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UNIVERSITY AT BUFFALO  
STATE UNIVERSITY OF NEW YORK

May 9, 1989

Great Lakes Program  
207 Jarvis Hall  
Buffalo, New York 14260  
(716) 636-2088

Mr. Phillip Weller, Executive Director  
Great Lakes United  
Cassety Hall, SUNY College  
1300 Elmwood Ave.  
Buffalo, NY 14222

Ralph R. Rumer  
Director  
R. Warren Flint  
Associate Director

Dear Phil,

As we discussed recently, I would like to involve Great Lakes United in an initiative that we have started at the Great Lakes Program of SUNY at Buffalo on toxic chemical exposure effects to humans. This project has developed a great deal of momentum following our April 1989 Disciplinary Workshop, and we are attracting considerable interest throughout both Canada and the U.S. regarding future planned activities. As an example, I have been asked to make a presentation to the International Joint Commission's Scientific Advisory Board at their May meeting in Buffalo on our progress.

I have enclosed a project description that both indicates what has been accomplished so far regarding the program goals and what we are planning with regards to an International Working Conference and a Public Participation Conference. Please note that we are also planning a tele-conferencing process for April 1990 that will disseminate the conclusions and recommendations from this effort to the entire Great Lakes basin community.

I would like to propose that your group, along with the Center for the Great Lakes, plan on participating with us in the summarization of products that are derived from both the April 1989 Disciplinary Workshop and the October 1989 International Working Conference in a less technical format for public review. In addition, I would like to propose that we collaborate on the conduct of PUBLIC PARTICIPATION CONFERENCE on this subject in December 1989 that will provide the forum for public involvement in the process defined by the enclosed project description.

For your information, I am making a similar proposal to Madelyn Webb of the Center for the Great Lakes. I hope that we can cooperate on this very important effort so that the Great Lakes basin public is afforded both the opportunity for participation as well as the benefit of integrated knowledge on the issue of toxic chemical contamination in the Great Lakes and potential risk from this contamination to humans.

I look forward to hearing from you soon so that we can begin to incorporate your group in our planning strategy.

Sincerely,

R. Warren Flint  
Associate Director

RWF1.5/WELLER.1tr

Enclosure

## EVALUATING RISKS TO HUMAN HEALTH ASSOCIATED WITH EXPOSURE TO TOXIC CHEMICALS IN THE GREAT LAKES BASIN ECOSYSTEM

### INTRODUCTION:

The problem of toxic chemicals and human health in the Great Lakes Basin ecosystem can be and has been approached from many different disciplinary perspectives. Although such a fragmented approach is amenable to understanding certain discrete aspects of the problem, it does not provide the integrated view required for problem identification and resolution. In addition, there is significant disagreement among scientists and among governments regarding actual human health risk associated with exposure to toxic chemicals in the Great Lakes. This disagreement leads to uncertainty in the public regarding their risk to living in the Great Lakes Basin. Our need therefore, is to develop a consensus by governments and scientists on the status of our knowledge and and to determine whether or not there are toxic chemical effects to human health in the Great Lakes Basin ecosystem.

### NEED:

A study in 1985 by the Royal Society of Canada and the United States National Research Council found "substantial evidence that the human population living in the Great Lakes basin is exposed to and accumulates appreciably more toxic chemical burden than people in other large regions of North America for which data are available". A pioneering 1984 study by Wayne State University researchers found that infants born to women who ate Lake Michigan fish contaminated with toxic polychlorinated biphenyls (PCBs) had developed mental abnormalities. A similar study by the University of Wisconsin in 1984, in Sheboygan, found that exposure to high PCB levels in the womb produced infants suffering more from colds, earaches and the flu, but indicated no lasting effects. To evaluate toxic chemical sources a market-based study in Toronto found that many fish were tainted with toxic chemicals such as pesticides. This study concluded in 1985 that 86% of the toxic chemicals in consumers bodies came from food.

Is the correlation of environmental abnormalities in fish and wildlife with the presence of toxic contaminants a signal that the health of the Great Lakes and society are jeopardized? This concerns regulatory agencies that do not want the public exposed to a health hazard but at the same time want to promote the benefits of valuable Great Lakes resources. We require more than just signals, however. We need a better understanding of what the specific issues are and what measures should be the focus of new data collection. The public needs reliable information to make judgments about utilizing and consuming resources from the Great Lakes. Governments need to integrate the various components of the toxic chemical issue and evaluate effects on ecosystems and humans. Uncertainty needs to be reduced in order to improve the public's confidence in governmental policy making. It is both inappropriate and costly to place the burden of proof of harm from conceivably toxic chemicals on the general public, which is the exposed population. The scientific community must provide information and analysis, and then work with government to assure the safety of the public and proceed to remedy the pollution. THIS IS THE INTENT OF THIS PROJECT.

SOLUTION:

Our knowledge on the topic of human health risks associated with exposure to toxic chemicals in the Great Lakes basin is extremely fragmented and incomplete. Thus, the reason for the effort we have embarked upon. Presently we do not have a consensus by governments or scientists on how, or if, toxic chemicals in the Great Lakes ecosystem may be affecting human health. There is a need to document what is known and identify what is unknown about exposure to the different chemicals. We also need to determine the biological, psychological, and sociological effects of potential exposure to chemicals. Although there are no easy answers, we must acknowledge that the world is not going to wait for a perfect state of our knowledge on the issue of toxic chemicals and human health.

A number of initiatives possessing merit have been developed targeting specific components of the toxics and human health issue in the last two years (e.g., an IJC Workshop on The Role of Epidemiology in Assessing the Effects of Great Lakes Water Quality on Human Health, March 1988; a US NIEHS Conference on Chemically Contaminated Aquatic Food Resources and Human Cancer Risk, September 1988; Great Lakes Coalition of Public Health Associations Conference, The Great Lakes Basin: A Regional Focus on the Environment and Human Health, October 1988; a US EPA Symposium on In Situ Evaluation of Biological Hazards of Environmental Pollutants, November 1988; an IJC Workshop on Cause and Effect Linkages for Toxic Chemicals in the Great Lakes, March 1989; an IJC Workshop on Research Strategies to Appraise Adverse Human Health Effects from Exposure to Hazardous Substances in the Great Lakes Basin Ecosystem, March 1989). Although these efforts provide significant insight to the problem of environmental contamination with toxic chemicals, they have operated in isolation from one another, not allowing a holistic perspective on the problem to be developed.

There are many who now believe it is time to address the breadth of the problem of toxic chemicals in the Great Lakes Basin so that we can certify whether or not there is indeed a public health concern for society. By addressing the entirety of the topic all available knowledge can be assembled and evaluated and all existing tools and methodologies for potential new data needs can be assessed and critiqued. Clearly, an interdisciplinary approach is essential to construct a comprehensive definition of the problem as well as to seek viable solutions.

