohydrin	000106-89-8	B2
36)	Ethylene Dibromide	000106-93-4	B2
37)	Folpet	000133-07-3	B2
38)	Formaldehyde	000050-00-0	B1
39)	Furmecyclox	060568-05-0	B2
40)	Heptachlor	000076-44-8	B2
41)	Heptachlor Epoxide	001024-57-3	B2
42)	Hexachlorocyclohexane, technical	000608-73-1	B2
43)	alpha-Hexachlorocyclohexane	000319-84-6	B2
44)	Hexachlorodibenzo-p-dioxin	019408-74-3	B2
45)	Hydrazine, Hydrazine Sulfate		B2

(mixture)

Chemical Name	CAS Number	Category
46) Lead and Compounds (Inorganic)		B2
47) 4,4'-MethyLenebis(N,N'-dimethyl) benzenamine	000101-61-1	B2
48) N-Nitroso-N -methylethylamine	010595-95-6	B2
49) N-Nitroso-di-n-butylamine	000924-16-3	B2
50) N-Nitrosodi-N-propylamine	000621-64-7	B2
51) N-Nitrosodiethanolamine	001116-54-7	B2
52) N-Nitrosodiethylamine	000055-18-5	B2
53) N-Nitrosodimethylamine	000062-75-9	B2
54) N-Nitrosodiphenylamine	000086-30-6	B2
55) N-Nitrosopyrrolidine	000930-55-2	B2
56) Nickel Carbonyl	013463-39-3	B2
57) Nickel Refinery Dust	007440-02-0	A
58) Nickel Subsulfide	012035-72-2	A
59) Polychlorinated Biphenyls	001336-36-3	B2
60) Toxaphene	008001-35-2	B2

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 26th day of December, 1990, by a vote of 7-0.

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board