ILLINOIS POLLUTION CONTROL BOARD
June 4, 1992

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

PROPOSED RULE SECOND NOTICE

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

This regulatory proposal to list toxic air contaminants in the State of Illinois is before the Board following a hearing held January 7, 1992, and the expiration of the post-hearing public comment period, extended to March 31, 1992 at the Illinois Environmental Protection Agency's (Agency) request. The hearing concerned the Board's second first notice proposal of regulations adopted September 26, 1991 and published in the Illinois Register on October 18, 1991. (15 Ill. Reg. 14969.) The Board's original first notice proposal was adopted on April 26, 1990 and published in the Illinois Register on June 8, 1990. (14 Ill. Reg. 8905.) The rulemaking is required by Section 9.5(d) of the Environmental Protection Act (Act) (Ill. Rev. Stat. 1991, ch. 111 1/2, par. 1001 et seq.)

Today, after reviewing the record, the hearing transcript and all public comments, the Board makes certain changes to the text of the rules as proposed at second first notice and submits them to the Joint Committee on Administrative Rules (JCAR) for second notice review.

PUBLIC PARTICIPATION

The Board received ten public comments (PC) following publication of the second first notice proposal. These are:

PC 42	Office of the Secretary of State, Administrative Code Division
PC 43	Illinois Department of Energy and Natural Resources (DENR)
PC 44	Illinois Fertilizers and Chemical Association (IFCA)
PC 45	Illinois Chapter of the Sierra Club (ICSC)
PC 46	Illinois Steel Group (ISG)
PC 47	Illinois Department of Commerce and Community Affairs
PC 48	Ford Motor Company
PC 49	Illinois Department of Energy and Natural Resources
PC 50	Dow Elanco
PC 51	Illinois Department of Energy and Natural Resources

The Board conducted a hearing on January 7, 1992, in the

Stratton Office Building, Rm. D-1, Springfield, Illinois. Presenting testimony at that hearing[1] were Mr. Henry Naour on behalf of the Illinois Environmental Protection Agency (Agency), Mr. Dan Grissom of the Chemical Industry Council of Illinois (CICI), and Ms. Mary Ross representing the Illinois Chapter of the Sierra Club, the Chicago Lung Association and the Coalition for Consumer Rights. Mr. Jeff Lang testified for the Styrene Information and Research Center (SIRC). Mr. William Buffaloe testified on behalf of Rhone-Poulenc.

Post-hearing public comments were filed by:

PC 52	Growmark
PC 53	Illinois Farm Bureau
PC 54	Styrene Information and Research Center
PC 55	Illinois Environmental Protection Agency
PC 56	Illinois Chapter of the Sierra Club
PC 57	Illinois Steel Group
PC 58	Chlorobenzene Producers Association (CPA)
PC 59	Illinois Fertilizer and Chemical Association
PC 60	Illinois Environmental Regulatory Group
PC 61	CF Industries
PC 62	Illinois Environmental Protection Agency
PC 63	Rhone-Poulenc

DISCUSSION

Three sections of the second first notice proposal received significant attention at hearing and in comments. These are 1) Section 232.200 "Characteristics for Determining a Toxic Air Contaminant"; 2) Section 232.320 "Carcinogen Classification" and 3) Section 232.500 "Procedures for Listing and Delisting Toxic Air Contaminants". In addition, the listing of two chemicals, styrene and ammonia, and the listing of agricultural pesticides and fertilizers, were the subject of testimony and questioning at hearing. The following discussion focuses on each in turn.

Section 232.200 "Characteristics for Determining a Toxic Air Contaminant"

In its Second First Notice Opinion and Order, the Board proposed to add the statutory definition of toxic air contaminant to Section 232.200 as a "narrative" standard. The Board commented

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[1] References to the record of the January 7, 1992 hearing are designated "3R. ___". References to the March 21, 1991 hearing are referred to as "2R. ___"; those of the June 25-26 and September 6-7, 1990 as "1R. ___".

as follows:

> This change will have the effect of providing a "general" or narrative description of what constitutes a toxic air contaminant, as is found in the enabling statute. It will complement the numerical scoring and classification protocols developed by the Agency. The Board believes that this change is most reflective of the legislature's intent and most protective of the public. A greater error, the Board believes, would be to fail to include a toxic air contaminant by a restrictive scoring mechanism. Therefore the Board has altered Section 232.200 to reflect this change. This change will also allow delisting of a compound that may be delisted upon a suitable demonstration before the Board that there are valid scientific reasons that they should not be listed despite meeting the criteria of 232.200 (a) or (b). (Second First Notice Opinion and Order, p. 13.)

The Agency testified at hearing that it opposes the narrative standard included in this section because it is "open-ended, unstructured, and allows the Board to list or delist chemicals regardless of their scores". (3R. 7.) The Agency believes the scoring mechanism it devised is "sound and replicable". (PC 55, p. 2.) However, the Agency did propose certain changes at hearing which would allow its selection procedure to be overridden. Under the Agency's proposal the petitioner would have to show that the selection criterion was flawed by its failure to consider "certain relevant evidence" and that this evidence shows that the contaminant meets, or fails to meet, the statutory definition of a toxic air contaminant (TAC). The Agency eventually offered three categories of evidence which it believed met the standard of "relevant evidence". (3R 75.) In its post-hearing comments, the Agency added two more. (PC 55, p. 4.)

The Sierra Club supported the Agency's concept, stating that the Board's proposed clause was "fundamentally flawed" and could result in a more under-inclusive list than the scoring procedure alone. The Sierra Club believed its proposal would make "exceedingly clear that once a substance is determined a toxic air contaminant under the Agency's criteria, it cannot be delisted based upon the presentation of differenc [sic] evidence which simply ignores the evidence used initially." (PC 56.)

The Illinois Steel Group also objected to the narrative standard as proposed at second first notice. It suggested language to ensure that toxic air contaminants can only be listed in a regulatory proceeding, after notice and opportunity for hearing. (PCs 46,57.) The ISG stated that it saw no substantial difference between the second first notice language and the

Agency's proposed amendments. (PC 57, p. 2.) The ISG also stated that it would object to limiting the potential evidence to be considered in determining whether the methodology was flawed with regard to a particular substance. (Id.) Section 232.200(d) has been added to this second notice proposal to make it clear that listing and delisting requires a regulatory proceeding.

Dan Grissom, for the CICI, testified that CICI also disagreed with the Board's language in the second first notice proposal. The CICI preferred the original first notice language because it only listed chemicals on the basis of toxicity as defined by the best available science and did not contain a narrative standard. (3R. 93.) The CICI proposed alternative language which would require a petition to show that the listing characteristics fail to consider scientific evidence or analysis, which considered with all other evidence, indicates that the contaminant meets, or fails to meet, the statutory definition. (3R. 95.)

It is apparent that the participants fear the flexibility inherent in the narrative standard. Some assume the standard will be applied too rigidly while others believe it will be broadly applied.

The Board accepts the Toxicity Score and Carcinogen Classification procedures as an efficient means of determining whether most compounds meet the statutory definition. The vast majority of chemicals will be listed in Appendix A on the basis of the Agency screening procedure, which identifies compounds which are reasonably expected to pose a threat to human health.

Indeed, today's Board action lists 264 compounds based on the Agency's recommendation and scoring procedure. It is unlikely that every chemical that fits the statutory definition will neatly fit the procedures. However, it is the substance of the statute contained in the legislature's definition, which controls what is and what is not put on the list as a "toxic air contaminant". The changes to Section 232.200(c) are based on this concept.