The Great Lakes Program at the State University of New York (SUNY) at Buffalo, in collaboration with the Behavior & Social Aspects of Health Center and the Toxicology Research Center, both of SUNY at Buffalo, are conducting a project focused upon the broad topic of Great Lakes toxic contaminants and human health effects. The overall goal of this project is to define whether a problem(s) exists and if so to identify its extent, and to seek practical solutions. This project is being carried out with collaboration from the New York Great Lakes Research Consortium (Syracuse, NY), Health and Welfare Canada (Ottawa, Ontario), Environment Canada (Toronto, Ontario), and the Department of Fisheries and Oceans Canada (Burlington, Ontario).

To address the project goal in a comprehensive fashion, a three-pronged approach has been developed: a disciplinary workshop, which has already been completed; an international working conference to achieve cross-discipline objectives, for which funding is requested here; and activities that will

effectively disseminate results of the project, both to the various jurisdictions and the public. The objectives of this initiative are the following:

- o To provide a forum for promotion of a more holistic, cross-disciplinary approach to the assessment and reduction of risk to human health from toxic chemicals.
- o To collect all relevant data on this topic and integrate this data into a comprehensive assessment of our present knowledge.
- o To attempt to remove uncertainty and clarify effects based upon our existing knowledge.
- o To identify information gaps.
- o To provide a comprehensive scientific overview of available data to governments so that they can make more informed decisions regarding policy for reduction of risks to human health from exposure to toxic chemicals.
- o To make recommendations on an achievable research strategy that addresses information gaps and seeks practical solutions.
- o To inform the public on whether there are, or are not, human health effects from chemicals in the Great Lakes basin, based upon best available information.

#### PROJECT DESCRIPTION:

Experts in sociology, anthropology, environmental risk assessment, toxicology, physiology, chemistry, environmental science, epidemiology, psychology, medicine, modeling, environmental law, economics, public health, and environmental regulation have been involved in this project since its initiation in August 1988. These experts have been asked to consider the following:

- (1) *Do toxic contaminant levels in the Great Lakes Basin pose a risk to humans?*
- (2) *What are the indicators of risk to human health?*
- (3) *What valid reasons are there for being concerned about this exposure?*

Through this project these specialists are being subjected to the process of discipline-oriented workshop discussions and to a dynamic cross-disciplinary working conference that will provide data interpretations, conclusions and recommendations addressing the objectives stated above. The actual time-line for activities associated with this project are depicted in Table 1.

TABLE 1. Activities for Toxic Chemical-Human Health Effects Project.

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<u>EVALUATING RISKS TO HUMAN HEALTH ASSOCIATED WITH EXPOSURE TO TOXIC CHEMICALS IN THE GREAT LAKES BASIN ECOSYSTEM</u>	
<u>PROJECT TIME-LINE</u>	
AUGUST 1988	PROJECT INITIATION - seeking of interested participants and development of Steering Committee.
OCT. - NOV. 1988	STEERING COMMITTEE MEETINGS - identity of project goals, devising strategy, and specific planning for the April Disciplinary Workshop.
APRIL 15-18, 1989	DISCIPLINARY WORKSHOP - eight discipline groups meet to identify issues, gaps, and recommendations and produce discipline summary documents.
MAY 31, 1989	DISCIPLINARY WORKSHOP SUMMARY DOCUMENTS DUE
JUNE 9, 1989	INITIAL PLANNING FOR WORKING CONFERENCE - coordinating committee & discipline group facilitators will identify tasks and define issues for 1989 International Working Conference.
JUNE - AUGUST 1989	COORDINATING COMMITTEE WORK FOR INTERNATIONAL CONFERENCE - integration of materials for pre-conference briefing book, planning of conference, and identification of delegates. <u>(Involvement of special interest groups will occur here to prepare for the public participation component of the project)</u>
SEPTEMBER 1989	PUBLICATION OF BRIEFING BOOK FOR CONFERENCE
OCTOBER 3-6, 1989	INTERNATIONAL WORKING CONFERENCE - to be held in Buffalo, New York.
NOVEMBER 1989	PREPARATION OF CONFERENCE EXECUTIVE SUMMARY - to disseminate conference conclusions & recommendations to governments and the public.
NOV. - DEC. 1989	PREPARATION OF OTHER CONFERENCE PUBLICATIONS
DECEMBER 1989	PUBLIC PARTICIPATION CONFERENCE - intended to allow the public to provide input on the progress of the project and conclusions drawn from International Working Conference.
APRIL 1990	TELECONFERENCING OF INTERNATIONAL CONFERENCE RESULTS & CONCLUSIONS TO ENTIRE GREAT LAKES BASIN

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Although human health is the primary focus here, integration of our knowledge with that of ecosystem health is also recognized as extremely important for our understanding of the effects of toxic chemicals on biological processes. The ecosystem approach in this project will provide a means for considering the spectrum of water quality effects on various aquatic organisms and present a total picture of exposure-health possibilities. From this approach we will have the opportunity to consider indicators of contamination in water, invertebrates, fish, birds, and mammals that are common and could be shared by humans.

#### ACCOMPLISHMENTS TOWARD THE 1989 INTERNATIONAL WORKING CONFERENCE

A Steering Committee was originally established in August 1988 to guide the development of this initiative on toxics and human health in the Great Lakes basin. Early on, this Steering Committee was charged with, 1) the development of a strategy that leads to a 1989 International Working Conference on toxics and human health, 2) the definition of issues surrounding this subject that would serve as the agenda for a disciplinary workshop to prepare briefing materials for this Conference, 3) the identity of experts that would be invited to the disciplinary workshop to present evidence on these issues, and 4) the conduct of activities toward the 1989 Working Conference.

The Steering Committee met at SUNY Buffalo in October and November of 1988 to develop the agenda for a Disciplinary Workshop that was held on April 15-18, 1989. Funding for this April Workshop was provided by SUNY at Buffalo, the New York Great Lakes Research Consortium, Health & Welfare Canada, Department of Fisheries & Oceans Canada, the SANDOZ Corporation, and Environment Canada. The intent of the Workshop was to stimulate discussion within disciplines in order to prepare summaries from each of the discipline work groups regarding the state of their knowledge on the subject of human health risks from exposure to toxic chemicals. Eight discipline groups were identified for this Workshop. These Discipline Groups and their respective group facilitators are listed below.

