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Chesapeake Bay Toxics of Concern List Information Sheets

Chesapeake Bay Program

Basinwide Toxics Reduction Strategy Commitment Report

May 1991

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Basinwide Toxics Reduction Strategy Commitment Report

Prepared by the Chesapeake Bay Program Toxics Subcommittee's
and
Living Resources Subcommittee's
Joint Criteria and Standards Workgroup

May 1991

Printed by the United States Environmental Protection Agency
for the
Chesapeake Bay Program

EXECUTIVE SUMMARY

The 1987 Chesapeake Bay Agreement identified the improvement and maintenance of water quality as the most critical elements in the overall restoration and protection of the Chesapeake Bay. In order to achieve a reduction of toxics consistent with the Water Quality Act of 1987, the Agreement called for the development and adoption of a Basinwide Toxics Reduction Strategy. The Strategy, adopted by the Chesapeake Executive Council in January 1989, contains a number of commitments in the areas of research, monitoring and toxics management necessary to achieve a comprehensive approach to toxics reduction in the Chesapeake Bay. One of the commitments specifies the creation of a Chesapeake Bay Toxics of Concern List and supporting matrix of information to be used to establish priorities for future toxics research and management initiatives.

The Chesapeake Bay Program's Toxics and Living Resources Subcommittees convened the joint Criteria and Standards Work Group in October 1989 to develop the Toxics of Concern List. The work group finalized its development approach in the form of a publicly reviewed workplan (Appendix A). After months of data collecting and analyzing of chemical ranking systems, ambient concentrations of toxic substances and aquatic toxicity data, the work group identified the toxic substances which represented immediate or potential threat to the Chesapeake Bay system. The initial Toxics of Concern List was derived using an interim process because all the necessary data bases and information systems described in the workplan were not available. This list and the supporting information (Appendix B) was presented and approved by both the Toxics Subcommittee and the Living Resources Subcommittee, with final approval by the Implementation Committee on January 31, 1991.

The toxic substances included on the initial Toxics of Concern List are:

Atrazine	Chrysene	Mercury
Benzo[a]anthracene	Chromium	Naphthalene
Benzo[a]pyrene	Copper	PCBs
Cadmium	Fluoranthene	Tributyltin
Chlordane	Lead	

The Basinwide Toxics Reduction Strategy requires the Toxics of Concern List to be reviewed and revised as necessary every two years after the initial list is developed. The work group plans to complete a revision of the initial list within one year in order to institutionalize a more comprehensive ranking and selection process, and then to follow the two year revision/update schedule outlined in the Strategy. Future revisions of the Toxics of Concern List will incorporate the latest available information to the Chesapeake Bay Program on point and nonpoint source loadings, ambient concentrations, aquatic toxicity, and federal and state regulations and/or restrictions.

**1990 TOXICS OF CONCERN LIST
CRITERIA AND STANDARDS WORK GROUP FINAL REPORT TO THE
TOXICS SUBCOMMITTEE**

This report presents the findings of the members of the Criteria and Standards Work Group who gave their time and expertise to produce this initial Toxics of Concern List (TOCL).

Mary Jo Garreis, Chair
Maryland Department of the Environment

Kathleen Bartholomew
Chesapeake Bay Foundation

Lance Himmelberger
Pennsylvania Dept. of
Environmental Resources

Richard Batiuk
U.S. EPA
Chesapeake Bay Liaison Office

Jessica Landman
Natural Resources Defense Council

Ray Fritz
U.S. Fish and Wildlife Service

Alan Pollock
Virginia Water Control Board

Michael Hirshfield
MD Dept. of Natural Resources

Mary Ellen Setting
MD Dept. of Agriculture

Lenwood Hall, Jr.
Wye Research Institute
University of Maryland

Bill Rue
E. A. Engineering, Science
& Technology

Arthur Hart
National Agricultural Chemicals Assn.

Randall Waite
U.S. EPA Region III

Robin Laird, Chesapeake Bay Liaison Office/Chesapeake Research Consortium, acting as staff to the Work Group, provided a significant contribution. Her efforts are largely responsible for the successful development of this list and supporting documentation.

The Work Group would also like to acknowledge the efforts of the following people who attended the Work Group's meetings and were instrumental in developing the initial Toxics of Concern List.

