

PUBLIC RESPONSIVENESS DOCUMENT  
Lake Ontario Toxics Management Plan

Lake Ontario Secretariat

April 29, 1991

## Introduction

On February 4, 1987, the Four Parties (the U.S. Environmental Protection Agency (EPA), Environment Canada (EC), the New York State Department of Environmental Conservation (DEC), and the Ontario Ministry of the Environment (MOE) signed a document known as the "Declaration of Intent" which outlines the principles to be followed in the pursuit of a common goal to reduce loadings of toxic chemicals to Lake Ontario through appropriate joint actions and separate agency activities. The Declaration of Intent, combined with a detailed work plan, is entitled the "Lake Ontario Toxics Management Plan" (LOTMP). The LOTMP work plan is updated regularly to report progress in meeting plan commitments, and to present follow-up commitments.

The Four Parties are in the process of updating the LOTMP for the first time -- reporting progress on commitments in the 1989 Report by the Lake Ontario Toxics Committee, and proposing follow-up commitments to reduce the load of toxics entering the lake. A number of refinements and new commitments have been added in the 1991 Update.

On December 10, 1990 in Rochester, New York, and on December 13, 1990 in Burlington, Ontario, the Four Parties held public workshops on the draft 1991 Update of the Plan. Attachment I presents the Issues for Discussion document developed by the Four Parties to help focus the discussion at the workshops. From these documents, the LOTMP identified nine questions that it will soon have to prepare recommendations on and for which public input would be most useful.

The workshops began with a plenary session which included an overview of the 1991 LOTMP Update and a summary of the Issues for Discussion document. The participants were then divided into three breakout groups, each of which included a facilitator, a recorder, and a resource person from the Four Parties.

The workshops were organized around three overriding issues for discussion:

- o setting appropriate targets for the LOTMP,
- o data management, and
- o institutional management.

Each group was presented with nine questions focussing on these issues which formed the basis for discussion in the breakout groups. Comments were sought on these questions and on other issues that a group wished to address in addition to or in place of the selected questions. At the Hamilton, Ontario workshop, the facilitators reported results from each of the break-out groups in a closing plenary session. Participants in the Rochester workshop opted to spend more time in the breakout groups, and dispensed with the closing plenary session.

In addition to the comments gathered at the workshops, two individuals submitted written comments. Those have been included in the summary as well. Attachment II lists the participants at each workshop and presents a complete set of the public's questions, comments and recommendations as reported from each workshop.

Following is:

- o a summary of views expressed both at the workshops and those submitted by mail, and
- o the Four Parties's response.

## SETTING APPROPRIATE TARGETS FOR THE LOTMP

**Question #1:** Is the goal statement for the LOTMP adequate?

### What the Public Says

There was general agreement that the goal statement was adequate. Concern was expressed, however, that:

- o One of the goals of the LOTMP is ". . . fish that are safe for unlimited human consumption." Is this achievable in our lifetimes?
- o The LOTMP efforts should focus on exceedences of existing standards and criteria.

### Response

*On achieving LOTMP goals . . .*

The work of the Fate of Toxics Committee (FOTC) should provide an answer to the time frame in which the goal will be achieved. Currently, by far the greatest reservoir of toxic chemicals in the Lake Ontario system is thought to lie within the lake's sediments. During severe storms, a portion of these toxic chemicals can be resuspended from the sediments into the lake water column, enter the lake food chain, ultimately ending up in fish. Even if all inputs of toxic chemicals to Lake Ontario were eliminated today, it would take a number of years for all the toxics, the legacy of past discharges and releases, to be flushed from the lake system. The mass balance model will provide our best estimate on how long, and under what conditions, this LOTMP goal will be achieved.

In December, 1990, the FOTC provided the Four Parties with a "time-variable" mass balance model for Lake Ontario toxics. Keeping in mind that this model has yet to be calibrated or verified against actual field data, and that the model output does not yet contain measures of the variability around or level of confidence in estimates, a preliminary run of the model indicates that, for example, if PCB inputs to Lake Ontario were eliminated today, it might take from 40-50 years for the level of PCBs in salmonids to decrease to the level of the most stringent Four Party criteria. Any continuing discharge of PCBs to the lake would extend that date into the future.

The preliminary results of the mass balance model, which will be revised based on additional data collection and model calibration and verification, indicate the importance of eliminating discharges of toxics to the lake system, if the goals of the LOTMP are to be achieved.

On focussing on existing standards and criteria . . .

As an interim step towards the objective of zero discharge of toxics, the LOTMP targets, for a comprehensive series of specific agency and Four Party actions, those toxic chemicals that exceed the most stringent Four Party standards and criteria, as identified through the annual categorization process. Our primary reason for using this approach is to be able to move quickly to take action to reduce the loadings of toxic chemicals to the lake. However, as the workshop discussions of the four proposed methods of setting LOTMP targets demonstrated, the chemical-specific approach has benefits and shortcomings, as do the other approaches. Our intention is to use a mix of approaches that will achieve the optimal environmental results, both short-term and long-term.

**Question #2:** What are the pros and cons of the four methods:

- o Ecosystem objectives,
- o Chemical-specific ambient standards,
- o Arbitrary load reductions, and
- o Waste minimization requirements to achieve zero discharge

of setting targets?

**Method #1: Ecosystem Objectives**

What the Public Says

The public felt that an ecosystem objectives approach to setting targets had much to offer. They felt that the major advantage of this approach was that:

- o It represents the ultimate answer to setting standards, and is an improvement over current, chemical-specific standards and criteria, in that ecosystem objectives look at interrelationships among systems.