The Board notes that the Agency Toxicity Score and Carcinogen Classification procedures cannot displace the very broad statutory definition in Section 9.5(c) of the Act (Ill. Rev. Stat. 1991, ch. 111 1/2, par. 1009.5(c).) Any person would be free to file a rulemaking proposal based on the statute seeking to have a chemical added to the list. If the Board finds that the evidence presented in the proceeding demonstrates that the chemical meets the statutory definition, the Board may add such chemical to the list, regardless of whether it met the Agency supported criteria. The addition of the statutory definition as part of the process to evaluate compounds for listing allows any person to bring to the attention of the Board

additional evidence which may justify the addition or removal of a toxic air contaminant. The rulemaking process grants each participant the opportunity to support or oppose the petition. We believe that no less is required by the express language of the statute.

The Agency is commended for developing the procedures, which will remain the primary basis for most listing and delisting regulatory proceedings. Likewise, the commenters made many useful observations. The changes and clarifications reflected in Sections 232.200 and 232.500 (see discussion below) and are a result of these comments.

The Board agrees with the comments of the Illinois Steel Group that modifications to the list should occur only in a regulatory proceeding with notice and opportunity for hearing. (PCs 46, 57.) The proposal has been modified accordingly.

Finally, all groups agreed that language in the section relating to environmental effects should be removed at this time. The Agency's environmental effects proposal is to be considered in Docket B of this proceeding. Until that proposal is submitted, the participants agreed that consideration of environmental effects in the listing or delisting decision was premature. (PCs 56, 60, 62.) In response to these concerns, the Board has removed the phrase "and environmental effects" from the statutory citation in Section 232.200(b). We anticipate that upon consideration of the Agency's promised environmental effects proposal this phrase will be restored. This temporary deletion from the rule does not contravene the statute.

Section 232.320(b) Carcinogen Classification

At second first notice, the Board addressed a highly contested issue regarding the carcinogen classification scheme initially proposed by the Agency: whether USEPA final rules should be used as an additional basis for exemptions under Section 232.200(b) from carcinogen classification along with accepted International Agency for Research on Cancer (IARC), USEPA's Integrated Risk Information System (IRIS), National Toxicology Program (NTP) and American Conference of Governmental Industrial Hygienists (ACGIH) carcinogen listings ("the four carcinogen listings"). Essentially, the first notice proposal provided that any chemical meeting a certain classification on one of the four carcinogen listings would be considered a toxic air contaminant. Based largely on comments by the CPA, the Board proposed at second first notice to exclude those chemicals from the toxic air contaminant list any carcinogen for which USEPA had adopted a final rule classifying the chemical as a category "C" carcinogen. After much testimony regarding the difficulties of implementation, the Board has decided to remove the exemption from Section 232.320.

The crux of the continuing debate lies in considering whether the exemption should be "applicable to air contaminants" as proposed by the Agency (PC 55) or only apply to those substances which can be shown to not cause exposures via inhalation route by reviewing the underlying studies. The Agency states that it opposes the use of underlying data to determine the applicability of inhalation exposure as such a review "would require the Agency to develop criteria in this proposal to evaluate the applicability of the data to inhalation exposure. This would create a great burden on the Agency and the Board". (PC 55, pp. 6-7.) The Board's second first notice language had removed all references to inhalation exposure or air contaminants from the carcinogen exemption.

The Agency further argues that the carcinogen exemption should be applied in a "conservative manner" as it is in the "public interest" to do so. The Agency opines that the Board overlooked the fact that these exemptions are from two internationally recognized carcinogen classification sources. (PC 55, p. 7.)

The CPA initially proposed that EPA classifications be considered if they could be shown to be applicable to inhalation exposure. It repudiated this position in its post-hearing public comment (PC 58) stating that the Agency's position on this issue was a continually shifting target and urged adoption of the Board's "clear, simple" language.

The Styrene Information and Research Center's voluminous comments (PC 54) and testimony on this point contended that IEPA erred in its comparison of International Agency for Research on Cancer and USEPA's Integrated Risk Information System cancer classifications. The SIRC did not directly address the issue of the exemption expansion.

Limited testimony exists in this record regarding USEPA's practice of identifying in a final rule whether a carcinogen classification is applicable to inhalation exposure or specific to an air contaminant. Thus, the Board must assume that a detailed review of the final rule and, perhaps, the underlying studies, will be necessary to determine the nature of the classification. The Agency has indicated their hesitance to be burdened with this level of review. (PC 55, p. 7.)

Based on the continuing controversy on this issue and the apparent complexity of the alternate proposals, the Board has decided to strike Section 232.320(b) of the second first notice proposal of regulations, thereby eliminating the exemption. The opportunity to present evidence to the Board to list or delist a compound is available to any person pursuant to Section 232.500 "Procedures for Listing and Delisting Toxic Air Contaminants". (see discussion below). Thus, any party concerned with the use

of the carcinogen classification method may avail themselves of this opportunity and will be provided the notice and comment of formal Board proceedings.

In addition, the Board wishes to affirm its second first notice decision to delist para-dichlorobenzene (PDCB). This is based on the extensive testimony and evidence provided by CPA which persuasively demonstrated that PDCB is not considered to be a probable human carcinogen by USEPA and that USEPA has given the evidence regarding PDCB's human carcinogenicity a more thorough review than IARC. The Board has determined that the evidence presented by CPA meets the requirements for delisting pursuant to Section 232.500(b)(2). The Board notes that neither the Agency nor any other participant lodged objections to the removal of PDCB from Appendix A in the second first notice proposal.

Section 232.500 "Procedures for Listing and Delisting Toxic Air Contaminants"

In response to comments about the clarity and intent of the listing and delisting process, Section 232.500(b) has been modified. It now specifically articulates that the listing/delisting process is a regulatory process, and includes specific requirements for the content of a listing or delisting proposal. The listing/delisting proponent must include a showing that, at a minimum, one of five conditions exist. The first is that the Toxicity Score or Carcinogen Classification was correctly determined as required by Subpart C. This will generally apply to listing petitions. The other conditions include demonstrating that the scoring or classification procedure is not appropriate for a given contaminant, that the procedure is applied incorrectly, or that the studies used initially were inadequate for the purposes of scoring or carcinogenicity listing. A proponent may also bring to the Board's attention additional or new studies which they feel should be considered in any deliberations regarding listing or delisting of a compound. These conditions are not exclusive, and a proponent is encouraged to supplement the record with all available relevant evidence. The Board feels that these additions will narrow the scope of the listing or delisting requests and provide the evidence needed to make a decision. They also address many of the concerns raised regarding the narrative standard concept.

The Board proposed at second first notice that all contaminants in proposals to list or delist be scored by the Agency. This score would then be presented to the Board in the form of an Agency recommendation or co-petition or response, (See Sections 232.500(c) and (d)). The Agency has asked the Board to remove these two sections stating that the Board lacks the authority to direct the Agency to perform these functions.

The Agency cited R90-20, Diesel Vehicle Exhaust Opacity Limits (December 19, 1991) in support.

In the Board's opinion concerning diesel exhaust opacity limitations, the Board decided that it lacked the authority to direct local law enforcement officials as to proper procedures when confronted with a violation of diesel exhaust opacity standards. We do not see, however, how the Agency believes that the Board's admission that local law enforcement concerns were outside Board authority also means that the Board lacks the authority to set procedures designed to assist in the evaluation of toxic air contaminants. Moreover, Section 9.5(c) of the Act in particular requires direct participation in developing a list which meets the requirements of this subsection. We believe a Board procedure for Agency involvement in the scoring process is appropriate.