Richard Jackson
DuPont Company

Deirdre Murphy
Maryland Dept. of the Environment

Sarah Gerould
U.S. Fish and Wildlife Service

Chuck Prorok
Computer Sciences Corporation

RECOMMENDATIONS

'The Work Group established a set of recommendations for each toxic substance on the Toxics of Concern List (see Appendix B). The following is a cumulative list of all the recommendations developed for the toxic substances on the Toxics of Concern List.'

- (1) The research needs identified by the Work Group in its recommendations for each substance be made a priority for any research sponsored by the Toxics Subcommittee and the Chesapeake Bay Program.
- (2) The Toxic Loading Inventory development effort emphasize data collection for these toxic substances and those identified below as candidates for the Toxics of Concern List pending further review.
- (3) The pesticide usage surveys conducted in the Bay watershed be designed to ensure the inclusion of any pesticides on the TOCL and those toxic substances identified elsewhere in this report as potential candidates for the TOCL, pending further review.
- (4) Any research monitoring funded by the Chesapeake Bay Program or the Signatories to the Chesapeake Bay Agreement be required to submit the raw data from the research or monitoring to the Chesapeake Bay Program Computer Center in the appropriate format for easy inclusion. The documentation shall include the quality control/quality assurance procedures used to assure the validity of sample collection and analyses. Publication of data in peer reviewed literature should be encouraged.
- (5) Programs directed at the minimization or elimination of the discharge of these toxic substances target non-point as well as point sources.
- (6) The State signatories to the Bay Agreement give the substances listed as Toxics of Concern priority for consideration of water quality criteria adoption during their triennial review.
- (7) Monitoring programs in all media within the Bay watershed include these substances in order to further identify sources and quantify loadings to the Bay system. To ensure best use of limited resources, monitoring efforts should recognize the seasonal variations associated with certain substances such as pesticides.
- (8) Where monitoring demonstrates that concentrations of a particular toxic substance(s) in the ambient water column are elevated, the potential for toxicity impact should be investigated.
- (9) Where monitoring demonstrates that a toxic substance does not appear in quantities sufficient to cause an impact, discontinue monitoring.
- (10) Where monitoring and investigation show a toxic substance is causing an impact, or has reasonable potential to cause an impact, the development of water quality criteria should be given priority.
- (11) Where existing gaps in the acute and chronic toxicity data necessary for aquatic life water quality criteria development are identified, appropriate toxicity tests using Bay resident or other representative species necessary to complete the data base be given top priority in Bay research.

(12) The success of existing regulatory actions for the TOCL be evaluated in 1993 to determine the need for further controls. The evaluation should include a review of monitoring data, substance usage where appropriate, environmental trends, permitting controls, and enforcement actions.

(13) Formally adopted water quality criteria be integrated into the respective states' total regulatory program. Where available data demonstrate exceedance of criteria, states should initiate appropriate regulatory investigation and controls.

(14) Priority be given to the acquisition and integration of data into the Chesapeake Bay Program Computer Center database for use in revising the TOCL in the next year. This includes data from existing water column, tissue and sediment monitoring programs, and effluent and other sample data as well as the results of scientific investigations.

(15) The following management practices be considered for implementation:

(a) Aggressive public education campaigns be launched to educate the general public as to their role in preventing pollution in the Bay.

(b) Citizens be encouraged to conserve energy to save fossil fuels, thereby lessening pollution by:

- increasing home heating efficiency;
- servicing their home oil burners regularly to keep them running at peak efficiency;
- lowering home thermostats to 68° F. in the winter;
- using caulk and weather stripping to stop home heat loss;
- recycling used motor oil from cars, lawn mowers, and other mechanical devices at licensed service centers;
- repairing automotive leaks of fluids and oils; and
- careful handling and efficient use of fuels in recreational vehicles and boats.

(c) To limit pesticide application, IPM programs for home, garden and institutional use be developed.

(d) Jurisdictions that do not have household hazardous waste days and used oil disposal programs be encouraged to start these programs.

(e) Hazardous waste days similar to the programs for household chemicals be established to provide farmers with the opportunity to dispose of leftover lots of pesticides and other toxics substances.

OBJECTIVE

The principal objective of the Toxics of Concern List (TOCL) is to identify and provide concise documentation on key toxic substances either adversely impacting the Bay system or for which the reasonable potential to do so exists. This list will provide Chesapeake Bay resource managers and regulators with the information needed to target these toxic substances for additional research, monitoring and assessment. The TOCL may also be used to strengthen existing or to establish new regulatory control and prevention actions. Potential management uses of the TOCL include non-point source control targeting (agriculture, urban, stormwater); point source permits and

regulations; restriction on banning of products; criteria development and standards promulgation; and decisions to require monitoring or assessment of specific sources.