At the same time, the public felt that this emphasis on system interrelationships was the greatest drawback of the ecosystem objectives approach.

- o This approach doesn't really allow direct control over individual toxics and doesn't easily relate reductions of individual toxics to attainment of ecosystem goals.

Other comments on the use of ecosystem objectives were also made:

- Stocked fish species should not be used as indicators for ecosystem objectives.

- How will ecosystem objectives be used to evaluate LOTMP progress?
- How costly will it be to evaluate LOTMP progress using ecosystem indicators?
- What constitutes a healthy lake ecosystem?
- Agency staff should be aware of these objectives and use them in day-to-day decision making.

### **Response**

With the adoption of the Ecosystem Objectives for Lake Ontario by the Four Parties, progress towards these Objectives will be a measure of the adequacy of the day-to-day regulatory efforts to control toxics in Lake Ontario. The advantages and disadvantages of ecosystem objectives are a function of the nature of these objectives. Based on its experience in developing ecosystem objectives and indicators, the Ecosystem Objectives Work Group (EOWG) advised the Four Parties that it will probably not be possible to design ecosystem objectives and indicators that relate directly to individual toxic chemicals, or even to groups of chemicals. The indicators that will finally be proposed will be focussed on toxic impacts to the degree possible, but will certainly integrate a level and breadth of environmental impact that extends beyond the impacts of toxic chemicals alone. This outlook advises against relying solely on ecosystem objectives and indicators in measuring LOTMP progress and success, but using them in concert with chemical-specific quantitative standards or criteria.

#### *On the use of stocked fish as indicators . . .*

- o The indicators for the fisheries objectives are now being developed. It is the intent of the Four Parties that they focus on native fish species.

#### *On how objectives can measure progress . . .*

- o Quantitative indicators for each ecosystem objective are now being developed by the Ecosystem Objectives Work Group. The objectives are related to the goals of the LOTMP, and the indicators will enable the Four Parties to quantitatively measure progress towards those goals through attainment of the objectives. As outlined in Table VII of the LOTMP, the Four Parties will issue regular status reports on attainment of the objectives following adoption, by the Coordination Committee, of the objectives and indicators.

*On the cost of using objectives . . .*

The technical subcommittees are developing a workplan and schedule for indicator development and monitoring. The first of these plans, which will include cost estimates, should be submitted to the Four Parties in early 1991.

*On what constitutes a healthy lake ecosystem . . .*

The best definition of what constitutes a healthy lake ecosystem can be found in the goal statements developed by EOWG:

- o The Lake Ontario ecosystem should be maintained, and as necessary restored or enhanced, to support self-reproducing, diverse biological communities.
- o The presence of contaminants shall not limit the use of fish, wildlife and waters of the Lake Ontario basin by humans and shall not cause adverse health effects in plants and animals.
- o We as a society shall recognize our capacity to cause great changes in the ecosystem and we shall conduct our activities with responsible stewardship for the Lake Ontario basin.

**Method #2: Chemical-specific ambient standards**

What the public says

Discussion of the pros and cons of chemical-specific ambient standards presented a virtual mirror image to that for ecosystem objectives. The advantage of specific standards was stated as:

- o They are hard and fast numerical standards; simpler to monitor, communicate, and measure progress against.

This advantage was, in turn, among the major disadvantages of chemical-specific ambient standards that were discussed:

- o Chemical-specific standards do not take all effects into account. Concentrations of toxic chemicals at current detection levels may not protect the environment.

There was also concern that chemical-specific standards might place the LOTMP in conflict with the goals of the Great Lakes Water Quality Agreement:

- o Chemical-specific standards for the LOTMP would be in conflict with the "virtual elimination" goal of the 1978 Great Lakes Water Quality Agreement. Even if chemical-specific standards are used to "ratchet down" towards the

virtual elimination goal, what process would be used to select the interim standards?

Other comments were made on the use of chemical-specific standards:

- Standards other than zero discharge are not appropriate for synthetic chemicals, since these do not appear naturally in the environment.
- How is "most sensitive species defined?"

### Response

The first two points are just as accurate in a discussion of chemical-specific standards as the corresponding points were for ecosystem objectives. Neither of these approaches alone will provide information sufficient to the Four Parties' needs in tracking progress towards meeting all the goals of the LOTMP. Used in concert, they can provide a good check and counter-check.

Chemical-specific standards are not envisioned as the end target to meet the goals of the LOTMP but as interim milestones used to measure plan progress and drive the categorization process. The Four Parties have concurred that, for purposes of categorization, the most stringent Four Party standard or criteria will be used.

Use of chemical specific-standards would not place the LOTMP in conflict with the "virtual elimination" goal of the 1978 GLWQA. As outlined in the update of the LOTMP, the fourth objective of the plan is "zero discharge" from both point and nonpoint sources. Achieving zero discharge will, in time, result in the virtual elimination of toxics from the lake system.

*On defining "the most sensitive species" . . .*

The simplest answer to this question is to test the organisms. However, we know of no simple answer that also defines the criteria for determining which organism is the most sensitive. Annex 10 of the Great Lakes Water Quality Agreement identifies criteria to be applied to hazardous contaminants, such as acute toxicological effects, as determined by whether the substance is lethal to:

- i) one half of a test population of aquatic animals in 96 hours or less at a concentration of 500 mg/l per kg of body weight; or

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- v) aquatic flora measured by a maximum specific growth rate or total yield of biomass which is 50% lower than a control culture over 14 days in a medium at concentrations equal to or less than 100 mg/l.