The ICSC has also expressed a desire to have the Agency participate in scoring citizen proposals to ensure consistency. (PC 45, p. 2.) We note that the Agency stated that it intends to participate in citizen proposals. The Agency's participation, however, sometimes does not fully materialize because of time and resource restraints. A recent example would be the Agency's failure to address substantive issues in a timely manner in the Keystone hazardous waste delisting proceeding. Even after being granted 100 days of extension beyond the 30 days to file its response, the Agency informed the Board that it would not evaluate a major portion of the petition "due to informational deficiencies" and, if asked by the Board, would conduct a review but would need an additional 45 days. (AS 91-1, ___ PCB ___ (February 6, 1992).)

The Board has the authority in determining, defining and implementing the environmental control standards applicable in the state of Illinois to subpoena and compel the attendance of witnesses and the production of evidence reasonably necessary to resolve the matter under consideration at hearing. (Section 5(e) of the Act.) The Board believes that the proposed procedure is an equitable solution to the issue. If the Agency believes the scoring requirement is made burdensome through submission of an unreasonable number of compounds, it may file the appropriate motion to the Board for relief. Therefore, the Board declines to alter Section 232.500(c) of the proposal.

The Agency has also requested that the Board remove subsection (d) of Section 232.500. This subsection states that the Agency will propose an update of the list on a two year schedule. The Agency testified at hearing that it would "commit" to doing this, but again objected that the Board "does not have the authority to direct the Agency to score or to propose contaminants for listing". (3R. 17.)

The Board believes that the language contained in Section 232.500(d) should remain in the proposed regulations. The Agency originally proposed the language contained in Section 232.500(d). That language has appeared in every version of the proposal over two years and through five hearings since the Agency filed its Amended Proposal of Regulations on April 17, 1990. The language gives at least minimal structure to the listing/delisting process and provides a reason for environmental and citizen groups to remain in periodic contact with the Agency regarding proposals. Retaining the language will assist in fostering coordinated listing and delisting petitions, rather than a piecemeal approach. In the event no update is necessary at the end of a two-year period, the Agency may file a motion which so states.

Section 232.Appendix A. "List of Toxic Air Contaminants"

This appendix contains the listing of the compounds found by the Board to be toxic air contaminants pursuant to Section 232.200. The Chemical Abstract Service Number is also given. The list adopted today consists of 264 compounds and is altered from the second first notice order by the deletion of ammonia and the addition of styrene.

The Board notes that the substances listed in Appendix A are those that, at this time, have been reviewed, scored, and subsequently proposed by the Agency and that other substances not proposed by the Agency may exist which have a toxicity score of 3 or greater or which may be listed on one of the four carcinogen references specified in Section 232.320. The Agency has testified that it has not yet reviewed and scored every substance with the potential to be a toxic air contaminant. (1R. 425, 427-8.) The Board also notes that the Agency testified that it has not proposed for listing as a toxic air contaminant any carcinogen included in one or more of the four carcinogen references (i.e. meeting the criteria of Section 232.320) if that carcinogen falls within one or more of the following five groups: (1) it is a drug and/or research chemical falling within the exemption provided under Section 9.5(e)(4) of the Act; (2) it is an industrial activity or process associated with increased incidence of cancer among workers engaged in such activity or process; (3) it is an individual element or compound from a family of compounds that are already listed as a toxic air contaminant; (4) it is a naturally occurring compound of mineral, plant or microbiological origin not associated with industrial processes; and (5) it is a carcinogen for which the Agency has not made a determination as to whether they fit in the above four groups or is associated with an industrial process. (2R. 44-49 and Exh. 26, Tables 1-5.) The Board anticipates that the Agency will be reviewing and scoring additional compounds for future update proposals and that Appendix A will be expanded to include these compounds.

Section 232.Appendix B. "Additional Procedures for Calculating the Chronic Toxicity Score"

This appendix contains a method to select an appropriate chronic toxicity study and a general equation for obtaining the correct dose to be used in calculating a chronic toxicity score. This appendix has not been altered from the second first notice proposal of regulations.

Section 232.Appendix C. "Carcinogens (Categories A, B1, and B2) listed on the Integrated Risk Information System (IRIS) as of December 31, 1989 (United States Environmental Protection Agency, Office of Health and Environmental Assessment)"

This appendix contains a listing of compounds which have been classified as A, B1, or B2 carcinogens by USEPA within the IRIS database. The appendix is necessary because this list cannot be incorporated by reference as it is a subset of an electronic database rather than a document and is cited in Section 232.320 "Carcinogen Classification". The content of this list has remained unchanged since the Agency's amended proposal of regulations although the Board has rearranged the wording in the title to clarify the nature of the appendix.

Chemical Specific Challenges

Agricultural Fertilizers and Pesticides The Illinois Farm Bureau, Growmark and the Illinois Fertilizer and Chemical Association appeared at the Board's January 7, 1992, hearing and also submitted public comments regarding the inclusion in the second first notice proposal of many agricultural fertilizer and pesticides. (PCs 52, 53, and 59.) The objections of these groups to the inclusion of ammonia as it may impact agricultural fertilizers is discussed in the section of this opinion entitled "ammonia", all other portions of the comments will be discussed here.

The objections of these groups can be summarized as follows. The agribusiness industry states that EPA held meetings with the affected public regarding the proposed regulations in late 1989, prior to the Agency's proposal to the Board. Growmark states that after much discussion, the Agency agreed that pesticides and fertilizers would not be included in the list. However, at a subsequent point, compounds were re-added, despite the understanding.

The commenters contend that the Agency has no authority to regulate pesticide storage or handling which is already regulated under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). They also expressed concern that monitoring could impose a tremendous burden and future rules may prevent pesticide application. (PCs 52 and 53.) In a post-hearing public comment,

the agribusiness community identified the agricultural pesticides and fertilizers of concern. (PC 63.)

The Agency stated at hearing that use of pesticides "has not been a major problem" as far as air toxicity is concerned and that the Agency's primary focus (for control) will be placed upon stationary sources. (3R. 165.)

The Board has reviewed the assertions of the agribusiness industry regarding procedural impropriety. (The Board notes that the initial toxic air contaminant list filed with the Board in the Agency's January 1990 proposal contained many of the chemicals of concern to the agribusiness industry.) Those early Agency proposals contained a list of from 80 to 130 chemicals. Later the Agency expanded the list to include chemicals which may not be emitted in Illinois. At that time the list expanded from approximately 130 to the present 264 chemicals or classes of chemicals. At no point did the Agency assert that the inclusion or exclusion of chemicals from the list was premised upon considerations of whether the chemical would be used in the agribusiness industry or premised upon agreements with the agribusiness industry. To the best of the Board's knowledge, the chemical lists in the Agency proposals have been premised exclusively on whether the chemicals met the stated criteria for toxicity or carcinogenicity. In addition, the Agency has not responded to the assertions of an agreement to not include agricultural chemicals on the list. Such assertions regarding Agency agreements are not relevant to the adoption of the list in today's Board proposal.