TOXICOLOGY/ENVIRONMENTAL CHEMISTRY - facilitator: Dr. Jim Olson, SUNY at Buffalo

PSYCHOLOGICAL/SOCIAL/ECONOMIC - facilitators: Drs. Ann McElroy and Adeline Levine, SUNY at Buffalo

PUBLIC HEALTH LAW & POLICY/EDUCATION - facilitators: Dr. Barry Boyer, SUNY at Buffalo and Ms. Beth Jones-Fiore, Wisconsin Dept. Health

BIOLOGICAL SCIENCE (targeting Ecology and Wildlife Toxicology) - facilitator: Dr. Andy Gilman, Health & Welfare, Canada

CLINICAL MEDICINE - facilitator: Dr. Arnold Schecter, SUNY Binghamton

EPIDEMIOLOGY - facilitator: Dr. Jay Van Oostdam, Health & Welfare, Canada

RISK/EXPOSURE ASSESSMENT - facilitator: Dr. James Gillett, Cornell Univ.

NATURE & LOGISTICS OF INTERDISCIPLINARY RESEARCH - facilitators: Dr. Paul Kostyniak and Dr. Jim Blascovich, SUNY at Buffalo

Sixty five (65) scientists gathered for the April Workshop and were divided into the eight discipline groups defined above. The general charge to each Discipline Group was:

- o To collect all relevant data on the topic of toxic chemicals and human health effects for your discipline and integrate this data into a comprehensive assessment of the present state of knowledge for your discipline.
- o To attempt to remove uncertainty and clarify effects based upon your present knowledge.
- o To identify information gaps.
- o To consider achievable research that addresses the discipline's information gaps and seeks practical solutions.

As a product of the Disciplinary Workshop, each workshop group was expected to prepare a clear statement concerning the status of their knowledge on the toxic chemicals/human health issue. These papers are to be used as briefing materials in preparation for the proposed Conference. The following lists the format of the Discipline Group summaries which will comprise the BRIEFING BOOK for the 1989 International Working Conference.

1. OVERVIEW - this is a disciplinary overview pertinent to each group of the workshop, describing what the discipline(s) does, historical involvement in Great Lakes problems and description of basic tools available and approaches taken to environmental/human health problems.
2. IDENTIFY the KNOWLEDGE BASE - develop a menu of the available data specific to each group and to human health effects.
3. CRITICAL INFORMATION NEEDS - targeting the way the discipline group sees the gaps in their knowledge base. This section also addresses the definition of appropriate mechanisms (methodologies & research approaches) to obtain the required new data.
4. HUMAN HEALTH ISSUES - the definition of issues as they relate to toxic chemicals in the Great Lakes Basin ecosystem from the perspective of each work group. To guide each group in these discussions we asked them to assume that there are no human health effects from Great Lakes toxic chemicals. Then they were asked to consider what information from their disciplines they would have to ignore in order to draw the conclusion of no effects.
5. INTERDISCIPLINARY ASPECTS - each workshop group was also asked the following to include in their summary reports:
  - (a) What do you want to know from other disciplines?
  - (b) What do you want to tell other disciplines?
6. BIBLIOGRAPHY - this includes all pertinent information raised during workshop group discussions and compiled in a bibliography format, with keywords for computer searching.

This BRIEFING BOOK includes the Summary for each discipline group from the April Workshop (as described above), as well as Supporting Documents that the group was able to identify during its discussions. These supporting documents include papers that already exist as articles or chapters in a book or

journal, pre-publication reprints, and/or grant proposal background material.

There were a number of questions identified from the April Disciplinary Workshop that will be developed into issues for the 1989 International Working Conference agenda. These are listed in Table 2.

#### CONFERENCE OPERATIONAL PLAN

Success in obtaining the project goals is dependent upon considerable integration between disciplines. Not all the disciplines are similarly developed with respect to the issue of toxic chemicals and human health impacts. Cross-discipline discussions need to occur to guarantee common understanding between all experts. For example, the toxicologist is not just interested in dose-response relationships in animals, but is equally interested in disease outcomes in human populations and how these epidemiology data are used to indicate measures of risk and support the development of policy. Likewise, the epidemiologist would want to consult an anthropologist to identify what populations are the best targets for collecting information.

Therefore, on October 3-6, 1989 a major International Working Conference will be held in Buffalo, New York to address the objectives set by the Steering Committee concerning Great Lakes toxic contaminants and human health effects. Integration between disciplines will be accomplished by this International Working Conference. The intent of the Conference will be to determine what information from the individual disciplines means to comprehensive issues of public policy, research, and education. This conference will provide the forum for accomplishing the above by:

- *synthesizing the information we have right now and relating it to public policy needs,*
- *identifying significant information gaps and developing new interdisciplinary research strategies, and*
- *developing long-term activities towards scientific understanding in support of future public health policy and education.*

A conference of the nature planned here depends upon exquisite logistics for it to be successful and produce the expected outcome. This includes sophisticated technical support and dynamic conference facilitation in order to gain the desired input from the participants. The 1989 International Working Conference will be held at the Hyatt Regency Hotel in downtown Buffalo, New York. Conference facilities at the Hyatt Regency Hotel provide all the expected needs of this proposed gathering including, 24 hour breakout rooms for the working groups, eating facilities and accommodations for all participants, areas to set up on-site secretarial and computer facilities for immediate transcription, and meeting room sizes that meet both the delegate capacity of 60 for the working phase of the Conference as well as an attendee capacity of 200 for the public forum/plenary phase of the Conference.



TABLE 2. List of Discipline Group Issues Identified From April 1989 Workshop.