Perhaps a more practical answer is to consider an organism sensitive if it exhibits acute effects from a toxic at less than the median concentration for Lake Ontario organisms; and to consider an organism the most sensitive if it, or a critical life stage, shows acute or chronic effects at the lowest concentration found. Another approach would be to limit this screening process to the important organisms in the lake, based on ecosystem, economic, and recreational importance. The ongoing work of the Ecosystem Objectives Working Group, in developing indicators of ecosystem health, may be helpful in providing additional definition of what constitutes a "most sensitive species."

### **Method #3: Arbitrary load reductions**

#### What the Public Says

The public felt that arbitrary load reductions were a good initial step to reduce toxic chemicals in the lake until more targeted approaches could be developed.

- o This is useful as an initial step. It has political appeal and can be considered a stopgap measure until better techniques are developed.

However, the arbitrary nature of this approach was viewed as its major drawback.

- o The cause and effect of this approach on achieving goals of the LOTMP are unclear.

The public had several suggestions on improving this approach.

- o The Four Parties need to explain the methods industry could use to implement this approach. In particular, the Four Parties should:
  - analyze the economic impact to industry of arbitrary load reductions,
  - ensure that any economic impact analysis should also include a study of the impact of this approach on human health and natural systems in the lake basin; and
  - investigate current pollution prevention programs and develop expertise in this area.

- the Secretariat needs to explain the methods that would achieve reductions in loads, for each priority toxic, that would be used in this approach.

## Response

Consistent with the Great Lakes Water Quality Agreement, the Four Parties agree that zero discharge of persistent toxic substances is the ultimate goal for Lake Ontario. To move in that direction, interim, arbitrary load reduction goals may be a useful tool. Arbitrary load reduction targets have proved successful in the Niagara River Toxics Management Plan (NRTMP) where the Four Parties have agreed to the 1996 target of a 50% reduction in point and nonpoint discharges of persistent toxic chemicals of concern into the Niagara River Basin. Although the ultimate goal of the NRTMP is the same as that of the LOTMP (zero discharge) the 50% goal has been a valuable tool to drive programs and ensure accountability in toxics reductions in the Niagara River basin.

Establishing any load reduction target, first requires reliable estimates of loads of priority toxic chemicals of concern entering the Lake Ontario system. A key step is the identification of methods, for each toxic, that would provide effective, quantifiable load reductions. Arbitrary load reduction targets can then play a valuable role as interim goals in the LOTMP through the following framework:

- o Attainment of initial, arbitrary load reduction targets, followed by
- o Attainment and maintenance of the most stringent Four Party water column and fish tissue standards and criteria in Lake Ontario, in concert with,
- o Zero discharge of toxics to the lake.

### *On the role of pollution prevention . . .*

In order to make further progress towards the goals of virtual elimination and zero discharge as embodied in the Great Lakes Water Quality Agreement and the LOTMP, the Four Parties are committed to evaluating how pollution prevention activities can be incorporated into the LOTMP (see Appendix X of the draft 1991 Update).

In particular, the Four Parties have developed Pollution Prevention Initiatives for both the U.S. and Canadian sides of the lake. These initiatives build on, and are complementary to

the existing pollution prevention activities of the individual agencies.

With regards to Lake Ontario, the key objectives of the U.S. initiative are to:

- o Determine how industrial facilities located in the lake basin can better apply pollution prevention techniques to reduce their releases of toxic chemicals to air, land and water; and
- o Develop a joint industry/governmental initiative on pollution prevention.

The key objectives of the proposed Canadian initiative are to:

- o Facilitate and highlight government-industry cooperation in achieving source control and zero discharge of toxic substances under the LOTMP;
- o Increase industry and municipal awareness of existing nonregulatory programs that support source control and zero discharge;
- o Identify opportunities for partnership and information sharing leading to development of pollution prevention projects; and
- o Provide a visible means of documenting and tracking progress of specific pollution prevention commitments.

At the same time, the US-EPA and Environment Canada are working to reach agreement on a pollution prevention plan at the binational level. The binational and Four Party efforts will be complementary and will include pilot projects, one U.S. and one Canadian, in the Lake Ontario basin. These pilot projects will provide technical guidance for similar pollution prevention efforts elsewhere.

#### **Method #4: Waste minimization requirements to achieve zero discharge**

##### **What the Public Says**

The public generally felt that waste minimization was an excellent, long-term approach to the problem.

- o This approach encompasses a good opportunity to reduce toxics now in use, and to work positively with industry.

Equally importantly, the public seems ready and willing to learn about this issue and be a part of the solution.

- o Rather than working toward "managing toxics", the Four Parties should be working toward banning toxics.

The major drawback of this approach that the public foresaw was that some toxics could not be regulated through waste minimization.

- o The Four Parties will need another approach for toxics that are in the environment, but are no longer being produced by industry.

There were also suggestions on how to improve this approach.

- o Waste minimization should be incorporated into the BAT regulations.

Other comments on using minimization to achieve zero discharge were also made.

- This approach should focus on reducing the production of waste rather than treating waste.
- Consumers should be targeted as well as industry.
- Waste minimization should be incorporated into the entire regulatory framework.
- The Four Parties should identify the components of a model pollution prevention program and disseminate this information to other agencies.
- The goal of achieving zero discharge should include more than just prohibiting the discharge of "persistent" toxic chemicals, it should also pertain to shorter-lived, acutely toxic chemicals.