As far as the procedures for adoption of a chemical list by the Board is concerned, no procedural impropriety exists. The Board adopted for first notice a list on April 26, 1990. That list of 84 chemicals of classes of chemicals was published for first notice in accordance with all procedural requirements. Later, on September 26, 1991, the Board revised the proposal and expanded the list of toxic air contaminants to about 264 chemicals or classes of chemicals. That second first notice was also published for first notice in accordance with all procedural requirements. The list adopted today consists of 264 compounds and is altered from the second first notice only by the deletion of ammonia and the addition of styrene. Thus, for each chemical on today's list, the Board has provided the appropriate notice and publication under Illinois law.

In addition, the Board notes that the agribusiness community's participation in this proceeding began at least as early as November 25, 1991 with Public Comment 44 from the Illinois Fertilizer and Chemical Association. This was shortly after the September 26, 1991 Second First Notice, and well before the public hearing on January 7, 1992. Also, the agribusiness community provided testimony at hearing and provided comments

both before and after the hearing.

The Illinois Farm Bureau (PC 53) asserts that the cost of monitoring chemicals would be excessive. (See also PC 52.) The Board notes that the comments presume that monitoring "equipment" will be required at each farm and presume that such equipment will be expensive. No such decision has been reached in this proceeding. The agribusiness community has not provided comments to demonstrate that inclusion of the listed chemicals alone will cause a technically infeasible or economically unreasonable burden on the agribusiness community. Nor have those comments indicated any disproportionate impact on the agribusiness community compared to that anticipated in other aspects of society by the General Assembly in adopting the requirements for listing of toxic air contaminants.

In large part, the agribusiness community concerns seem to address not individual chemicals and their toxicity or carcinogenicity, but rather address that fact that these chemicals are employed in an agricultural setting and are subject to controls under other statutes. The Board notes that the obligation to adopt such listing is contained in Section 9.5 of the Act and are subject to the exclusions of Section 9.5(e) which provides:

> e. The requirements of this Section shall not apply to the following:
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> 1. retail dry cleaning operations;
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> 2. retail and noncommercial storage and handling of motor fuels;
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> 3. combustion processes using only commercial fuel, including internal combustion engines;
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> 4. incidental or minor sources including laboratory-scale operations, and such other sources or categories of sources which are determined by the Board to be of minor significance.

Nothing in this Section provides an exclusion for chemicals used in agriculture. Further, pesticides and agrichemical facilities are certainly contemplated as within the purview of the Act. (See Section 3.74 and 3.77 of the Act.) The Board must conclude that no such generalized exclusion is authorized in this proceeding.

The legislation mandating the development of the toxic air contaminant list requires inclusion of any air contaminant which "may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or may pose a significant threat to human health or the environment". (Ill. Rev. Stat. 1991, ch. 111 1/2, par. 1009.5(c).) The hearings held by the Board regarding toxic air contaminants have focussed upon the Agency's criterion for determining whether these characteristics were met. The agribusiness community's comments mainly focus on the control strategy to be pursued, not whether the air contaminants meet the statutory definition or the developed criterion. However, as the Agency has testified, it has not yet decided upon a control strategy for the listed chemicals and compounds or whether control necessitates monitoring. We find therefore, that promulgation of this list does not have the effect that the agribusiness community is concerned about; rather these arguments must wait until the Agency unveils its control strategy. The Board welcomes the continued participation of these groups.

Tetrachloroethylene and Trichloroethylene On December 2, 1991, the Halogenated Solvents Industry Alliance (HSIA) filed its motion to reconsider the listing of tetrachloroethylene and trichloroethylene as toxic air contaminants. The Illinois Chapter of the Sierra Club filed a response on December 5, 1991; DENR on December 16, 1991. The Agency filed its response on March 27, 1992. HSIA requested that the Agency reconsider the listing of these two chemicals. Tetrachloroethylene, HSIA stated, should be deleted from the list because it did not meet the scoring procedure of Section 232.320. However, the Agency's review of tetrachloroethylene showed this contention to be erroneous. (PC 55.) Tetrachloroethylene has been identified as an IARC 2B and as an National Toxicological Program NTP "Anticipated Human Carcinogen". Tetrachloroethylene was deleted from the USEPA - classified Group B2 list of carcinogens. It was not, however, reclassified as a IRIS Group C carcinogen. The classification is still pending. Therefore, we find no reason to delist tetrachloroethylene at this time.

HSIA also argues for the delisting of trichloroethylene based upon its carcinogen classification. However, as the Agency pointed out, trichloroethylene is not listed as a toxic air contaminant due to its carcinogenicity, but due to its toxicity score of 4. Because of its toxicity score, trichloroethylene should remain listed as a toxic air contaminant.

Styrene In the second first notice opinion, the Board responded to a request by the Styrene Information and Research Center (SIRC) to delist styrene and styrene oxide. The Board proposed to delist styrene because of the significance of a final rulemaking of the Department of Labor Occupational Health and

Safety Administration (OSHA) in which OSHA determined that "the current evidence on styrene's carcinogenicity does not support its classification in the final rule as a carcinogen." (Second First Notice Opinion, pp. 17-18.) The Board declined to delist styrene oxide because no significant additional data were provided to the Board by SIRC to give the Board reason to believe that styrene oxide does not qualify as a toxic air contaminant.

At hearing and in post-hearing comments, the Agency expressed opposition to the delisting of styrene stating that the Board has misinterpreted the actions of OSHA. (PC 62, p. 4.) The Agency disputes SIRC's assertion that OSHA, like USEPA, uses a "weight-of-evidence" approach to assess the carcinogenic potential of chemical substances. After a careful re-reading of the proposed and final OSHA rule, the Board is persuaded to agree with the Agency. OSHA presents only limited comments regarding the weakness of some animal and human studies and does not discuss any other data concerning styrene carcinogenicity. If OSHA utilized a "weight-of-evidence" approach, it is not spelled out in either the proposed or final rule and absent evidence to the contrary, the Board must assume that it was not used.

However, due to the degree of attention this issue has received at hearing and in comments, the Board will re-review the data on record regarding styrene to determine whether styrene meets the definition of a toxic air contaminant.

Pursuant to Section 232.500 of the second first notice proposal for R90-1, a substance may be delisted from the toxic air contaminant (TAC) list if the petitioner brings to the Board evidence that shows that the compound does not "cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or *** pose a significant threat to human health or the environment". (Ill. Rev. Stat. 1991, ch. 111 1/2, par. 1009.5(c).)

In the case of styrene, the Board has the following information on record. The Agency gave styrene an acute lethality score of "1" and did not have the data to calculate a chronic toxicity score. This results in a toxicity score of "1"; a score of "3" is necessary to "list" a compound as a TAC. SIRC did not submit any information regarding the toxicity scoring procedure so the Board must assume that SIRC does not dispute this scoring.

The Agency listed styrene as a TAC on the basis of the IARC "2B" carcinogen classification. IARC uses three schemes for classification within the "2B" category:

1. limited evidence of carcinogenicity in humans with less than sufficient evidence in experimental animals; or

2. inadequate evidence of carcinogenicity in humans or no human data with sufficient evidence in animals; or

3. inadequate evidence of carcinogenicity in humans or no evidence in humans with limited evidence in animals, together with supporting evidence based on other relevant data.

IARC classified styrene as a "2B" carcinogen based on the third criteria.

IARC determined that the evidence was inadequate to name styrene as a human carcinogen. Three studies suggest an association between leukemia and lymphomas and exposure to styrene. However, those developing leukemia had also been exposed to other agents, like colorants, benzene, ethylene oxide, and 1,3-butadiene. Another study showed no excess mortality from cancer. Four other studies were considered uninformative based on the study design. (IEPA Exh. 8.)