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- \* In contrast to other regions, how do the Great Lakes compare regarding toxics in the environment?
  - \* What are the fates and persistence of toxic chemicals in the Great Lakes?
  - \* What are the existing barriers that have prevented an ecosystem perspective on toxics and their management?
  - \* What can we learn from toxic impacts observed in fish & wildlife and can these species be used as "early warning devices"?
  - \* What are the general categories of toxics that are of concern in the Great Lakes and what are the relative toxicities of these substances?
  - \* Are there differences between what is measured in the environment (e.g. surrogate species, specific time periods) and what humans are exposed to?
  - \* How important is it to not consider the reality of multiple exposure risk to target populations, and do we possess the methodologies and data bases to do so?
  - \* What effects, if any, result from prolonged ingestion of fish and water containing trace levels of toxic chemicals?
  - \* What are the reproductive and developmental toxicities of halogenated aromatic hydrocarbons in mammalian systems?
  - \* Are there any examples of known injury to human health from Great Lakes toxic contaminants?
  - \* What research methods are available to quantify the different patterns of toxic exposure risk and to "tease out" potential interactive effects from combined chemical insults on human health?
  - \* What methodologies are available to establish exposure concentrations of toxic contaminants to humans and to relate these in a cause-effect fashion to disease outcomes in the exposed populations (e.g., what are appropriate end-points)?
  - \* What are the demographics of populations consuming fish in the Great Lakes?
  - \* How does one identify critical subpopulations subject to effect of toxic exposure under the assumption of no average populations?
  - \* What are the sociologies and perceptions of populations consuming fish in the Great Lakes?
  - \* At times, people care about the environment per se, yet only concern for human health has regulatory status. Should we be willing to overprotect human health in order to protect the environment?
  - \* What are the psychological impacts (e.g. stress & helplessness) on communities exposed to toxic chemicals and how does one compare the level of effect from these impacts to the physical threat from pollution?
  - \* How do we convert reactive interest in toxic chemicals (i.e. NIMBY reaction) into proactive efforts?
  - \* What are the benefits and costs (including "concealed costs") in ignoring the long-term burdens to society for the sake of short-term gains with respect to economic exploitation of resources that may be harmful to human health?
  - \* What are the sacrifices people are willing to make (e.g. willingness to pay) for good environmental quality?
  - \* Are present statutory frameworks reasonable and effective in light of the large data requirements and the impossibility of meeting these requirements?
  - \* Are existing institutional frameworks adequate for development and appropriate interpretation of toxics data for the Great Lakes and for management of biological, physical, and social dimensions of toxics risks?
  - \* Are there differences in interpretation regarding how risk is communicated by regulatory agencies and how risk is perceived by the consumer public?
  - \* How can we do a better job of communicating risk, considering the perceptions of the fish and water consumers (e.g., older publics vs. younger publics and differences in their perceptions of good environmental quality, as well as impact from "folk knowledge"), as well as the "mixed messages" that the public gets from inconsistency in guidelines and regulations?
  - \* How can we do a better job of lessening risk associated with contaminants in the environment, and for future chemicals of concern, how can preventative strategies be put in place that have as a basis a presumption of harm to the environment and humans?
  - \* How can we learn to live with a system in which reduction of risks to even acceptable levels is economically, technically and politically unattainable?
  - \* What implications for risk management are there to considering people (especially local populations) as parts of the impacted ecosystem?
  - \* Contaminants as a human health problem: what is the role of communities and citizen participation in formulating public policy?
  - \* How do we develop a better "layperson" understanding of ecological effects in order to encourage responsible individual behavior and generate political support for legislative action?
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A COORDINATING COMMITTEE has been constituted to provide overall guidance to the process of formulating and conducting this 1989 International Working Conference on the topic of toxics and human health in the Great Lakes Basin. Specific planning, implementation, and follow-up activities related to the Conference will be delegated to a number of subcommittees that are comprised of members of the Coordinating Committee as well as the Disciplinary Workshop group facilitators. A listing of these subcommittees and their tasks is as follows:

1. ISSUES SUBCOMMITTEE: This committee will meet during the summer of 1989 to evaluate the Briefing Book from the April 1989 Disciplinary Workshop and integrate the issues identified by each Discipline Group into a synthesized translation suitable for review by all International Working Conference participants. This committee will consist of Coordinating Committee members and each of the Discipline Group facilitators.
2. PARTICIPANTS SUBCOMMITTEE: This committee will define the participants for the International Working Conference via application for nomination and delegate selection. Drs. Ineke Neutel and Jim Blascovich will head this committee.
3. LOCAL ARRANGEMENTS SUBCOMMITTEE: This committee will plan and arrange for all Conference logistics. Drs. Warren Flint and Paul Kostyniak will head this committee.
4. PUBLICATIONS SUBCOMMITTEE: This committee will synthesize the results of the International Working Conference and incorporate these into publication formats that will include an immediate *Executive Summary*, a *Conference Proceedings*, and *Journal Publication* of selected papers. Dr. John Vena will head this committee.
5. PUBLIC INFORMATION & POLICY SUBCOMMITTEE: This committee will follow through with dissemination of the International Working Conference results and recommendations to the general public and policy makers. The role of this committee might be to continue the conference process via audio-visual teleconferencing that would allow for two-way dialogue between the experts and the publics throughout the Great Lakes Basin on the issues evaluated. Dr. Barry Boyer will head this committee.

The COORDINATING COMMITTEE has developed a list of questions that will be posed to the participants of the International Working Conference to focus their discussions and cause reactions and possible answers that would represent a tangible product to governments and the public regarding the topic of toxic chemicals and human health effects. These questions include the following:

1. *Are there threats to human health from toxic chemicals in the Great Lakes Basin Ecosystem, and if so what are they?*
  - The spectrum of threats are desirable to explore here. Some of them are of a trivial nature while others are of grave concern.
  - Consider the trends of toxic chemical threats; whether things are getting better or worse.

- Discuss the probabilities for changes to occur based upon the trend information.
  - Examine the magnitude of threats to health from chemicals.
2. *If threats are present, to what extent can they be dealt with now and is the existing policy and governance framework adequate to reduce the threats?*
- Existing scientific data should be examined.
  - Discussions should consider this question from a social, political, economic, educational, legal, and regulatory framework.
3. *What additional research is needed?*
- Consider the time horizons for accomplishing (e.g., months, years, decades).
  - Identify the gaps in knowledge that require this research.
  - Detail the priority of research topics.
4. *What policy and/or research actions are proposed, what are the probable costs of these actions, and what are the costs (consequences) of inaction?*

Participation in the Conference will be by delegate selection. Delegates will be chosen from nominations submitted to the Conference Coordinating Committee. These nominations are presently being sought from existing lists of persons who have indicated an interest in this project and the Conference topic, from notices in various societal newsletters, and from announcements in scientific journals such as Science. Approximately 60 delegates with expertise on the various issues of human health and toxic chemical exposure will be invited to attend. Selectees will represent academia, governmental agencies, special interest groups, and legislators. It is expected that chosen delegates will commit to three days of intensive work at the Conference plus a great deal of pre-conference preparation in reviewing the Briefing Book and collecting information they wish to present as evidence for their views at the 1989 International Working Conference.

A preliminary agenda of the International Working Conference to be held from October 3 through October 6, 1989 is listed in Table 3. The working phase of the Conference will be preceded by a Plenary Session that will be open to other scientists, the general public, special interest groups, government agency representatives, and legislators. The intent of this Plenary Session will be to appraise the attendees of the general status of our knowledge on toxic chemicals and human health from the perspective of different disciplines and to inform them of the purpose of the Working Conference that will follow the Plenary Session. This will be the forum where brief presentations will be made by the Group Facilitators from the April 1989 Disciplinary Workshop on their conclusions and recommendations that have been incorporated into the Briefing Book for the International Working Conference. Presently we are also attempting to schedule several keynote addresses for this opening Plenary Session, including Mr. James Bradley, Minister of the Environment for Ontario, Dr. David Axelrod, Commissioner of the Department of Health in New York State, and Mr. William K. Reilly, Administrator of the U.S. Environmental Protection Agency.

TABLE 3. Tentative Agenda for International Working Conference.