### Response

For those toxics that can be regulated through permit action, the Four Parties have adopted waste minimization, or pollution prevention as an important means to achieve the goal of zero discharge of toxics to Lake Ontario. To that end, the Four Parties have adopted Pollution Prevention Initiatives (see above) and are about to embark on pilot pollution prevention projects, that target citizen as well as industry efforts, in the lake

basin. These projects should serve as guides for similar efforts in pollution prevention elsewhere in the Great Lakes.

*On controlling "unregulated toxics" . . .*

The Four Parties also recognize that reducing inputs to the lakes of toxics that are outside the standard regulatory framework of command and control permitting and standards and criteria will require a new approach.

Of the nine IA or IB toxics identified in the categorization of toxics in Lake Ontario (see Table 3 of the 1991 Update), four (DDT, chlordane, mirex and dieldrin) are either no longer produced in the U.S. or Canada or have production and uses that are severely limited. Reductions of loads of these toxics will require understanding and control of nonpoint source loads. Currently, the Four Parties are developing a methodology to estimate such nonpoint source loads from the U.S. and Canadian sides of the Lake Ontario basin. When this methodology is implemented, the results will provide an indication of the relative contribution of various nonpoint load sources to the total toxic chemical load entering Lake Ontario.

The nonpoint source methodology will allow investigation of efficient allocation of resource, the effectiveness of alternative control strategies, and the validity of such concepts as "virtual elimination" and "zero discharge." Such efforts will be especially important in designing control strategies for such "unregulated" toxics.

*On Pollution Prevention and BAT . . .*

Pollution prevention is incorporated into BAT (Best Available Control Technology Economically Achievable) Regulations. EPA is currently updating nine Guidelines for BAT and all will include process changes and technological innovations to maximize pollution prevention. Eight of the nine guidelines should directly reduce toxic inputs into Lake Ontario. The industries affected and the schedule for guideline promulgation are:

Offshore oil and gas (marine)	1995
Coastal oil and gas	1995
Pharmaceutical production	1994
Pulp and paper production	1995
Centralized waste handlers	1995
Machinery manufacturing	1995
Organic chemicals and plastics	1993
Pesticide manufacturing	1992
Pesticide formulating and packaging	1992

Question #3 How do you see the ecosystem objectives being incorporated into the LOTMP?

## What the Public Says

The public had few comments on this issue. They were mostly concerned about the types of indicators that are being developed for the objectives.

- o The Four Parties should take into account the political implications of developing indicators based on salmonids.
- o The Four Parties should outline what kind of monitoring will be needed for each indicator.

There were also some suggestions on specific indicators.

- o The Four Parties should evaluate using:
    - the natural reproduction of bald eagle and sturgeon,
    - Alewife, zooplankton, and phytoplankton
    - the elimination of exotic species, and
    - benthic organisms.
- as indicators.

## Response

The primary function of an ecosystem indicator is to integrate many ecosystem characteristics as they relate to toxic impacts. Therefore, an indicator is simply a measure of the degree of deviation from an adopted set of ecosystem objectives. Their value is heightened by the degree they correspond with changes in these ecosystem characteristics. Selecting or modifying indicators based on any "political" criteria would defeat the purpose of having objectives and indicators in the first place.

With the above in mind, the Four Parties have requested that the Ecosystem Objectives Work Group (EOWG) develop objectives and indicators for Lake Ontario. The EOWG has submitted a final report outlining overall goals for ecosystem quality in Lake Ontario and five specific objectives for the lake (see 1991 Update of the LOTMP). The EOWG has also established technical subcommittees to develop quantitative indicators for each objective. These five subcommittees began work in the fall of 1990. During the course of designing the indicators, the committees will outline monitoring programs to track the individual indicators. The first reports outlining the indicators and monitoring programs are scheduled to be submitted to the Four Parties in 1991.

*On recommendations for specific indicators . . .*

As mentioned above the specific indicators are now being developed by the technical subcommittees. The status of bald eagle populations has been recommended many times as an important indicator of the impact of persistent toxic chemicals on wildlife populations. It is likely that the status of populations of bald eagle or other fish-eating raptor in the Lake Ontario basin will be included as one of the indicators for the wildlife population ecosystem objective.

There are also ecosystem objectives relating to fisheries, aquatic communities and benthic communities. It is likely that the lake sturgeon will be considered as a potential indicator species by the technical subcommittee for the fisheries objective, as will other organisms in developing indicators for the other objectives.

Question #4     Do you have recommendations on ways to improve existing programs?

**What the Public Says**

Most of the comments were on the need for coordination among ongoing efforts to control toxics in the lake.

- o     What programs are planned to deal with contaminated sediments?
- o     Within and among agencies, there is a need for:
  - an ecosystem approach,
  - better communication within and among agencies, and
  - a cross-media approach.
- o     All the Lake Ontario monitoring programs need to be better coordinated to take care of the various data needs of the ongoing programs. Monitoring should be conducted at specific sites as well as the lake in general.
- o     In the LOTMP, the Four Parties should clearly explain how their current programs address specific toxics, how their targets will be met, and identify any shortcomings.
- o     Routine, unannounced inspections of dischargers would achieve better compliance.

**Response**

*On remediating contaminated sediments . . .*

The problem of contaminated sediment in Lake Ontario consists of three components:

- o sediments in nearshore and embayment areas of the lake,
- o input of contaminated sediments from lake tributaries, and
- o sediments in the deeper, offshore waters of the lake.