IARC considered that the evidence was limited with regard to animal carcinogenicity. In rats, no statistically significant increase in tumor incidence was observed when styrene was ingested. In an ingestion study with mice and rats of both sexes, an increase of lung tumors was observed only in male mice. Another study indicated a small, nonstatistically significant increase in brain tumors in rats for both ingestion and inhalation exposure. (IEPA Exh. 8.)

IARC also considered data that showed genotoxic and mutagenic effects of styrene exposure (chromosomal aberrations, DNA strand breaks, chromatid exchanges in humans and animals) and because of this other relevant data placed styrene in the "2B" category. (IEPA Exh. 8.)

At hearing, SIRC disputed the use of genotoxic data in the IARC determination. In testimony, Dr. Daniel P. Boyd described the history of the "2B" ranking:

> "For styrene, the 1987 working group concluded that the evidence for carcinogenicity in humans was inadequate and that the evidence for carcinogenicity in animals was limited. These conclusions were consistent with previous IARC evaluations of styrene, since there was no new human or animal carcinogenicity data to be considered between supplement 4 and supplement 7."
>
> "However, the overall evaluation of styrene was changed at the '87 meeting from group 3, not classifiable as to its carcinogenicity in humans, to group 2B, possibly carcinogenic to humans as a result of the changes in the structure and criteria for the classifications,

> which formalized the use of genotoxicity data for upgrading the classification. The evidence for activity in genotoxicity tests was considered to be sufficient by IARC, and hence the classification for styrene was upgraded...even though there was no new human and no new animal carcinogenicity data that warranted the upgrade on the genotoxicitytoxicity [sic] issue." (1R. at 835-7.)

The above comments indicate that the argument in listing styrene as a carcinogen, and thus as a TAC, centers on styrene's reported genotoxicity/mutagenicity rather than the evidence on carcinogenicity. Although mutagenicity is not directly addressed in the methodology proposed by the Agency, the statute and testimony by the Agency indicate that mutagenic properties may qualify a compound as a TAC.

Section 9.5(a)(1) of the Act states:

> The General Assembly finds that:
>
> > 1. The public health and welfare may be endangered by the release of toxic contaminants into the air which are carcinogenic, teratogenic, mutagenic or otherwise injurious to humans or the environment. (Emphasis added)

Dr. Thomas Hornshaw, speaking of behalf of the Agency, commented at hearing on how the proposed methodology addresses mutagens:

> "We haven't really addressed the mutagens. Mutagenicity is considered by the national and international authorities which develop the carcinogen rankings and it's addressed through them. We don't address it our own selves." (1R. at 162.)

Thus, it appears that the Agency has relied upon the expertise of the cancer research institutions, like IARC, to determine whether mutagenicity data warrants classification of a compound among carcinogens. We believe this to be reasonable procedure for proposing a chemical for listing given the Agency's available resources and expertise. No specific objection to the results of IARC studies of styrene's mutagenicity was submitted.

Therefore, upon further review we find that SIRC has not provided enough scientific evidence to disqualify styrene from the definition of a toxic air contaminant and that styrene should be listed as such in Section 232.Appendix A.

Ammonia On February 20, 1992, the Illinois Environmental Regulatory Group (IERG) filed its post-hearing comments. (PC 60.)

The IERG questioned the acute lethality score for ammonia and attached the comments of Dr. Joseph A. Scimeca, Senior Research Scientist, Kraft General Foods, Inc., in support. CF Industries Inc.'s post-hearing comment (PC 61) also called for re-calculation of ammonia acute lethality score and attached several studies in support. Dr. Scimeca questioned the Agency's acute lethality score of "2" regarding ammonia, concluding that the Agency's use of a study by Weedon et al. was inappropriate. First, the exposure period used in the study exceeded the maximum exposure time defined in the Agency proposal. Second, an LC50 value was impossible to determine based on data from a study in which the sole exposure resulted in the death of only 12.5% of the tested animal population. Dr. Scimeca concluded that a review of the scientific literature in this area reveals data which would result in an acute lethality score of "1" for ammonia. The scientific literature supplied by CF Industries supports this view. These studies each document that the LC50 for ammonia is greater than 5,000 mg/m^3. Accordingly, the Agency's scoring system to the new data, results in an application of the acute lethality score for ammonia of "1" not "2". The Agency, after review, agreed. (PC 62.) The Agency rescored the acute lethality score for ammonia as "1" admitting that the sole study used in its original scoring was inappropriate. The Agency stated that its "reliance upon computerized databases such as the Registry for Toxic Effects of Chemical Substances and secondary literature sources occasionally results in the use of an inappropriate data point for scoring purposes. ...Additionally, this effort demonstrates the way in which the proposed narrative standard amendment operates in the proposal and review of the listing of a TAC."

The Board has removed ammonia from the list of toxic air contaminants based upon the public comments and the Agency's conclusion that its scoring was inappropriate and therefore ammonia's inclusion was erroneous.

Xylene and 1, 1, 1- Trichloroethane In its second first notice opinion and order, the Board inadvertently omitted a discussion regarding the Coalition of Consumer Right's request that xylene and 1, 1, 1- trichloroethane be added to the list of toxic air contaminants. The Agency has testified that they had reviewed these two chemicals and found them to not meet the basis for listing as a toxic air contaminant. Our review of the information contained in the record confirms the Agency's position. Therefore xylene and 1, 1, 1- trichloroethane will not be added to the list of toxic air contaminants at this time.

Inclusion of Federal Hazardous Air Pollutants

The public comments filed by the Sierra Club Coalition for Consumer Rights, and Chicago Lung Association (PC 56) and Ford Motor Company (PC 48) recommended adding the Clean Air Act

Amendments hazardous air pollutants (HAPs) list to the Illinois TAC list. Recognizing that inclusion of some contaminants would necessarily mean additional time to receive comments and perhaps hearings on the contaminants, the Sierra Club offered the alternative that the HAPs could be included in subdocket B. The Board also recognizes that additional delay in the promulgation of these rules would be counterproductive, and therefore chooses to revisit this issue at a later time.

ORDER

The following rules are hereby proposed for second notice. The Board directs the Clerk of the Board to submit these rules to the Joint Committee on Administrative Rules for second notice review.

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

PART 232
TOXIC AIR CONTAMINANTS

SUBPART A: GENERAL PROVISIONS

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

Section
232.300 Purpose
232.310 Procedures for Determining the Toxicity Score
232.320 Carcinogen Classification

SUBPART E: LISTING AND DELISTING

Section
232.500 Procedures for Listing and Delisting Toxic Air Contaminants

APPENDIX A: List of Toxic Air Contaminants
APPENDIX B: Additional Procedures for Calculating the Chronic Toxicity Score

APPENDIX C: Carcinogens (Categories A, B1, and B2) listed on the Integrated Risk Information System (IRIS) as of December 31, 1989 (United States Environmental Protection Agency, Office of Health and

Environmental Assessment)

AUTHORITY: Implementing Section 9.5 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1991, ch. 111 1/2, pars. 1009.5 and 1027).

SOURCE: Adopted in R90-1 at 16 Ill. Reg. effective

SUBPART A: GENERAL PROVISIONS

Section 232.100 Introduction

This Part establishes a program to identify toxic air contaminants. This Part includes a list of toxic air contaminants (Appendix A), the procedures to determine a toxic air contaminant and the procedures to amend the list.