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**EVALUATING RISKS TO HUMAN HEALTH ASSOCIATED WITH EXPOSURE TO  
TOXIC CHEMICALS IN THE GREAT LAKES BASIN ECOSYSTEM**

INTERNATIONAL WORKING CONFERENCE

October 3-6, 1989

Hyatt Regency Hotel  
Buffalo, New York

TUESDAY October 3, 1989

1:00 PM OPENING PLENARY SESSION

- Welcome
- Overview and Orientation of Why the Great Lakes has a Problem. Dr. Jack Vallentyne, co-Chair, IJC
- KEYNOTE ADDRESSES
  - Mr. William Reilly, Adm., U.S. EPA
  - Mr. James Bradley, Minister, OME
  - Dr. David Axelrod, Comm. NY Dept. Health
- DISCIPLINE GROUP FACILITATORS REPORTS FROM APRIL WORKSHOP  
(See list of Facilitators above for more detail)

6:00 PM Dinner

7:30 PM TASK GROUP ORGANIZATION MEETINGS

Report on group progress, problems, changes in strategy, etc.

9:30 PM Social

WEDNESDAY October 4, 1989

7:00 AM Breakfast

8:00 AM TASK GROUPS continue discussions

12:00 PM Lunch

1:00 PM Group Facilitator Meeting

1:30 PM FIRST SET OF ISSUE GROUPS MEET

3:30 PM TASK GROUPS Reconvene to continue discussions

6:00 PM Dinner

7:30 PM SECOND SET OF ISSUE GROUPS MEET

9:00 PM Group Facilitator Meeting

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Table 3. Continued

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THURSDAY October 5, 1989

7:00 AM Breakfast  
8:00 AM TASK GROUPS Reconvene to continue discussions  
12:00 PM Lunch  
1:00 PM Group Facilitator Meeting  
1:30 PM THIRD SET OF ISSUE GROUPS MEET  
3:30 PM TASK GROUPS Reconvene to continue discussions  
6:00 PM Dinner  
7:30 PM TASK GROUPS Reconvene to continue discussions  
10:00 PM Group Facilitator Meeting

FRIDAY October 6, 1989

8:00 AM Breakfast  
9:00 AM TASK GROUPS Reconvene to prepare Plenary Session Reports  
11:00 AM Group Facilitator Meeting  
- To make sure that everything is in order for the Plenary  
Session on Friday afternoon  
12:00 PM Lunch  
1:00 PM CLOSING PLENARY SESSION  
- KEYNOTE ADDRESS  
Dr. David Suzuki  
- TASK GROUP FACILITATOR REPORTS  
- ISSUE GROUP REPORTS  
- Delegate discussion and vote on each of the TASK GROUP REPORTS  
6:00 PM Conference Close

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Formal presentations during the actual conduct of the working phase of the Conference will be kept to a minimum. The Briefing Book developed from the April Disciplinary Workshop will provide pre-conference briefing materials to each Conference delegate to assure each participant's being appropriately prepared to discuss, analyze, synthesize, and develop recommendations pertinent to the Conference objectives.

The Conference will be organized in a "matrix" format. Each delegate will be a member of TASK GROUP. Each task group will be comprised of 6-10 conference delegates that represent a mix of disciplines and institutions. There will be six of these Task Groups, as depicted in the matrix diagram in Figure 1. The Task Groups will meet repeatedly throughout the Working Conference to develop recommendations on policy needs, achievable research agenda, and education strategies. These groups will consider the relevant parts of the four questions posed above in their discussions and development of recommendations and hammer out reports that will be considered the major output of the project. These reports will be discussed in detail in the closing plenary session and in the end will be endorsed by the Conference. As an example of focus, these Task Groups will cover such areas as public awareness and new training initiatives under Education, jurisdictional problems and scientific interpretation under Policy, and interdisciplinary investigation and scientific results dissemination under Research.

A second set of groups, the ISSUE GROUPS, will be composed of representatives of each of the Task Groups. These Issue Groups will meet one time only during the Working Conference, for approximately two hours, to deal with a variety of specific issues, 18 in all that require interdisciplinary discussion. Examples of these issues are listed in Table 1 above. It is intended that the Issue Group discussions will serve primarily as input to the Task Groups in order to facilitate their development of recommendations and guidelines.

Figure 1 illustrates the manner in which we intend these two sets of groups to interact during the Conference proceedings. The idea behind this dynamic design is that each member of a Task Group will leave that group at least once during each Conference day and go to a two-hour meeting of a specific Issue Group where all other members of this Issue Group come from different Task Groups. These Issue Group members will never meet with each other again as a group, except during this specific Issue Group session. The result is that there will be a complete mixing of ideas and perspectives on the issues and tasks that are being addressed by this dynamic process and thus, new thoughts will always be "put on the table" of the Task Group from which each of the Issue Group members comes.

A closing Plenary Session will be used to appraise other scientists, the public, governmental representatives, special interest groups, and the press of the preliminary outcome of the Working Conference. During this closing Plenary Session of the Working Conference the major reports of each of the Task Groups, and shorter reports from the Issue Groups, will individually be presented to a session of all delegates for discussion and acceptance, using standard parliamentary procedures, as products from the conference process. These reports will be voted on before the conclusion of the Working Conference to obtain a consensus among the delegates concerning whatever conclusions and recommendations the majority feels they can support.

FIGURE 1. Indication of Matrix Design for Dynamic Interactions During the International Working Conference.

<b>ISSUES GROUPS</b>		<b>TASK GROUPS</b>					
		EDUCATION		POLICY		RESEARCH	
		Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Day 2 1:30 PM	1						
	2						
	3						
	4						
	5						
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Day 2 7:30 PM	7						
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Day 3 1:30 PM	13						
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#### EXPECTED OUTCOME

Several publications are planned from this International Working Conference on EVALUATING RISKS TO HUMAN HEALTH ASSOCIATED WITH EXPOSURE TO TOXIC CHEMICALS IN THE GREAT LAKES BASIN ECOSYSTEM. The pre-Conference Briefing Book for the 1989 International Working Conference will be judged by the delegates of the Conference for its merit, and if judged suitable a publication outlet will be sought for this document. The Task Group Reports of the Conference will be put together for submission to an appropriate environmental health journal. The recommendations on needed policy changes, information gaps, and future research strategies will be developed into an Executive Summary of the Conference Proceedings and published under separate cover. The Executive Summary will be developed primarily to get the summary results and recommendations to governmental agencies and the public in both Canada and the U.S. in a timely fashion.

With the aid of public information dissemination groups, such as the Center for the Great Lakes and Great Lakes United, we will also seek input regarding the public's view of important issues. These special interest groups will be consulted during our editing of the Briefing Book and asked to edit the scientific book into a form that is able to be read by the public. We will also ask these special interest groups to do the same task with the products of the 1989 International Working Conference.

Within two months after the completion of the International Working Conference, in conjunction with the above identified special interest groups, we will plan and host an additional 1-2 day Conference in order to seek public participation in the process of evaluating risks to human health associated with exposure to toxic chemicals in the Great Lakes basin. In addition, in the spring of 1990, to achieve a broad public dissemination of conference findings, we propose the use of audio-visual teleconferencing as a means of conveying the information to the entire Great Lakes basin public.