The Great Lakes Water Quality Agreement sets out objectives, jurisdictional standards, criteria and guidelines respecting fourteen beneficial uses of Great Lakes waters. A location where these limiting measures of water quality have been exceeded is designated an Area of Concern (AOC) and is then subject to remediation and rehabilitation. Forty-two AOCs have been identified on the Great Lakes; seven, all located in nearshore embayments, have been designated in Lake Ontario. As outlined in Appendix V of the 1991 Update of the LOTMP, a source of toxics causing impairment of beneficial uses at each of these seven AOCs arises from contaminated sediment. Thus remediation of the contaminated sediment in these AOCs is a key step in controlling the problem of contaminated sediment in nearshore and embayment areas in Lake Ontario.

The Great Lakes Water Quality Agreement calls for agencies to alleviate beneficial use impairments in the AOCs by developing and implementing action programs called Remedial Action Plans (RAPs). As outlined in Appendix V of the 1991 Update of the LOTMP, RAPs proceed in a three-step process:

- o First, the degree and types of beneficial use impairments are determined,
- o Second, remedial and regulatory measures are selected and implemented, and
- o Finally, when monitoring indicates that identified beneficial uses have been restored, the AOC is "de-listed."

All the AOCs in Lake Ontario are either in the first or second stage of this effort.

The Four Parties are also participating in a key effort to design the means to remediate contaminated sediments in the AOCs. The 1987 amendments to the Clean Water Act authorized the U.S. EPA to coordinate and conduct a five-year study and demonstration project relating to the control and removal of toxic pollutants from contaminated sediments in the Great Lakes. Five areas were specified in the Clean Water Act as requiring priority consideration in locating and conducting demonstration projects. Although none of these five sites are in Lake Ontario, one, (Buffalo River Harbor) flows directly into the Niagara River, a major tributary to the lake.



Environment Canada administers the Great Lakes Cleanup Fund (GLCF), a \$55 million, five-year initiative under which remediation of contaminated sediments will be addressed. Included under the GLCF is establishment of biological methods for assessing sediment remediation requirements, demonstration of techniques for: sediment removal; and both in situ and on-land treatment. Demonstration projects are currently being launched in Hamilton and Welland, Ontario.

In response to the 1987 amendments, GLNPO initiated the Assessment and Remediation of Contaminated Sediments (ARCS) Program. ARCS is an integrated program for the development and testing of assessment and remedial action alternatives for contaminated sediments. Information from ARCS Program activities will be used to guide the development and implementation of RAPs in all AOCs. The results of the ARCS program and their implementation in the AOCs through the RAPs will be the major means of remediating contaminated sediment in nearshore and embayment areas of the Lake.

The effort to regulate contaminated sediment entering the lake from tributaries is less well developed. A first step is to develop estimates of the relative importance of toxic sediment loads from tributaries in the nonpoint source methodology now under development (see above). These tributary loading estimates can then be compared with estimates of load from deep sediment resuspension developed through the mass balance model.

Comparison of these estimates of sediment loadings will indicate the relative importance of each aspect of lake sediment as a source of toxic loadings. The nonpoint source methodology will also provide guidance on which source of nonpoint loads will lend themselves to the most efficient remediation.

The third source of contaminated sediment, that lying in the deeper, offshore waters of the lake, is less amenable to control. It is unlikely that any remediation will be possible. Reduction of these toxics will, most likely, depend on natural processes such as bio-, photo-, or chemical-degradation and advection via the St. Lawrence River.

#### *On the role of multi-media enforcement . . .*

In the past, agency enforcement has been media-based and dependent on command and control regulation. Particularly in EPA, that focus is changing to a multimedia, ecosystem-based approach. The toxics management plans for Lake Ontario and the Niagara River are prime examples of that effort. Specifically, the nonpoint source estimation methodology, now being developed, and the mass balance models developed by the Fate of Toxics

Committee integrate loadings from differing media and source categories and predict flow of toxics through the lake system.

*On the need to coordinate monitoring . . .*

The Four Parties recognize that much of the current monitoring in the Lake Ontario basin, conducted by different state, provincial and federal agencies, and often with single purposes in mind, is not often applicable to multi-media focussed initiatives. Through the Categorization process, the Four Parties evaluate all ongoing monitoring programs, lakewide and well as local in scope, as to their importance in define lake-wide toxic problems. The Four Parties are undertaking two efforts to determine which current Lake Ontario monitoring efforts can be incorporated into the lakewide effort. The first effort is the nonpoint source methodology now be developed. Much of the data used to develop nonpoint source load estimates through this methodology will come from ongoing monitoring efforts. In December 1990, the Four Parties held a workshop on the nonpoint source methodology in Buffalo, New York. Experts from the both the U.S. and Canada attended. A major focus of the workshop was the availability and consistency of data from monitoring programs throughout the Niagara River and Lake Ontario basins. More information on this issue will be included in the final report on the methodology, which is expected to be submitted to the Four Parties for its review in early 1991.

In addition, the Fate of Toxics Committee is now evaluating its data needs to continue its mass balance modelling efforts. One of the specific charges to the Committee from the Four Parties is to determine the degree existing loadings and environmental conditions monitoring programs on Lake Ontario can be incorporated into this continuing project.

*On how the Four Parties will report and measure progress . . .*

Through the categorization process, the LOTMP is targeted to specific toxics. This process, outlined more fully in the 1991 Update of the LOTMP, screens all reasonably available data concerning the presence of individual toxic chemicals in the Lake Ontario system. It then places each chemical into one of seven categories based on presence or absence of ambient, lakewide data for the toxic chemical and existing standards and criteria (See Tables 3, 4 and 5) of the 1991 Update of the LOTMP). Thus categorizing a toxic chemical drives category-specific management actions outlined in the LOTMP (see Table 6 of the 1991 Update).