All managers involved with environmental decision-making related to toxic substances are faced with the task of compiling and assessing a wide diversity of scientific and technical information in order to deal effectively with toxic issues. The TOCL provides a Baywide consensus of priority toxic substances. The comprehensive compilation of toxic substance information associated with the TOCL in the consistent format necessary to establish priorities will assist responsible agencies in addressing regional and Baywide toxicant-specific problems. The States will be able to use the list to target development of water quality criteria and promulgation of standards, where applicable, consistent with the commitments contained within the Basinwide Toxics Reduction Strategy.

INTRODUCTION

The Criteria and Standards Work Group was created in October 1989 to accomplish the task of implementing the following commitment from the Chesapeake Bay Toxic Reduction Strategy.

"The Signatories commit to develop and update a Chesapeake Bay Toxics of Concern list, maintain a matrix of supporting information, and utilize the list and the supporting matrix to establish priorities for future standards adoption, monitoring, assessment, research, and toxic reduction actions as described within this Strategy."

In developing the Toxics of Concern List (TOCL), the Work Group had to assess the extent and pertinence of the information available. The formidability of this task quickly became apparent as the Work Group, together with the Chesapeake Bay Liaison Office (CBLO) staff, struggled with data collection and evaluation. Information available from federal, state and research institutions varies from the extremes of raw field measurements to unpublished and published reports. Generally, for the purposes of developing the TOCL, the necessary supporting information concerning the quality control/quality assurance procedures associated with most data was lacking. Many measurements were reported without detection levels, as estimates, or with insufficient documentation to determine their validity. The experience of the Work Group in developing the first TOCL illustrates the overwhelming need for coordination of research objectives, data collection and comprehensive analyses in order to accurately assess the Bay's toxicity problems. This need includes the provision of appropriate quality control/quality assurance procedures to ensure that the sample collection and analyses are valid and that the raw data collected for any project funded by any signatory of the Bay Agreement is submitted in an appropriate format for the data's immediate inclusion in the Chesapeake Bay Program Computer Center.

The disparity and lack of cohesiveness in the data base search made quantitative and qualitative assessment of toxic impact difficult on a baywide basis. Cognizant of this problem, the Work Group grappled with the need to validate the perception of impact associated with certain toxic substances. The available information in many cases was strongly suggestive of potential or actual impact but not definitely conclusive. This finding is reflected in many of the Work Group's recommendations which call for additional monitoring and impact assessment prior to water quality criteria development and adoption of additional regulatory controls.

Some substances, such as chlordane and PCBs, were included in the Toxics of Concerns List although usage is banned or severely restricted. Although it may appear at first glance that no further regulatory controls are needed, some of these substances continue to have an impact and are addressed through fish advisories or discovery of potential "hot spots". The relative importance of continuing non-point source (NPS) contribution of the substances needs to be documented and evaluated to determine whether NPS controls are needed and what technologies are available.

Some toxic substances which have been associated with localized impacts in the Bay watershed do not appear on the TOCL. Their absence in no way diminishes their importance in a specific situation or locality. For example, Kepone contamination in the Bay watershed is confined to the James River. The TOCL addresses the broad watershed perspective of the Chesapeake Bay and attempts to identify toxic substances, the impacts, of which have ramifications across jurisdictional boundaries and throughout the fresh, estuarine and salt water environments.

APPROACH

To accomplish its task, the Work Group developed a Work Plan which detailed the process to be followed in developing the Toxics of Concern List (TOCL). The full Work Plan is attached to this report as Appendix A. The main components of the Work Plan are:

- * Solicit public comment and input to the draft Work Plan;
- * Identify the toxic substances discharged to the Chesapeake Bay watershed;
- * Develop a computerized information matrix for all toxic substances that may enter the Bay watershed;
- * Develop and apply a numerical ranking system to assist in prioritizing the relative importance of toxic substances discharged into the Bay watershed;
- * Verify that the substances on the draft TOCL cause or have reasonable potential to cause an adverse impact on natural resources or human health in the Bay watershed;
- * Identify the need for water quality criteria development for the TOCL and the need to generate additional information as necessary;
- * Recommend to the Toxics Subcommittee specific actions for the regulation, management, control or prevention of discharge for each toxic of concern;
- * Present the final TOCL to the Implementation Committee for final approval and adoption; and
- * Update the TOCL on a biennial basis using the procedure outlined in the Work Plan.