Section 232.110 Incorporations 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 1989-90 (1989). Document can be obtained from: 6500 Glenway Avenue, Building D-7, Cincinnati, Ohio 45211-4438.

Good Laboratory Practice Standards, 21 CFR 58 (1990).

Good Laboratory Practice Standards, 40 CFR 160 (1989).

Good Laboratory Practice Standards, 40 CFR 792 (1990).

Organization for Economic Co-operation and Development (OECD). OECD Guidelines For Testing of Chemicals, Appendix: Good Laboratory Practice [c(81)30(Final)] (November, 1989). Document can be obtained from: OECD Publications and Information Centre, 2001 L Street, N.W., Suite 700, Washington, D.C. 20036-4095.

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, Virginia 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, New York 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.

"ACGIH" means the American Conference of Governmental Industrial Hygienists.

"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.

"Critical gestation days" means the days during which the formation and differentiation of organs and organ systems occurs during embryonic development.

"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.

"IARC" means the World Health Organization's International Agency for Research on Cancer.

"IRIS" means the USEPA's Integrated Risk Information System.

"LC50" means the concentration in the air of a contaminant that kills, or is estimated to kill, 50 per cent 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.

"NTP" means the United State Department of Health and Human Services, Public Health Services' National Toxicological Program.

"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.

"Toxic air contaminant" means a contaminant identified pursuant to Section 232.200 and listed in Appendix A.

Section 232.130 Applicability

The requirements of this Part 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, INCLUDING INTERNAL COMBUSTION ENGINES; AND

d) INCIDENTAL OR MINOR SOURCES INCLUDING LABORATORY-SCALE OPERATIONS, AND SUCH OTHER SOURCES OR CATEGORIES OF SOURCES WHICH ARE DETERMINED BY THE BOARD TO BE OF MINOR SIGNIFICANCE. (Section 9.5(e) of the Act)

SUBPART B: DETERMINATION OF A TOXIC AIR CONTAMINANT

Section 232.200 Determination of a Toxic Air Contaminant

a) Contaminants found by the Board to be Toxic Air Contaminants pursuant to subsections (b) or (c), below, shall be listed in Appendix A.

b) A TOXIC AIR CONTAMINANT IS A CONTAMINANT WHICH the Board finds MAY CAUSE OR SIGNIFICANTLY CONTRIBUTE

TO AN INCREASE IN MORTALITY OR AN INCREASE IN SERIOUS IRREVERSIBLE OR INCAPACITATING REVERSIBLE ILLNESS, OR MAY POSE A SIGNIFICANT THREAT TO HUMAN HEALTH (Section 9.5(c) of the Act)

c) The Board shall find that a contaminant is a Toxic Air Contaminant upon a determination that:

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

2) The contaminant is classified as a carcinogen according to Section 232.320; and

3) The contaminant meets the statutory definition set forth in subsection (b), above.

d) Any person can petition the Board to list or delist a toxic air contaminant pursuant to the requirements of Section 232.500. The Board will consider such a petition a proposal for rulemaking subject to the requirements of 35 Ill. Adm. Code Part 102.

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 or delist toxic air contaminants in Appendix A.

Section 232.310 Procedures 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
500-4,999 mg/cu. m	2
5,000-50,000 mg/cu. m	1
Greater than: 50,000 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
500-5,000 mg/kg	1
Greater than: 5,000 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

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

2) Procedure for Determining the Severity of Effects Score

The Severity of Effects Score is a number based upon the category of 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:

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 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.

iii) Category III includes: organs, the impairment or loss of which is not life threatening but may result in functional or emotional handicaps; adverse effect on an immune function which is not life threatening; 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, Pharynx.

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 Severity of Effects Score for any level of effect observed in an organ belonging to a specified organ category is derived from the following table:

		Organ Category I	II	III
Level of Effect	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.

3) Additional procedures for calculating the Chronic Toxicity Score are described in Appendix B.

Section 232.320 Carcinogen Classification

a) For purposes of this Part, the Agency will consider a contaminant to be a carcinogen if it is classified in the following manner:

1) A Category A1 or A2 Carcinogen by AGCIH; or
2) A Category 1 or 2A/2B Carcinogen by IARC; or

3) A "Human Carcinogen" or "Anticipated Human Carcinogen"

by NTP; or

4) A Category A or B1/B2 Carcinogen by the United States Environmental Protection Agency (USEPA) in IRIS or a Final Rule issued in a Federal Register notice by the USEPA as of the effective date of this regulation.

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

SUBPART E: LISTING AND DELISTING

Section 232.500 Procedures for Listing and Delisting Toxic Air Contaminants

a) Any person may submit a regulatory proposal to the Board to list or delist a toxic air contaminant.

b) The proposal to list a contaminant as a toxic air contaminant, or to delist a toxic air contaminant, must include, at a minimum, the following:

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

2) The basis for listing or delisting pursuant to Section 232.200 (b) or (c). This shall include but is not limited to, a showing of one of the following:

A) The toxicity score or carcinogen classification is correctly determined pursuant to the Subpart C procedures;

B) The Subpart C procedure for determining a toxicity score or carcinogen classification is not appropriate for the contaminant;

C) The Subpart C procedure for determining a toxicity score or carcinogen classification is incorrectly applied for the contaminant;

D) The studies used are inadequate for the purposes of the Subpart C procedure; or

E) Additional or new studies should be considered in a determination to list or delist a contaminant.

3) A copy of each study or report used to justify the proposal.

c) The Agency shall participate in each proposal to list or delist a toxic air contaminant and must provide the Board with a recommendation as to advisability of listing or delisting. Such recommendation must include a toxicity scoring pursuant to Section 232.300 and a carcinogen classification pursuant to Section 232.310.

d) 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.APPENDIX A: List of Toxic Air Contaminants

Chemical Name	Chemical Abstract Service Number
Acetaldhyde	75-07-0
Acetamide	60-35-5
Acetonitrile	75-05-8
Acetophenone	98-86-2
Acrolein	107-02-8
Acrylamide	79-06-1
Acrylic acid	79-10-7
Acrylonitrile	107-13-1
Aldrin	309-00-2
Allyl chloride	107-05-1
2-Aminoanthraquinone	117-79-3
4-Aminoazobenzene	60-09-3
o-Aminoazotoluene	93-56-3
4-Aminobiphenyl	92-67-1
1-Amino-2-methylanthraquinone	82-28-0
Amitrole	61-82-5
Aniline	62-53-3
o-Anisidine	90-04-0
o-Anisidine hydrochloride	134-29-2
Antimony	7440-36-0
Arsenic	7440-38-2
Asbestos (friable)	1332-21-4
Azobenzene	103-33-3
Benz(a)anthracene	56-55-3
Benzene	71-43-2
Benzidine	92-87-5
Benzo(a)pyrene	50-32-8
Benzo(b)fluoranthene	205-99-2
Benzo(j)fluoranthene	205-82-3
Benzo(k)fluoranthene	207-08-9
Benzotrichloride	98-07-7
Benzyl chloride	100-44-7