The intent of the LOTMP is outlined in first, the goal statement, and then in the four associated objectives; particularly the objective relating to zero discharge. As a check on the chemical-specific approach, the Ecosystem Objectives Working

Group has established a set of objectives for the lake ecosystem and are at work developing quantitative indicators of ecosystem health for each objective. As interim milestones towards achieving zero discharge, the LOTMP goal statement and the ecosystem objectives, the Four Parties have recognized the number of toxics that exceed the most stringent standard or criteria, as determined through the categorization process, as an important interim measure of success of the LOTMP. Progress on both, reducing the degree to which standards are exceeded, and the number of toxics that exceed standards is regularly evaluated through the annual re-categorization.

#### DATA MANAGEMENT IN LOTMP PROGRAM

**Question #5:** What is an appropriate means of using existing data in the categorization process?

##### What the Public Says

The major concern expressed by the Public was that the Four Parties include all appropriate data in the categorization process.

- o The Four Parties should not become too conservative in its approach to data. Data should not be thrown out simply because it is "old".

On the other hand, the public felt that there should be some screening process for data.

- o The Four Parties should outline the quality control procedures for accepting data for categorization. These procedures should evaluate the "quality" of data. Although "good" data should be used regardless of source, data should be considered "guilty" until proven "innocent".

The public felt that even data that did not meet the quality control criteria for categorization could be put to good use.

- o If "poor" quality data suggests a potential toxics problem, the Four Parties should use this information as a catalyst to gather "good" quality data about the potential problem.

There was also some uncertainty over the definitions and functions of the terms "lakewide" and "ambient."

- o The Four Parties needs to clarify what is meant by "lakewide categorization" and "ambient."

- o The LOTMP should help solve local problems before they become "lakewide". Simply referring local problems to the RAPs is not sufficient.

### Response

Questions of data use and the appropriateness of data in the LOTMP revolve around two issues:

- o Are the data in question representative of "lakewide" or "local" conditions, and
- o Were the data collected under adequate quality assurance and quality control conditions to justify their use in driving LOTMP programs.

These issues are of importance since the LOTMP is directed at toxic problems found throughout the open waters of the lake. Although the definition of open water includes nearshore areas and embayments, toxic problems found in only one or a few such areas might not be considered lake-wide problems. Such local problems are the focus of the Areas of Concern and subject to Remedial Action Plans. The Four Parties, through the LOTMP, work closely with the RAPs on such AOCs. It is anticipated that the RAPs will be able to provide loadings estimates from each AOC to the lake so that the relative importance of each AOC to lakewide ambient problems can be assessed. Although the LOTMP does not lead RAP activities, the Four Parties expect this cooperative effort to continue. If problems that had been primarily handled through the RAPs take on lakewide dimensions, they would be incorporated into the LOTMP.

*On the need to use only "good quality" data . . .*

The Four Parties are concerned that only data with adequate quality control and quality assurance be incorporated into LOTMP programs. The primary current use of lakewide data is to drive the categorization process. This process uses existing data to conclude whether a toxic chemical exceeds a Four Party standard or criteria. Such chemicals are then subject to regulatory and control efforts. Before such major efforts are undertaken, the Four Parties will ensure that data support the results.

Question #6 Is there a benefit to using a mass balance model for proposing load reductions?

What the Public Says

The public was concerned about the usefulness of the mass balance approach.

- o Will the mass balance approach provide a less arbitrary basis on which to set standards?"
- o The Four Parties can use loadings data effectively without relying on modelling. The resource used on the mass balance model would be better spent on end-of-pipe monitoring, permitting, and pollution prevention.

Those that supported the mass balance effort had concerns about how the results would be applied.

- o The mass balance work is needed, but the Four Parties needs to explain the end use of the results.
- o How will the model account for toxics in sediments?
- o How accurate are the loadings estimates used in the model?
- o Continual modelling should not be a substitute for firm decision-making.
- o How accurate will model results be?
- o How will air toxics monitoring be incorporated into the model?
- o How would toxics from nonpoint sources be estimated and how would they be incorporated in the model?

### **Response**

The goal of the LOTMP is a lake that provides drinking water and fish that are safe for unlimited human consumption, and that allows natural reproduction, within the ecosystem, of the most sensitive native species. The plan achieves this goal through four objectives:

- o reductions in toxics through existing programs
- o reductions in toxics in special areas of concern
- o further reductions in toxics driven by lake-wide analyses of pollutant fate, and
- o zero discharge of toxics.

The current measure of plan success is whether concentrations of individual toxics exceed existing, Four Party, ambient fish tissue or water column standards and criteria in the lake. This is an interim step towards zero discharge of toxics.

The mass balance model can be used to answer the following key management questions concerning the LOTMP:

- o Assuming zero discharge, when will consumption of fish from the lake reach one of the acceptable risk levels?
- o With the level of discharges that are currently known, such as the Niagara River loads, when, if ever, would the lake system achieve an acceptable risk level?

Even without utilizing the mass balance model, we can also answer general questions concerning trends in discharges of toxics and ambient levels in the lake by taking advantage of existing monitoring not associated with the LOTMP. We may find, for example, that upon repeating the categorization process, some toxics no longer exceed applicable standards. This would be a good indication that loads were declining. There are other ongoing sampling programs that we could use in a similar fashion.