The Chesapeake Bay Basinwide Toxics Reduction Strategy required the Signatories to the Bay Agreement to hold a public meeting to invite input from the public on the Work Plan for developing the TOCL. This meeting was held on December 19, 1989 in Washington, D.C. under the sponsorship of the Chesapeake Bay Program's Citizen Advisory Committee.

Because most of the information sources and data compilations identified in the Work Plan are in their embryonic stages, the Work Group was forced to compensate for data inadequacies. Specifically, the Work Group modified its adherence to the Work Plan as follows:

- 1) Chesapeake Bay Basin Comprehensive List of Toxic Substances - Since this list is constantly evolving as the Toxics Loading Inventory and ambient concentrations database expand, the Work Group used the listing of 360 substances available as of January 30, 1990.

2) Ranking System - The Work Plan presents a ranking system to prioritize the relative importance of the toxic substances in an objective, uniform manner. Unfortunately, the data base to support the ranking system is just beginning to be developed. Data available in a usable and accessible form was limited to the 1989 SARA Title III listing of chemicals. After considerable discussion, the Work Group elected to edit the SARA listing to include only those chemicals identified as discharged in the Chesapeake Bay watershed. This Bay subset of 166 substances was ordered, by priority, using the ranking system.

3) Chesapeake Bay Verification - The Work Group selected the top 10% (17 substances) of the 166 ranked Bay toxic substances listing for closer examination. This examination was focused to verify that these substances were currently being directly discharged to surface waters of the Bay watershed, to identify known sources and, where possible, the quantities discharged and their impacts. This process identified a myriad of inadequacies in the available information systems and data bases. It also highlighted the need for adequate support staff for this Work Group to function.

Completion of this exercise left the Work Group dissatisfied with the results. The Work Group elected to augment its activities through a more informal process. Work Group members were given two weeks to solicit from their respective organization(s) a listing of those toxic substances believed important in the Bay watershed. The lists were cross-matched with the draft list developed through the Work Plan. From this process a list of fourteen primary substances and ten potential candidate substances emerged.

The Work Group then turned its attention to refining and verifying this list. An information sheet was developed for each of the fourteen substances to be included in the Toxics of Concern List. The information sheet summarizes relevant information concerning human health effects, aquatic life effects, usage, environmental fate and persistence, known criteria or standards, known concentrations in the Bay watershed, research and management recommendations and information sources. The information sheets (Appendix B) represent the first level of the matrix of supporting information required under the Chesapeake Bay Basinwide Toxic Reduction Strategy commitment.

The Work Group also identified a secondary group of toxic substances which, pending review, may ultimately be considered for inclusion in future Toxics of Concern Lists. This list includes:

Alachlor	Fenvalerate
Aldrin	Metolachlor
Arsenic	Permethrin
Dieldrin	Toxaphene
Diiflubenzuron (dimilin)	Zinc

4) Recommendation - The information sheet developed for each substance included in the TOCL contains specific recommendations for further investigation or future management of the substance. Recommendations to assist with the gathering of additional information and the further review of the toxic substances identified as potential candidates for the TOCL are included in Appendix C.

5) TOCL Revisions - Future revisions of the Toxics of Concern List will incorporate the latest available information on point and non-point source loadings, ambient concentrations, aquatic toxicity characteristics, and federal and state regulations or restrictions. The Strategy requires the Toxics of Concern List to be reviewed and revised as necessary every two years after the initial list is developed, either adding or deleting toxic substances as appropriate. Since the Work Plan could not be fully implemented by the Work Group because various key components remain incomplete, the Work Group plans to complete a revision of the list within one year. This more complete demonstration that the process can work will provide the foundation for the biennial updates required.

FUTURE DIRECTION

This report, which presents the initial Chesapeake Bay Toxics of Concern List and supporting matrix of information, meets the Basinwide Toxics Reduction Strategy Commitment for the creation of a Toxics of Concern List. The Work Group plans to update the Toxics of Concern List within one year of this initial list's publication. This immediate revision exceeds the biennial requirement stated in the Toxics Reduction Strategy. The Work Group felt this was necessary in order to consider the latest data available and to formalize the process used to rank and select the toxic substances for the Toxics of Concern List.