#### PROJECT SIGNIFICANCE:

The goal of this initiative is to reduce public and scientific uncertainty, identify health impacts, if they exist, and define a research agenda. We intend to influence public and private sector policy toward incorporating a more comprehensive, cross-disciplinary approach to the assessment and reduction of risk to human health from exposure to toxic chemicals in the Great Lakes Basin ecosystem. By considering the perspective that social scientists and special interest groups can bring to issues of toxic chemical effects on human health in light of sustainable development philosophies, we will also develop an understanding of the economic and social values that demand protection of human health, yet impede resolution of exposure to toxic chemicals.

The results of this effort will be the integration of our present knowledge, the identification of key problems and information gaps, and the definition of research that is comprehensive and considers what has to be done to demonstrate effects from toxic chemicals to the ecosystem. If this effort develops a consensus on harmful effects from the presence of toxic chemicals in the Great Lakes, the research strategy will target data needs and information synthesis that represent a vision for prevention of disease in human populations. The data analysis and synthesis will also provide guidance to change human behavior and reduce risks to health from exposure to these chemicals.

This initiative, by its multidisciplinary and international design, will encourage collaboration between scientists, institutions, and countries in addressing the collection of needed data and formulation of policies that are required to comprehensively deal with the topic of toxic contaminants in the Great Lakes Basin. For example, the process described above will provide a forum for the discussion of common policy between various jurisdictions in the countries of Canada and the U.S., regarding conflicting consumption regulations, in light of the need to enhance the public's confidence.

Although effects of toxic chemicals on human health and the environment are a global issue, this project has a Great Lakes focus because this region represents a "mesocosm" for study of toxic exposure problems that have global significance. This is the case because the Great Lakes represents a region of the world that incorporates the complexities of international jurisdictional problems in a relatively confined and most easily studied area. We feel that by studying the Great Lakes, we can develop models of understanding for problems associated with toxic chemical exposure that can then be applied in a similar context any place on earth. Therefore, we want to encourage global collaboration on the issue of toxic chemicals and human health. Thus, we are seeking involvement by social, biological, and physical scientists and



participation is anticipated from Canada and the U.S. as well as other countries of the world.

We want to conclude this process with recommendations for a research strategy that are achievable and have practical application. The research strategy will define approaches that consider the present availability of scientists and tools for solving the problems identified. The recommendations will seek practical solutions.

all Conference participants. After a keynote address, the facilitators of each breakout work group will report on the discussions and conclusions from their group. Following these reports, there will be a period for discussion and questions on the work group reports by all participants.

### TASK THREE

In order to achieve maximum dissemination of the results of this entire project, including the public participation component, we feel that the use of audio-visual technology is a must. Therefore, at least two video tape documentaries are planned to capture the parts of this project that will be of most interest and use to the public in the Great Lakes Basin ecosystem.

One of these video tapes will focus on the overall scope of the project and highlight the process that was used to evaluate risk to human health from toxic chemical exposure in the Great Lakes. In emphasizing this process, the key scientific, governmental, and public conclusions and recommendations will be captured on the tape for effective dissemination of project results to a wide audience.

A second video tape will be produced to emphasize the actual concept of risk assessment as it was used during the proceedings of this project. This video tape will be produced in a format that is applicable to the school room setting as well as the adult public. The intent of this video tape will be to educate the public on the concept of risk and how it applies in our every-day decision making regarding the issue of human exposure to environmental toxic chemicals.

In addition to the above efforts at sharing the outcome of this effort with the public, in the spring of 1990, to achieve a much wider public dissemination of conference findings, we propose the use of audio-visual tele-conferencing as a means of conveying the information to the entire Great Lakes basin public. Through this process we will attempt to capture and integrate the key components of the entire project in an attempt to reduce uncertainty in the public on the subject of human risk and toxic chemical exposure in the Great Lakes basin.

TABLE 3. Tentative Agenda for Public Participation Conference.

EVALUATING RISKS TO HUMAN HEALTH ASSOCIATED WITH EXPOSURE TO  
TOXIC CHEMICALS IN THE GREAT LAKES BASIN ECOSYSTEM

PUBLIC PARTICIPATION CONFERENCE

December 1989  
Niagara Falls, New York

DAY ONE

9:00 AM OPENING PLENARY SESSION

- Welcome
- Overview and Orientation of Why the Great Lakes has a Problem. Dr. Jack Vallentyne, co-Chair, IJC
- KEYNOTE ADDRESSES
  - Mr. William Reilly, Adm., U.S. EPA (tentative)
  - Mr. Thomas McMillan, Minister of the Environment, Canada (tentative)
- DISCIPLINE GROUP FACILITATOR REPORTS FROM APRIL WORKSHOP

12:00 PM Lunch

1:00 PM PLENARY SESSION Continued

- TASK GROUP FACILITATOR REPORTS FROM OCTOBER INTERNATIONAL WORKING CONFERENCE
- Assignment to Breakout Work Groups and Charge to Groups

3:30 PM PUBLIC WORK GROUPS MEET AND ORGANIZE TASKS AND DISCUSSION SUBJECTS

6:00 PM Dinner

7:30 PM Work Group Facilitator Meeting

9:00 PM Social

DAY TWO

9:00 AM PUBLIC WORK GROUPS Reconvene to continue discussions

12:00 PM Lunch

1:00 PM Work Group Facilitator Meeting

1:30 PM CLOSING PLENARY SESSION

- KEYNOTE ADDRESS
  - Dr. David Suzuki (tentative)
- PUBLIC WORK GROUP FACILITATOR REPORTS
- Participant discussion and questions on reports

6:00 PM Conference Close

EVALUATING RISKS TO HUMAN HEALTH ASSOCIATED WITH EXPOSURE TO  
TOXIC CHEMICALS IN THE GREAT LAKES BASIN ECOSYSTEM


WHILE THERE IS A WEALTH OF INFORMATION ON VARIOUS HEALTH IMPACTS RANGING FROM FISH CONSUMPTION ADVISORIES TO DRINKING WATER ALERTS, GOVERNMENTS HAVE FAILED TO COLLECT AND CORRELATE THAT INFORMATION SO THEY CAN PROVIDE RESIDENTS WITH A COMPREHENSIVE, RATHER THAN A PIECEMEAL, ASSESSMENT OF HEALTH RISKS FROM TOXIC EXPOSURE. (Source: IJC Commissioners Report May 1989)

- PROVIDE INTERPRETATION AND ADVICE ON PUBLIC POLICY ISSUES WITH RESPECT TO HUMAN HEALTH PROBLEMS ASSOCIATED WITH ENVIRONMENTAL QUALITY IN THE GREAT LAKES BASIN
  
- ASSESS THE CURRENT INFORMATION AVAILABLE AND SUGGEST GAPS IN SCIENTIFIC DATA WHERE RESEARCH IS NEEDED LINKING TOXIC CHEMICAL EXPOSURE TO HUMAN HEALTH
  
- EVALUATE THE RELATIONSHIP BETWEEN EXPOSURE TO POTENTIALLY HAZARDOUS SUBSTANCES AND HUMAN HEALTH
  
- DEVELOP A SYSTEM FOR IDENTIFYING BIOLOGICAL EVIDENCE THAT WILL PROVIDE EARLY WARNING OF POTENTIAL HEALTH THREATS FROM TOXIC CHEMICAL EXPOSURE

TABLE 2. Activities for Toxic Chemical-Human Health Effects Project.