This assumes, of course, that toxic loads will eventually be low enough to achieve an acceptable risk level. This leads to the key question:

- o Given the current (or any known or proposed) level of toxic loads, will the lake system ever achieve one of the acceptable risk levels?

The mass balance model is needed to answer this question, and it is impossible to use the model to answer this question without monitoring the actual loads. A review of Table III-9 from the LOTMP demonstrates the current level of knowledge of Lake Ontario loads for toxics that exceed a standard or criteria. The table shows nine general discharge sources that contribute to the total toxic load in the lake. None of the toxics have reliable loading estimates for more than five of these source categories. Improving this loadings matrix is a high priority for the Four Parties.

With adequate loadings data the mass balance model will enable the Four Parties to:

1. determine whether current loads will achieve an acceptable risk level, and be able to differentiate among risk levels.
2. determine the amount of load reduction (allocated by source category from Table III-9) needed to achieve an acceptable risk level.
3. when loads from specific sources, for example, treatment plants, are known, what effect reductions would have on achieving standards in the lake.

The mass balance model, modelling the fate of toxics in water column, fish tissue, and sediments, along with improved loadings estimates will provide an important tool for Four Party LOTMP decisions.

#### **INSTITUTIONAL MANAGEMENT**

**Question #7:** What should be the relationship between the LOTMP and the RAPS?

#### **What the public says**

The public was very concerned that the New York State RAPS were not making sufficient progress and urged the Four Parties to take a more direct role in supporting the RAPS.

- o The RAPS need an infusion of energy and funds. The New York RAPS process is currently bogged down, and the LOTMP may not be able to depend on the RAPS for input. The Four Parties needs to find ways to support the RAPS, since success of the RAPS is vital for the ultimate success of the LOTMP.

There were several suggestions on specific ways the Four Parties could assist the RAPS.

- o The Four Parties should interact with the RAPS more, and provide some oversight as to their progress. Any Lakewide Advisory Committee should include representatives from the RAPS.
- o The RAPS and the LOTMP should use the same framework. The Four Parties should provide specific information to the RAPS on their importance to the LOTMP. One way to accomplish this might be through regular reports to the RAPS on LOTMP progress.

#### **Response**

Although implementation of the RAPS for the AOCs continues to be the responsibility of the state and provincial governments, the Four Parties place a high priority on their success. The Secretariat carries out ongoing liaison with RAP Coordinators, emphasizing the importance of the RAPS to the LOTMP. Should the Four Parties establish a Lakewide Advisory Council in association with turning the LOTMP into a Lakewide Advisory Plan (LAMP), representation from the RAPS would be very important. In addition, the Secretariat has provided, and will continue to provide, briefings to RAP public and citizen advisory councils on the LOTMP process.

Several new initiatives are underway to promote U.S. RAP activity. Under the Great Lakes Critical Programs Act of 1990, all RAPs are to be submitted to the International Joint Commission (IJC) by January 1, 1992. For all new AOCs, the Act mandates that the responsible state agency submit a RAP to EPA within two years of AOC designation, and then to the IJC within an additional six months.

To help achieve these goals, the U.S. Congress appropriated additional funds to EPA in fiscal year 91. Some of these funds will be applied to Lake Ontario RAPs. In addition EPA and the states implementing RAPs are meeting to discuss, among other items, how the public role in the RAP process can be enhanced.

Question #8      How do you feel about the key elements of public involvement in the LOTMP?

#### **What the public says**

Public comment focussed on three areas:

- the form of the public workshops,
- public participation in the technical committees, and
- the structure and content of the update document.

The public was aware of the difficulty in planning a workshop to meet all their needs and had several suggestions.

- o Weekend or daytime meetings may be necessary to bring in a broader cross section of the public. Different sessions may need to be scheduled to meet the needs and interests of all groups: agency staff, professionals, citizen activists, and interested lay public.
- o The workshops should continue to be rotated around the lake to make them available to the most people.
- o The U.S. and Canadian workshops should be held together rather than separately. Citizens on both sides of the border would benefit from hearing of their common problems and concerns.

Some members of the public felt that the Four Parties could give the public members of the technical committees some assistance in fulfilling their roles as full committee members.

- o Citizen members of technical committees don't always have access to materials and are not often in regular communication with other committee members. They need access to background materials that agency staff take for



granted. A bibliography should be developed by each committee for its members and the documents listed should be made available. Agency staff of the committees need greater sensitivity of the needs of the public to be fully involved in the committee process.

Finally there were some suggestions on improving communication and on the format of the LOTMP update.

- o The LOTMP update should be issued in a smaller, more digestible format. Some form of summary document should be available for those not prepared to read through the entire update.
- o The Four Parties should consider publishing a regular newsletter, and issue news releases when major events or new reports are issued.

Other comments on the public involvement process included:

- Establish a LOTMP advisory committee to assist in the public's learning needs and to provide continuity between workshops.
- Provide better funding for citizen members travel.
- Improve public education concerning the LOTMP.
- The LOTMP needs to communicate strategies to municipalities and other programs.
- The LOTMP needs to generate more media coverage.

### **Response**

The public involvement staffs of the Four Parties are evaluating suggestions in the areas of workshop location and timing, the advisability of Four Parties publishing a newsletter, resource

needs of citizen participants, public education, and other communication needs. It is the intent of the Four Parties to have workshops that, within the limits of available resources, are available to the broadest cross section of the interested public and agencies. As the LOTMP moves to a LAMP there will be a need to establish an entity that will serve the purpose of a "public advisory committee". In addition to the effort outlined above, the public involvement staffs are investigating the most appropriate structure of this entity in preparation for a recommendation to the Four Parties.