Simultaneously, the Work Group will investigate current EPA commitments for criteria development for any or all of these substances. The Work Group will also explore mechanisms available for potential criteria development among the signatories to the Bay Program and will report its findings to the Subcommittee.

CHESAPEAKE BAY PROGRAM
Toxics Subcommittee's and Living Resources Subcommittee's
Joint Criteria and Standards Work Group

CHESAPEAKE BAY TOXICS OF CONCERN WORKPLAN

Introduction

On January 5, 1989, the signatories of the 1987 Chesapeake Bay Agreement adopted the Basinwide Toxics Reduction Strategy. This strategy was designed to fulfill the Water Quality Commitment Number 3 of the 1987 Chesapeake Bay Agreement:

"By December 1988, to develop, adopt and begin implementation of a basinwide strategy to achieve a reduction of toxics consistent with the Water Quality Act of 1987 which will ensure protection of human health and living resources. The strategy will cover both point and nonpoint sources, monitoring protocols, enforcement of pretreatment regulations and methods for dealing with in-place toxic sediments where necessary."

The Strategy has stated as its goal:

"To work towards a toxics free Bay by eliminating the discharge of toxic substances from all controllable sources. By the year 2000 the input of toxic substances from all controllable sources to the Chesapeake Bay will be reduced to levels that result in no toxic or bioaccumulative impacts on the living resources that inhabit the Bay or on human health."

In order to achieve this goal, the Strategy identified as one of its major commitments: the "creation of a Chesapeake Bay Toxics of Concern List that will provide a basis for assessing and then controlling substances that are toxic to the Bay or human health".

The signatories committed "to develop and update a Chesapeake Bay Toxics of Concern List, maintain a matrix of supporting information, and utilize the list and supporting matrix to establish priorities for future standards adoption, monitoring, assessment, research, and toxic reduction actions", as described within the Strategy. Following are the specified signatories' commitments and dates of completion:

By September 1989, the signatories commit to hold a joint public meeting to invite input from the public on a workplan for developing the Toxics of Concern list. The Water Quality Task Group will use this information in developing the workplan and the initial list.

By December 1989, the signatories commit to complete a workplan describing the specific selection criteria for toxics to be incorporated into the list; how toxics of Baywide concern will be addressed; description of the supporting matrix elements and corresponding sources of information; plans for surveying existing source and monitoring data to develop the inventory of toxics from which the list will be developed; description of the applications and timetable for using the list; the schedule for future updates of the list and supporting matrix elements and methods for including public involvement in the process.

By March 1990, an initial Toxics of Concern List will be developed for use by the Chesapeake Bay Program.

Every two years, the Toxics of Concern List will be reviewed and revised as necessary when monitoring programs and research studies identify other compounds meeting the selection criteria. A revised and updated Toxics of Concern List will be completed by March of each successive two year period after the initial list is developed.

The Chesapeake Bay Program Toxics Subcommittee will assume the lead responsibility in executing the commitments stated above. The actions and decisions of the Toxics Subcommittee will be subject to review and approval by the Implementation Committee. The participation of the Chesapeake Bay Program committees and the general public will be solicited by the Toxics Subcommittee in the development and review of the Toxics of Concern List.

Objective

The principal objective of the Toxics of Concern List and matrix is to identify and provide concise documentation on key toxic substances either adversely impacting the Bay system or with the potential to do so. This list will provide Chesapeake Bay resource managers and regulators with the information needed to target these toxic substances for additional research, monitoring and assessment, and to strengthen existing or establish new regulatory control and prevention actions. Intended management uses of the Toxics of Concern List include : nonpoint source control targeting (agriculture, urban, stormwater); point source permits and regulations; restriction/banning products; criteria development and standards promulgation; and decisions to require monitoring/assessment of specific sources.

All managers involved with environmental decision making related to toxic substances are faced with the task of synthesizing and assessing a wide diversity of scientific and technical information in order to deal effectively with toxic issues. The Toxics of Concern List and its supporting risk assessment of the Bay watershed will provide a Baywide consensus of priority toxics and a

comprehensive compilation of toxic substance information in the consistent format necessary to establish priorities for the responsible agencies to address regional and Baywide toxicant specific problems. The states will be able to use the list to target promulgation of water quality criteria and standards, where applicable, consistent with the commitments contained within the Basinwide Toxics Reduction Strategy.