EVALUATING RISKS TO HUMAN HEALTH ASSOCIATED WITH EXPOSURE TO  
TOXIC CHEMICALS IN THE GREAT LAKES BASIN ECOSYSTEM

PROJECT TIME-LINE

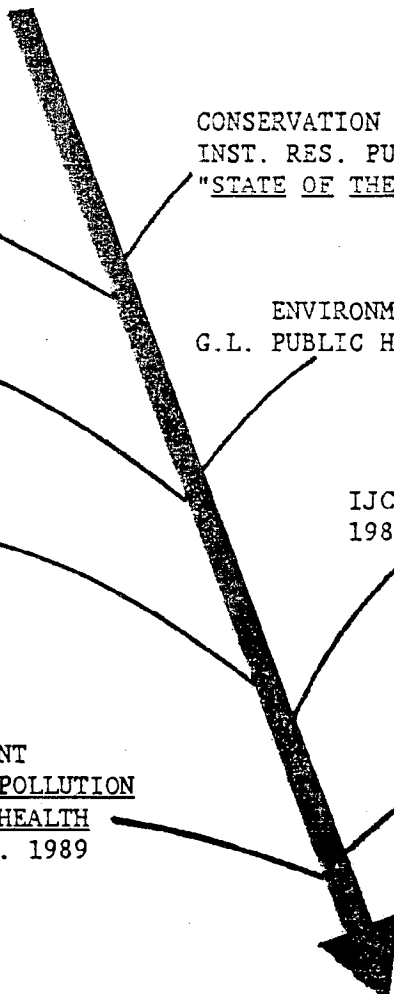
AUGUST 1988	PROJECT INITIATION - seeking of interested participants and development of Steering Committee.
OCT.- NOV. 1988	STEERING COMMITTEE MEETINGS - identity of project goals, devising strategy, and specific planning for the April Disciplinary Workshop.
APRIL 15-18, 1989	DISCIPLINARY WORKSHOP - eight discipline groups meet to identify issues, gaps, and recommendations and produce discipline summary documents.
MAY 31, 1989	DISCIPLINARY WORKSHOP SUMMARY DOCUMENTS DUE 
JUNE 9, 1989	INITIAL PLANNING FOR WORKING CONFERENCE - coordinating committee & discipline group facilitators will identify tasks and define issues for 1989 International Working Conference.
JUNE - AUGUST 1989	COORDINATING COMMITTEE WORK FOR INTERNATIONAL CONFERENCE - integration of materials for pre-conference briefing book, planning of conference, and identification of delegates. ( <u>Involvement of special interest groups will occur here to prepare for the public participation component of the project</u> )
SEPTEMBER 1989	PUBLICATION OF BRIEFING BOOK FOR CONFERENCE
OCTOBER 3-6, 1989	INTERNATIONAL WORKING CONFERENCE - to be held in Buffalo, New York.
NOVEMBER 1989	PREPARATION OF CONFERENCE EXECUTIVE SUMMARY - to disseminate conference conclusions & recommendations to governments and the public.
NOV. - DEC. 1989	PREPARATION OF OTHER CONFERENCE PUBLICATIONS
DECEMBER 1989	PUBLIC PARTICIPATION CONFERENCE - intended to allow the public to provide input on the progress of the project and conclusions drawn from International Working Conference.
APRIL 1990	TELE-CONFERRING OF INTERNATIONAL CONFERENCE RESULTS & CONCLUSIONS TO ENTIRE GREAT LAKES BASIN

EVALUATING RISKS TO HUMAN HEALTH ASSOCIATED WITH EXPOSURE TO TOXIC CHEMICALS IN THE GREAT LAKES BASIN ECOSYSTEM

SUNY BUFFALO APRIL 1989 WORKSHOP



SUNY BUFFALO DISCIPLINE INTEGRATION



IJC 1988 EPIDEMIOLOGY WORKSHOP RESULTS

CONSERVATION FOUNDATION & INST. RES. PUBLIC POLICY "STATE OF THE LAKES" document

CONTAMINATED FOOD & CANCER RISK NIEHS Conference, Sept. 1988

ENVIRONMENT & HUMAN HEALTH G.L. PUBLIC HEALTH ASSOC., OCT. 1988

BIOLOGICAL HAZARDS FROM ENVIRONMENTAL POLLUTANTS U.S. EPA Symposium November 1988

IJC CAUSE & EFFECT 1989 WORKSHOP RESULTS

CANADIAN GOVERNMENT "SYNOPSIS OF CHEMICAL POLLUTION IN THE GREAT LAKES & HEALTH EFFECTS" Report, Sept. 1989

IJC HEALTH COMM. 1989 WORKSHOP RESULTS

SUNY BUFFALO INTERNATIONAL WORKING CONFERENCE OCTOBER 1989



PUBLIC PARTICIPATION CONFERENCE  
December 1989

EVALUATING RISKS TO HUMAN HEALTH ASSOCIATED WITH EXPOSURE TO  
TOXIC CHEMICALS IN THE GREAT LAKES BASIN ECOSYSTEM

TABLE 2. List of Discipline Group Issues Identified From April 1989 Workshop.