Benzyl violet	1694-09-3
Beryllium	7440-41-7
Beryllium oxide	1304-56-9
Biphenyl	92-52-4
Boron trifluoride	7637-07-2
Bromoform	75-25-2
1,3-Butadiene	106-99-0
Butyl benzyl phthalate	85-68-7
beta-Butyrolacetone	3068-88-0
C.I. Basic Red 9 monohydrochloride	569-61-9
Cadmium	7440-43-9
Cadmium oxide	1306-19-0
Caprolactam	105-60-2
Carbaryl	63-25-2
Carbofuran	1563-66-2
Carbon black	1333-86-4
Carbon disulfide	75-15-0
Carbon tetrachloride	56-23-5
Carbosulfan	55285-14-8
Chloramben	133-90-4
Chlordane	57-74-9
Chlorinated dibenzodioxins	--
Chlorinated dibenzofurans	--
Chlorendic acid	115-28-6
Alpha-Chlorinated toluenes	--
Chlorinated paraffins (C12, 60% chlorine)	108171-26-2
Chlorine	7782-50-5
Chloroacetic acid	79-11-8
Chlorobenzene	108-90-7
Chloroform	67-66-3
Chloromethyl methyl ether	107-30-2
4-Chloro-2-methylpropene	563-47-3
4-Chloro-o-phenylenediamine	95-83-0
p-Chloro-o-toluidine	95-69-2
Chloroprene	126-99-8
Chromium	7440-47-3
Chromium VI	18540-29-9
Chrysene	218-01-9
Coal tar (pitch) volatiles	65996-93-2
Cobalt	7440-48-4
Coke Oven Emissions	--
Copper	7440-50-8
p-Cresidine	120-71-8
Creosote (Coal)	8001-58-9
Cresol (mixed isomers)	1319-77-3
Cyanazine	21725-46-2
Cyclohexanone	108-94-1
DDD	72-54-8
DDE	72-55-9
DDT	50-29-3
2,4-Diaminoanisole	615-05-4
2,4-Diaminoanisole sulfate	39156-41-7

4,4′-Diaminodiphenyl ether	101-80-4
2,4-Diaminotoluene	95-80-7
Dibenzo(a,h)acridine	226-36-8
Dibenzo(a,j)acridine	224-42-0
Dibenzo(a,h)anthracene	53-70-3
Dibenzo(a,e)pyrene	192-65-4
Dibenzo(a,h)pyrene	189-64-0
Dibenzo(a,i)pyrene	189-55-9
Dibenzo(a,l)pyrene	191-30-0
Dibutyl phthalate	84-74-2
1,2-Dibromo-3-chloropropane	96-12-8
1,2-Dibromoethane [Ethylene dibromide]	106-93-4
3,3′-Dichlorobenzidine	91-94-1
3,3′-Dichlorobenzidine dihydrochloride	612-83-9
Dichloroethyl ether	111-44-4
2,4-Dichlorophenoxyacetic acid [2,4-D]	94-75-7
1,2-Dichloropropane	78-87-5
1,3-Dichloropropylene	542-75-6
Dichlorvos	62-73-7
Dieldrin	60-57-1
Diepoxybutane	1464-53-5
1,2-Diethylhydrazine	1615-80-1
Di(2-ethylhexyl) phthalate	117-81-7
Diethyl sulfate	64-67-5
Diglycidyl resorcinol ether	101-90-6
3,3′-Dimethoxybenzidine	119-90-4
Dimethyl acetamide	127-19-5
4-Dimethylaminoazobenzene	60-11-7
3,3′-Dimethylbenzidine [o-Tolidine]	119-93-7
Dimethylcarbamoyl chloride	79-44-7
Dimethyl formamide	68-12-2
1,1-Dimethylhydrazine	57-14-7
1,2-Dimethylhydrazine	540-73-8
Dimethyl sulfate	77-78-1
Dinitrocresol	534-52-1
2,4-Dinitrophenol	51-28-5
2,4-Dinitrotoluene	121-14-2
1,4-Dioxane	123-91-1
1,2-Diphenylhydrazine	122-66-7
Disulfoton	298-04-4
Endothall	145-73-3
Epichlorohydrin	106-89-8
2-Ethoxyethanol	110-80-5
Ethyl acrylate	140-88-5
Ethylene dichloride	107-06-2
Ethylene oxide	75-21-8
Ethylene thiourea	96-45-7
Etridiazole	2593-15-9
FMC-67825	95465-99-9
Fluorine	7782-41-4
Folpet	133-07-3
Formaldehyde	50-00-0

Furmecyclox	60568-05-0
Heptachlor	76-44-8
Heptachlor epoxide	1024-57-3
Hexachlorobenzene	118-74-1
Hexachloro-1,3-butadiene	87-68-3
Hexachlorocyclopentadiene	77-47-4
Hexachlorodibenzo-p-dioxin	19408-74-3
Hexachloroethane	67-72-1
Hexamethylphosphoramide	680-31-9
Hydrazine	302-01-2
Hydrazine sulfate	10034-93-2
Hydrogen cyanide	74-90-8
Indeno(1,2,3-cd)pyrene	193-39-5
Isophorone diisocyanate	4098-71-9
Lead	7439-92-1
Lindane (alpha)	319-84-6
Lindane (beta)	319-85-7
Lindane (gamma)	58-89-9
Lindane (mixed isomers)	608-73-1
Linuron	330-55-2
Malathion	121-75-5
Manganese	7439-96-5
Mercury	7439-97-6
2-Methoxyethanol	109-86-4
2-Methoxyethanol acetate	110-49-6
5-Methylchrysene	3697-24-3
4,4'-Methylenebis(2-chloroaniline)	101-14-4
Methylenebis(phenylisocyanate)	101-68-8
4,4'-Methylenebis(N,N'-dimethyl) benzenamine	101-61-1
Methylene chloride	75-09-2
4,4'-Methylenedianiline	101-77-9
4,4'-Methylenedianiline dihydrochloride	13552-44-8
Methyl hydrazine	60-34-4
Methyl iodide	74-88-4
Methyl mercaptan	74-93-1
N-Methyl-N'-nitro-N-nitrosoguanidine	70-25-7
Metolachlor	51218-45-2
Michler's Ketone	90-94-8
Mirex	2385-85-5
Monoethanolamine	141-43-5
beta-Naphthylamide	91-59-8
Nickel	7440-02-0
Nitric acid	7697-37-2
Nitrilotriacetic acid	139-13-9
Nitrobenzene	98-95-3
5-Nitro-o-anisidine	99-59-2
2-Nitropropane	79-46-9
N-Nitroso-n-butyl-N-(3-carboxypropyl) amine	38252-74-3
N-Nitroso-n-butyl-N-(4-hydroxybutyl) amine	3817-11-6
N-Nitrosodi-n-butylamine	924-16-3
N-Nitrosodiethanolamine	1116-54-7
N-Nitrosodiethylamine	55-18-5