Approach

The Chesapeake Bay Basin Toxics Data Base will list those toxic substances presently impacting or having the potential to impact the Bay system. This inventory of toxic substances will be prioritized based on a set of ranking criteria. Toxic substances high in this ranking will be subjected to an intensive investigation to identify their impact on the Bay. This investigation will target sources, document identified impacts and provide information concerning available regulatory controls. From this process will emerge the priority listing for toxic substances, i.e. the toxics of concern list. All information for each of Bay toxics of concern will be summarized in an accompanying information matrix.

There will be a continual feedback loop between the Toxics Data Base, the Toxics Loading Inventory and the Toxics of Concern List. As the Toxics Data Base incorporates other media, additional toxic substances will be identified for possible inclusion in the Toxics of Concern List. Additional toxic substances identified through monitoring of nonpoint and point sources will be incorporated into the Toxics Loading Inventory, a component of the Toxics Data Base, for quantification of loads to the Bay basin.

Work Plan

Outlined below is a sequential listing and description of the steps to be taken to meet the Basinwide Toxics Reduction Strategy commitments to develop and update a Chesapeake Bay Toxics of Concern List.

STEP I: Public Meeting for Review of the Workplan

After preliminary approval by the Toxics Subcommittee, the Toxics of Concern workplan will be presented at a public meeting sponsored by the Chesapeake Bay Program's Citizens Advisory Committee for review and comment. (This step was completed December 19, 1989.)

STEP II: Toxics Loading Inventory

Toxic substances for which nonpoint or point sources can be identified and quantitated (e.g. volume, flow, concentration, pounds per day, pound per acre applied) will be included in the basinwide Toxics Loading Inventory. This data will be one component of the Toxics Data Base.

STEP III: Identification of Toxics Substances in the Chesapeake Bay

There are literally thousands of toxic substances which could be considered for inclusion in the Chesapeake Bay Basin Toxics Data Base. The first step is to compile an initial list of the "total population" of toxic substances that have been found within or have the potential for entering the Chesapeake Bay system. Toxic substances will be identified from any one or combination of the following sources of information or data:

- * Ambient water quality data (including microlayer, surface water, water column, and groundwater studies).
- * Sediment quality data (including interstitial water).
- * Finfish and shellfish tissue body burden data.
- * Air quality monitoring data including atmospheric deposition studies.
- * NPDES permit applications and self-monitoring reports for point source dischargers within the Bay basin (including exceedences or violations of allowances for NPDES or Pretreatment permits).
- * National Urban Runoff Program data and other available information on urban nonpoint sources.
- * Public water supply source monitoring data.
- * The Chesapeake Bay Pesticide Use Survey and other records of pesticide and herbicide inventories/usage.
- * States' 304(1) lists and data sources listed in EPA's final guidance to states for developing their 304(1) lists.
- * SARA Title III data.
- * Special surveys, studies or reports from various sources including other federal and state agencies, the research community and Bay public interest groups.
- * Recommendations by expert Bay region researchers.

For each toxic substance appearing on this initial list, the reference source(s) of its listing will be documented. Criteria will be established for adding/deleting substances to/from this comprehensive list of Chesapeake Bay toxic substances.

STEP IV: Selection Criteria and Data Collection

The first step in determining what toxic substances should be targeted for necessary action is to rank the toxic substances in relative importance. A series of selection criteria, each assigned a ranking factor, is needed to screen the initial available data for the comprehensive list of toxic substances resulting from Step III. Priority will be given to data generated in the Chesapeake Bay watershed.

After reviewing several ranking systems currently in use, the new ranking system developed by Battelle for the EPA Office of Water was selected. This ranking system may be modified in the future to accommodate additional ranking categories important to the Chesapeake Bay. Full details of the ranking system are available in "Implementation of a Chemical Ranking System", Battelle, December 1989, EPA Contract No. 68-03-3534, Work Assignment H1-B2, Task 3.