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- \* In contrast to other regions, how do the Great Lakes compare regarding toxics in the environment?
  - \* What are the fates and persistence of toxic chemicals in the Great Lakes?
  - \* What are the existing barriers that have prevented an ecosystem perspective on toxics and their management?
  - \* What can we learn from toxic impacts observed in fish & wildlife and can these species be used as "early warning devices"?
  - \* What are the general categories of toxics that are of concern in the Great Lakes and what are the relative toxicities of these substances?
  - \* Are there differences between what is measured in the environment (e.g. surrogate species, specific time periods) and what humans are exposed to?
  - \* How important is it to not consider the reality of multiple exposure risk to target populations, and do we possess the methodologies and data bases to do so?
  - \* What effects, if any, result from prolonged ingestion of fish and water containing trace levels of toxic chemicals?
  - \* What are the reproductive and developmental toxicities of halogenated aromatic hydrocarbons in mammalian systems?
  - \* Are there any examples of known injury to human health from Great Lakes toxic contaminants?
  - \* What research methods are available to quantify the different patterns of toxic exposure risk and to "tease out" potential interactive effects from combined chemical insults on human health?
  - \* What methodologies are available to establish exposure concentrations of toxic contaminants to humans and to relate these in a cause-effect fashion to disease outcomes in the exposed populations (e.g., what are appropriate end-points)?
  - \* What are the demographics of populations consuming fish in the Great Lakes?
  - \* How does one identify critical subpopulations subject to effect of toxic exposure under the assumption of no average populations?
  - \* What are the sociologies and perceptions of populations consuming fish in the Great Lakes?
  - \* At times, people care about the environment per se, yet only concern for human health has regulatory status. Should we be willing to overprotect human health in order to protect the environment?
  - \* What are the psychological impacts (e.g. stress & helplessness) on communities exposed to toxic chemicals and how does one compare the level of effect from these impacts to the physical threat from pollution?
  - \* How do we convert reactive interest in toxic chemicals (i.e. NIMBY reaction) into proactive efforts?
  - \* What are the benefits and costs (including "concealed costs") in ignoring the long-term burdens to society for the sake of short-term gains with respect to economic exploitation of resources that may be harmful to human health?
  - \* What are the sacrifices people are willing to make (e.g. willingness to pay) for good environmental quality?
  - \* Are present statutory frameworks reasonable and effective in light of the large data requirements and the impossibility of meeting these requirements?
  - \* Are existing institutional frameworks adequate for development and appropriate interpretation of toxics data for the Great Lakes and for management of biological, physical, and social dimensions of toxics risks?
  - \* Are there differences in interpretation regarding how risk is communicated by regulatory agencies and how risk is perceived by the consumer public?
  - \* How can we do a better job of communicating risk, considering the perceptions of the fish and water consumers (e.g., older publics vs. younger publics and differences in their perceptions of good environmental quality, as well as impact from "folk knowledge"), as well as the "mixed messages" that the public gets from inconsistency in guidelines and regulations?
  - \* How can we do a better job of lessening risk associated with contaminants in the environment, and for future chemicals of concern, how can preventative strategies be put in place that have as a basis a presumption of harm to the environment and humans?
  - \* How can we learn to live with a system in which reduction of risks to even acceptable levels is economically, technically and politically unattainable?
  - \* What implications for risk management are there to considering people (especially local populations) as parts of the impacted ecosystem?
  - \* Contaminants as a human health problem: what is the role of communities and citizen participation in formulating public policy?
  - \* How do we develop a better "layperson" understanding of ecological effects in order to encourage responsible individual behavior and generate political support for legislative action?
-

TABLE 3. Tentative Agenda for International Working Conference.

EVALUATING RISKS TO HUMAN HEALTH ASSOCIATED WITH EXPOSURE TO  
TOXIC CHEMICALS IN THE GREAT LAKES BASIN ECOSYSTEM

INTERNATIONAL WORKING CONFERENCE

October 3-6, 1989

Hyatt Regency Hotel  
Buffalo, New York

TUESDAY October 3, 1989

1:00 PM OPENING PLENARY SESSION

- Welcome
- Overview and Orientation of Why the Great Lakes has a Problem. Dr. Jack Vallentyne, co-Chair, IJC
- KEYNOTE ADDRESSES
  - Mr. William Reilly, Adm., U.S. EPA (tentative)
  - ~~Mr. Tom McMillan~~, Minister of Environment, Canada (tentative)
  - Dr. David Axelrod, Comm. NY Dept. Health
- DISCIPLINE GROUP FACILITATORS REPORTS FROM APRIL WORKSHOP (See list of Facilitators above for more detail)

6:00 PM Dinner

7:30 PM TASK GROUP ORGANIZATION MEETINGS

Report on group progress, problems, changes in strategy, etc.

9:30 PM Social

WEDNESDAY October 4, 1989

7:00 AM Breakfast

8:00 AM TASK GROUPS continue discussions

12:00 PM Lunch

1:00 PM Group Facilitator Meeting

1:30 PM FIRST SET OF ISSUE GROUPS MEET

3:30 PM TASK GROUPS Reconvene to continue discussions

6:00 PM Dinner

7:30 PM SECOND SET OF ISSUE GROUPS MEET

9:00 PM Group Facilitator Meeting

*not yet  
approved*



Table 2. Continued

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THURSDAY October 5, 1989

7:00 AM Breakfast  
8:00 AM TASK GROUPS Reconvene to continue discussions  
12:00 PM Lunch  
1:00 PM Group Facilitator Meeting  
1:30 PM THIRD SET OF ISSUE GROUPS MEET  
3:30 PM TASK GROUPS Reconvene to continue discussions  
6:00 PM Dinner  
7:30 PM TASK GROUPS Reconvene to continue discussions  
10:00 PM Group Facilitator Meeting

FRIDAY October 6, 1989

8:00 AM Breakfast  
9:00 AM TASK GROUPS Reconvene to prepare Plenary Session Reports  
11:00 AM Group Facilitator Meeting  
- To make sure that everything is in order for the Plenary  
Session on Friday afternoon  
12:00 PM Lunch  
1:00 PM CLOSING PLENARY SESSION  
- KEYNOTE ADDRESS  
Dr. David Suzuki, Univ. British Columbia (tentative)  
- TASK GROUP FACILITATOR REPORTS  
- ISSUE GROUP REPORTS  
- Delegate discussion and vote on each of the TASK GROUP REPORTS  
6:00 PM Conference Close

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EVALUATING RISKS TO HUMAN HEALTH ASSOCIATED WITH EXPOSURE TO  
TOXIC CHEMICALS IN THE GREAT LAKES BASIN ECOSYSTEM

Figure 1 illustrates the manner in which the TASK GROUPS and ISSUE GROUPS will interact during the October 1989 International Working Conference. Each member of a Task Group will leave that group at least once during each Conference day and go to a two-hour meeting of a specific Issue Group where all other members of this Issue Group come from different Task Groups. The result is that there will be a complete mixing of ideas and perspectives on the issues and tasks that are being addressed by this dynamic process and thus, new thoughts will always be "put on the table" of the Task Group from which each of the Issue Group members comes. As an example of focus, these Task Groups will cover such areas as public awareness and new training initiatives under Education, jurisdictional problems and scientific interpretation under Policy, and interdisciplinary investigation and scientific results dissemination under Research.

FIGURE 1. Indication of Matrix Design for Dynamic Interactions During the International Working Conference.

		<u>TASK GROUPS</u>					
		<u>EDUCATION</u>		<u>POLICY</u>		<u>RESEARCH</u>	
		Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Day 2 1:30 PM	<u>ISSUES GROUPS</u>						
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Day 2 7:30 PM	6						
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Day 3 1:30 PM	12						
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