N-Nitrosodimethylamine	62-75-9
N-Nitrosodiphenylamine	86-30-6
N-Nitrosodi-n-propylamine	621-64-7
N-Nitroso-N-ethylurea	759-73-9
3-(N-Nitrosomethylamino) propionitrile	60153-49-3
N-Nitrosomethylethylamine	10595-95-6
N-Nitroso-N-methylurea	684-93-5
N-Nitrosomethylvinylamine	4549-40-0
N-Nitrosomorpholine	59-89-2
N-Nitrosonornicotine	16543-55-8
N-Nitrosopiperidine	100-75-4
N-Nitrosopyrrolidine	930-55-2
N-Nitrososarcosine	13256-22-9
Nitrofen	1836-75-5
Pentachloronitrobenzene	82-68-8
Pentachlorophenol	87-86-5
Peracetic acid	79-21-0
Phenol	108-95-2
Phenylhydrazine	100-63-0
Phorate	298-02-2
Phosphorus	7723-14-0
Phosphorus oxychloride	10025-87-3
Phosphorus pentachloride	10026-13-8
Polybrominated biphenyls	--
Polychlorinated biphenyls	1336-36-3
Potassium bromate	7758-01-2
Propane sultone	1120-71-4
beta-Propiolactone	57-57-8
Propyleneimine	75-55-8
Propylene oxide	75-56-9
Pyrene	129-00-0
Quinoline	92-22-5
Selenium	7782-49-2
Sodium borate	1303-96-4
Styrene	100-42-5
Styrene oxide	96-09-3
Sulfallate	95-06-7
Sulfuric acid	7664-93-9
Terbufos	13071-79-9
1,1,2,2-Tetrachloroethane	79-34-3
Tetrachloroethylene	127-18-4
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6
4,4'-Thiodianiline	139-65-1
Thiophenol	108-98-5
Thiourea	62-56-6
Thorium dioxide	1314-20-1
Toluene	108-88-3
Toluene-2,4-diisocyanate	584-84-9
Toluene-2,6-diisocyanate	91-08-7
o-Toluidine	95-53-4
o-Toluidine hydrochloride	636-21-5
p-Toluidine	106-49-0

Toxaphene	8001-35-2
1,2,4-Trichlorobenzene	120-82-1
Trichloroethylene	79-01-6
2,4,6-Trichlorophenol	88-06-2
Trimethyl benzene	25551-13-7
1,2,4-Trimethyl benzene	95-63-6
2,4,6-Trinitrotoluene	118-96-7
Tris(2,3-dibromopropyl) phosphate	126-72-7
Trypan blue	72-57-1
Urethane [Ethyl carbamate]	51-79-6
Vinyl bromide	593-60-2
Vinyl chloride	75-01-4
Vinylidene chloride	75-35-4
Antimony compounds Includes any unique chemical substance that contains antimony as part of that chemical's infrastructure	--
Arsenic compounds Includes any unique chemical substance that contains arsenic as part of that chemical's infrastructure	--
Beryllium compounds Includes any unique chemical substance that contains beryllium as part of that chemicals infrastructure	--
Cadmium compounds Includes any unique chemical substance that contains cadmium as part of that chemical's infrastructure	--
Chromium compounds Includes any unique chemical substance that contains chromium as part of that chemical's infrastructure	--
Cobalt compounds Includes any unique chemical substance that contains cobalt as part of that chemical's infrastructure	--
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 $Ca(CN)_2$	--
Lead compounds	

Includes any unique chemical substance that contains lead as part of that chemical's infrastructure

Manganese compounds --
Includes any unique chemical substance that contains manganese as part of that chemical's infrastructure

Mercury compounds --
Includes any unique chemical substance that contains mercury as part of that chemical's infrastructure

Nickel compounds --
Includes any unique chemical substance that contains nickel as part of that chemical's infrastructure

Section 232.APPENDIX B Additional Procedures for Calculating the Chronic Toxicity 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) of this appendix are identified or measured with adequate specificity to use the equations in subsection (b) of this appendix are to 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 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 items in subsection (a)(1)(A) are deemed to have been identified or measured, but which give inconsistent results, the

study must be selected by the following procedures:

i) In the event that two or more studies are laboratory animal toxicity studies, the study that is conducted in accordance with or consistent with Good Laboratory Practice Standards must be used. Good Laboratory Practice Standards are incorporated by reference in Section 232.110.

ii) In the event that the application of the procedure in subsection (i) fails to result in the selection of one study, then 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) of this appendix, 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);

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 (cu.m3/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/cu.m).

Chart 1
Summary of Physiological Parameters

Species	Water Intake L/kg/day	Food Intake kg/kg/day	Ventilation cu.m/kg/day
Cat	0.100	0.050	0.46
Dog	0.025	0.025	0.31
Guinea Pig	0.075	0.040	0.58
Human	0.029	0.025	0.26
Monkey	0.14	0.07	0.32
Mouse	0.25	0.15	1.44
Rabbit	0.065	0.030	0.46
Rat	0.10	0.050	0.66

Section 232.APPENDIX C: Carcinogens (Categories A, B1, and B2) listed on the Integrated Risk Information System (IRIS) as of December 31, 1989 (United States Environmental Protection Agency, Office of Health and Environmental Assessment)

Chemical Name	CAS Number	Category
Acetaldehyde	000075-07-0	B2
Acrylamide	000079-06-1	B2
Acrylonitrile	000107-13-1	B1
Aldrin	000309-00-2	B2
Aniline	000062-53-3	B2
Arsenic	007440-38-2	A
Azobenzene	000103-33-3	B2
Benzene	000071-43-2	A
Benzidine	000092-87-5	A
Benzo(a)pyrene	000050-32-8	B2
Benzyl chloride	000100-44-7	B2
Beryllium	007440-41-7	B2
Bis(2-ethylhexyl) phthalate	000117-81-7	B2
Bis(chloroethyl) ether	000111-44-4	B2
Bis(chloromethyl) ether	000542-88-1	A
1,3-Butadiene	000106-99-0	B2
Cadmium	007440-43-9	B1
Carbon Tetrachloride	000056-23-5	B2
Chlordane	000057-74-9	B2
Chloroform	000067-66-3	B2
Chloromethyl Methyl Ether	000107-30-2	A
Chromium(VI)	18540-29-9	A
Coke Oven Emissions	008007-45-2	A
Creosote	008001-58-9	B1
DDD	000072-54-8	B2
DDE	000072-55-9	B2
DDT	000050-29-3	B2
1,2-Dichloroethane	000107-06-2	B2

1,3-Dichloropropene	000542-75-6	B2
Dichlorovos	000062-73-7	B2
Dieldrin	000060-57-1	B2
Dimethyl Sulfate	000077-78-1	B2
1,4-Dioxane	000123-91-1	B2
1,2-Diphenylhydrazine	000122-66-7	B2
Epichlorohydrin	000106-89-8	B2
Ethylene Dibromide	000106-93-4	B2
Folpet	000133-07-3	B2
Formaldehyde	000050-00-0	B1
Furmecyclox	060568-05-0	B2
Heptachlor	000076-44-8	B2
Heptachlor Epoxide	001024-57-3	B2
Hexachlorocyclohexane, technical	000608-73-1	B2
alpha-Hexachlorocyclohexane	000319-84-6	B2
Hexachlorodibenzo-p-dioxin	019408-74-3	B2
Hydrazine, Hydrazine Sulfate (mixture)		B2
Lead and Compounds (Inorganic)		B2
4,4'-Methylenebis(N,N'-dimethyl) benzenamine	000101-61-1	B2
N-Nitroso-N-methylethylamine	010595-95-6	B2
N-Nitroso-di-n-butylamine	000924-16-3	B2
N-Nitrosodi-N-propylamine	000621-64-7	B2
N-Nitrosodiethanolamine	001116-54-7	B2
N-Nitrosodiethylamine	000055-18-5	B2
N-Nitrosodimethylamine	000062-75-9	B2
N-Nitrosodiphenylamine	000086-30-6	B2
N-Nitrosopyrrolidine	000930-55-2	B2
Nickel Carbonyl	013463-39-3	B2
Nickel Refinery Dust	007440-02-0	A
Nickel Subsulfide	012035-72-2	A
Polychlorinated Biphenyls	001336-36-3	B2
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 4th day of June, 1992 by a vote of 7-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board