The final selection criteria currently includes:

TOXICS EFFECTS DATA

Acute aquatic toxicity
Chronic aquatic toxicity
Acute wildlife toxicity
Acute mammalian toxicity
Chronic/subchronic mammalian/human health toxicity
Mammalian/human health carcinogenicity

ENVIRONMENTAL FATE DATA

Bioconcentration/bioaccumulation
Environmental persistence
Environmental partitioning (percent in water, suspended solids, aquatic biota and sediments)

CHEMICAL EXPOSURE DATA

Production volume
Discharge amount to water
Discharge facilities
Mean concentration in ambient water
Mean concentration in aquatic sediments
Treatability (percent removal from WHERL Organics Treatability Data Base)

The ranking system may be revised to include additional factors such as:

- o high toxicity to important Bay organisms with particular emphasis on those target species identified by the Chesapeake Bay Program;
- o chronic wildlife effects;
- o high measured microlayer concentrations;
- o atmospheric deposition;
- o human body burden; and,
- o other factors as need becomes apparent.

The ranking for each toxic substance will be periodically updated as new information becomes available. Each time any information for a specific toxic substance is revised or updated in the ranking system, the date of update will be documented.

Plans for development of a similar ranking system for the compilation of the Chesapeake Bay Pesticide Registry will be integrated into this ranking system.

STEP V: Application of Ranking System

Using the ranking system, the toxic substances listed in the Toxics Data Base will be screened to produce a preliminary list. The screening process will assign a numerical value for those selection criteria where information is available. Decisions as to whether to include the individually ranked toxic substance for further consideration will be based on a numerical cutoff (e.g. all toxic substances with a score greater than 40) or on an arbitrary cutoff within the overall ranking system (e.g. the top 10% ranked toxic substances).

STEP VI: Chesapeake Bay Data Verification

Initially, an assessment of the risk to the Chesapeake Bay system posed by the highest ranked toxic substances will be made. Eventually, this assessment will be extended to all toxics substances identified in the Chesapeake Bay Basin Toxics Data Base. An Information Matrix will be developed to provide a comprehensive compilation, in a consistent format, of the latest information on the given toxic substance. The risk assessment for each top ranked toxic substance's actual impact on or potential to impact the Chesapeake Bay system will be performed based on information contained within the Matrix.

In addition to the STEP IV Selection Criteria data, the following informational categories are proposed for inclusion in the Matrix:

- 1) Sources of toxic substances including:
 - a) point sources (municipal and type of industrial effluent; SIC code),
 - b) nonpoint sources (agricultural runoff, urban runoff, and groundwater seeps, marina/boating activities),
 - c) combined sewer overflow,
 - d) spills in transportation or production and processing.
- 2) Known or suspected characteristics and sinks for toxic substances, to include information on the effects of the various toxic substances in sediment, water column, and on biota and whether the toxic substance is expected to be found in the surface microlayer, fish and shellfish tissue via bioaccumulation/biomagnification/bio-activation, and its geographic distribution throughout the Bay.
- 3) The relative range of and average concentrations of the toxic substances in receiving waters, sediments, and fish and shellfish tissue based on existing, available data.
- 4) FDA action levels, cancer reference doses and carcinogenic potency factors for human consumption of finfish and shellfish.
- 5) The regulatory status, indicating the reference source listing(s) of each toxic substance.
- 6) Availability of water, sediment, and tissue analytical methods relative to the Chesapeake Bay system and their respective detection levels.
- 7) Established criteria, guidelines, standards and regulatory action levels for drinking water, ambient water, and sediment for protection of human health and aquatic life.
- 8) Interim guidelines as appropriate for sediment quality such as, screening level concentrations and apparent effects thresholds.

Upon completion of the risk assessment, the Criteria and Standards Workgroup will identify the Toxics of Concern List. This list will be forwarded to the Toxics Subcommittee for its approval.

The Matrix will also be an information reference on the toxics of concern when decisions are made on targeting the individual toxic substances for followup research, monitoring, and management actions. The toxic substances will be organized according to their common name and Chemical Abstracts Service (CAS) Registry Number. The Matrix will contain a date of update for each toxic substance revision in order to document when all revisions are made.

STEP VII. Peer Review of Toxics of Concern Ranking/Risk Assessment

The Toxics Subcommittee will seek peer review of the documented results from the ranking and risk assessments performed up through and including STEP VI.

STEP VIII. Approach for Identifying Followup Actions

Following the approval of the preliminary Toxics of Concern List, the Criteria and Standards Workgroup will produce a document outlining an approach for identifying control, corrective and preventative actions and present it to the Toxics Subcommittee for further action.