*On the role of citizen members of technical committees . . .*

The Four Parties prepared a guidance memo to technical committee chairs, members and correspondents on their roles and responsibilities, including communications. Some of the problems encountered by citizen members were probably attributable to start-up difficulties of the committees. With the publication of the guidance memo it is the intent of the Four Parties that private citizens be full and active members of each technical committee.

*On the need for an LOTMP summary document . . .*

The Four Parties will issue a summary document for the LOTMP with this update. The summary document is more inclusive than what is normally included in an executive summary and should provide the information of greatest interest concerning LOTMP status.

Question # 9 Are there any other LOTMP related issues that you wish to discuss or questions you wish to raise?

**What the public says**

- There was a call for a Toxics Management Plan for the St. Lawrence River as well as monitoring the St Lawrence.
- What are the procedures for handling emergency spills of toxics into the lake?

**Response**

*On a St. Lawrence River Toxics Management Plan . . .*

From time to time the issue of a TMP and associated monitoring on the St. Lawrence River has arisen during discussions between U.S. and Canadian agencies. There certainly is a need for a TMP for the St. Lawrence. Due to resource limitation, however, there are currently no immediate plans to undertake a St. Lawrence River TMP or establish a Four Party monitoring effort similar to that on the Niagara River.

*On the procedures for handling toxic spills . . .*

Vessels carrying hazardous substances on Lake Ontario account for a relatively small amount of the overall cargo traffic on the lake. This traffic still presents a serious potential for spill through groundings, collision, leakage, or unregulated discharges. Nearshore facilities and pipelines, as well as industries located along tributaries in the basin contribute to the potential threat of hazardous materials spills. Procedures are in place in Federal, State, and Provincial agencies for first, spill prevention, and second, spill response.

## **U.S. Federal Agencies**

### Coast Guard

- o The U.S. Coast Guard has jurisdiction over emergency response for spills occurring in navigable waters, including ports, the open waters of the lake, and navigable tributaries.
- o The Coast Guard has local spill response plans which adhere to guidelines set forth in the National and Regional Oil and Hazardous Substances Pollution Contingency Plans as well as state-wide Spill Response Guidance Manual.
- o The Coast Guard regulates and inspects vessels carrying hazardous materials in accordance with the Code of Federal Regulations. These regulations cover the transfer of hazardous materials at port, personnel training, transport and storage facilities and navigation equipment.
- o The Coast Guard conducts regular inspections of vessels and waterfront facilities to assure compliance with the regulations. The Coast Guard has the authority to prevent vessels that do not meet standards from leaving port, entering port, or transferring cargo.

### Environmental Protection Agency (EPA)

- o The U.S. EPA supports spill prevention through the Spill Prevention Containment and Countermeasure program (SPCC). The SPCC program has established under the Clean Water Act to facilitate inspection and enforcement activities for non-transport related facilities handling oil and petroleum products, particularly bulk storage tanks.
- o Title III of SARA requires facilities handling "extremely hazardous substances" to cooperate with state and local officials in preparing comprehensive release emergency plans.

## **New York State**

### NYS Emergency Management Office (SEMO)

- o NYS Hazardous Substance Bulk Storage Act regulates the sale, storage, and handling of hazardous substances to

prevent releases. It regulates tank registration, compliance with standards for construction, operation, maintenance, inspection and closure.

- o SEMO produces the NYS Hazardous Materials Emergency Contingency Plan. The plan provides operational guidance to state agencies to coordinate response to hazardous material emergencies.
- o SEMO coordinates emergency response at the State level and ensures the availability of a Regional Response Team where necessary. Three such RRTs are assigned to respond to events in Lake Ontario.

#### Department of Environmental Conservation (DEC)

- o DEC responds to spills through its regional offices' response staff.
- o DEC contributes to emergency preparedness by identifying critical wildlife areas where quick spill response is needed.

#### **Canadian Federal agencies**

##### Coast Guard

- o The Canadian Coast Guard works cooperatively with its United States counterpart in applying regulations and other measures aimed at protecting Lake Ontario from spills associated with shipping. As part of the Great Lakes Water Quality Agreement, joint Canada/U.S. Coast Guard oil spill exercises figure prominently in the application and development of a Joint Contingency Plan. Annual joint meetings between the two Coast Guards are held to review progress in meeting the objectives of the Great Lakes Water Quality Agreement.

##### Environment Canada

- o In the aftermath of the grounding of the Exxon Valdez, a Public Review Panel on Tanker Safety and Marine Spills Response Capability was established and held hearings across Canada. In November 1990, the Panel released its report, Protecting Our Waters. The Canadian Federal government set up an implementation team to review the recommendations of the report and to decide on an appropriate course of action. Under

Canada's Green Plan, the role and responsibilities of the Canadian Coast Guard in responding to spills will be more clearly defined and strengthened.

**Province of Ontario**

Ontario Ministry of the Environment

- o The Province of Ontario's Spill Contingency Plan provides a mechanism to deal with major spills under provincial jurisdiction and to assist the Coast Guard when requested. The ministry's primary role in spill incidents is that of a regulatory agency enforcing the duties and provisions imposed by the Ontario Environmental Protection Act. When notified of a spill, the Ministry will assist in warning "downstream" users or potentially affected parties and other agencies where applicable.