STEP IX: Water Quality Criteria Development/Data Base Needs Identification

In the absence of existing water quality criteria for the listed Toxics of Concern, and if sufficient information is not available for establishment of criteria by the states, the Toxics Subcommittee will request the EPA Criteria and Standards Division place priority on the development of national water quality criteria for these toxic substances.

For those toxic substances for which the existing toxicity data base information is not adequate for water quality criteria development, the joint Toxics Subcommittee/Living Resource Subcommittee Criteria and Standards Workgroup will list, in priority order, the Chesapeake Bay species specific toxicity test results that are required to fill in the data gaps. This listing will be circulated to state and federal agencies by the Toxics Subcommittee with a request to support necessary research to address the data base gaps. The Toxics Subcommittee will also request the Scientific and Technical Advisory Committee consider these research needs when developing its annual Chesapeake Bay research priorities list.

STEP X: Identifying Control, Corrective and Prevention Actions

Based on the review of the information contained in the risk assessment described above and after inviting comments from other Chesapeake Bay Program Committees, the Toxics Subcommittee will recommend to the Implementation Committee specific regulatory, management control or preventative actions for each toxic of concern. For those toxic substances where there is insufficient information available to recommend control actions, specific assessment actions will be identified. These actions, with time schedules for implementation, could include:

- * Adoption of water quality standards/criteria as a basis for enforceable control requirements for nonpoint and point sources.
- * Adoption of control policies or guidelines in lieu of enforceable standards for point and nonpoint sources.
- * Recommendations for new or revised best management practices for nonpoint sources.
- * Recommendations for improved pretreatment programs/NPDES permits to address specific toxic substances.
- * Recommendations for additional research, particularly for nonpoint sources.
- * Recommendations for additional monitoring or special surveys.
- * Recommendation for restrictions on the use designation and/or application of a product (i.e. agricultural or industrial).
- * Recommendations for product restrictions and bans.
- * Public information/public education programs.
- * Determination that a toxic substance is not currently adversely impacting the Bay system, that no corrective actions are necessary, but the potential for future impact is significant enough to warrant preventative actions.

A specific recommendation for action is anticipated for each toxic substance included on the final Toxics of Concern List. The recommended corrective actions become major Chesapeake Bay Program agency restoration and regulatory activities in regards to toxic substances.

STEP XI: Process for future revisions and updates

The final Toxics of Concern List and the supporting Matrix will be revised and updated by March of each successive two year period after the initial list is developed, as called for in the Basinwide Toxics Reduction Strategy. The Criteria and Standards Workgroup will develop the process for updating this list to address the completion of data gaps, and the incorporation of additional/revised data.

STEP XII: Chesapeake Bay Program Approval

A document will be produced listing the Toxics of Concern list, the supporting informational matrix, recommended corrective and preventative actions, and a description of the proposed process for future updates. A description of the process followed to develop the initial Chesapeake Bay Toxics of Concern List will also be outlined in the document. This document will be presented to the Implementation Committee for final review, approval and adoption.

APPENDIX C

Recommendations to assist with the gathering of additional information and the further review of the toxic substances identified as potential candidates for the Toxics of Concern List.

The candidate substances are:

Alachlor	Fenvalerate
Aldrin	Metolachlor
Arsenic	Permethrin
Dieldrin	Toxaphene
Diflubenzuron (dimilin)	Zinc

For the substances listed above:

- o Fund acute and chronic aquatic toxicity studies for Chesapeake Bay basin species (fresh, estuarine, salt waters) with emphasis on estuarine and salt water species if monitoring demonstrates concentrations in the ambient water column are sufficient to warrant investigation of potential toxicity impacts and the development of water quality criteria.
- o Research the relative contributions of various sources, particularly nonpoint sources, of arsenic and zinc to the Bay watershed; target the contribution from treated wood in the arsenic investigation.
- o Sponsor a literature search to document the persistence and toxicity of alachlor, fenvalerate, metolachlor, and permethrin.
- o Determine if either extensive or limited monitoring in the water column is needed for alachlor, aldrin, dieldrin, dimilin, fenvalerate, metolachlor, permethrin, and toxaphene. Based on the results of the literature search, the current pesticide usage data available for the Chesapeake Bay watershed and the current Bay watershed monitoring data, Monitoring should be timed to periods of highest pesticide application and should include reasonable time periods after application to determine persistence.



Chesapeake Bay toxics
of concern list
basinwide toxics
EJDD CB 00444