

SM
RECEIVED NOV 23 1994

November, 1994

Dear Interested Citizen:

The Four Parties participating in the Niagara River Toxics Management Plan (NRTMP); Environment Canada, U.S. Environmental Protection Agency, Ontario Ministry of Environment and Energy and New York State Department of Environmental Conservation have come to a pivotal point in the implementation of the plan. *We are interested in hearing your views* as we carefully evaluate progress made towards meeting the commitments made under the 1987 Niagara River Declaration of Intent.

The Four Parties are conducting a *public workshop on DECEMBER 8, 1994 to gather public insight, comments and suggestions about progress to-date, possible new commitments, and possible new approaches and objectives for continued work on the Niagara River.* The workshop will include open and small group discussions to allow for effective dialogue at this key decision-making stage. *We urge you to attend!*

Enclosed are the workshop announcement, a draft agenda and the Issues for Discussion document. The announcement provides you with necessary information to pre-register for and travel to the workshop. We are providing you with the Issues for Discussion document since it will be used to focus discussions during the workshop.

If you cannot attend the workshop, please take a few minutes to fill out the questions included at the end of the Issues for Discussion document. Once you have written your comments/suggestions, please tear the questions out of the document and return to one of the addresses below by *December 2, 1994.*

Mr. Mike Basile
USEPA Public Information Office
345 3rd Street
Suite 350
Niagara Falls, N.Y. 14303

Telephone: (716)285-8842
Fax: (716)285-8788

Mr. Rick Day
Niagara River Improvement Project
Ont. Ministry of Environment and Energy
P.O. Box 2112, 119 King St. W., 12th Fl.
Hamilton, ON L8N 3Z9 Canada

Telephone: (905)521-7641
Fax: (905)521-7820



Environment
Canada

Environnement
Canada



Ontario Ministry
of the Environment
and Energy



New York State
Department of
Environmental
Conservation

Draft Agenda NRTMP Workshop, Thursday, December 8, 1994

4:30-9:30 p.m.

**Ramada Suites, 7389 Lundy's Lane
Niagara Falls, Ontario, Canada**

- 4:30-5:30 Reception with light supper to meet the Niagara River Co-ordination Committee and Secretariat members, and technical staff
- 5:30-6:00 Introduction
1. Announce the availability of USEPA Waste Site Progress Report
 2. Review Process for the meeting
 3. Move into Small Groups
- 6:00-8:00 Group Discussions (work through Issues for Discussion)
- 8:00-8:10 **BREAK**
- 8:10-9:30 Plenary
1. Present reports from groups
 2. Share results from September Questionnaire
 3. Group discussion
 4. Closing remarks
- 9:30 Adjourn

You can help set the direction for future action on the Niagara River!

Express your views at a Workshop!

The Four Parties participating in the Niagara River Toxics Management Plan (NRTMP); Environment Canada, U.S. Environmental Protection Agency, Ontario Ministry of Environment and Energy and New York State Department of Environmental Conservation have come to a pivotal point in the implementation of the plan. We are carefully evaluating progress in meeting the commitments made under the Niagara River Declaration of Intent. We are also discussing possible new commitments, approaches and objectives for continued work on the Niagara River.

Thursday, December 8, 1994
4:30-5:30 p.m., Reception
5:30-9:30 p.m., Workshop

Ramada Suites, 7389 Lundy's Lane
Niagara Falls, Ontario, Canada

*This is a key decision-making stage.
You can help shape the NRTMP strategies for the Niagara River.
We urge you to attend this workshop.*

This workshop is sponsored by the Niagara Toxics Management Plan Co-ordination Committee, that consists of senior representatives from the Four Parties.

To pre-register please fill out the attached registration form and fax or mail to:

Mr. Mike Basile
USEPA Public Information Office
345 3rd Street
Suite 350
Niagara Falls, N.Y. 14303

Telephone: (716)285-8842
Fax: (716)285-8788

Mr. Rick Day
Niagara River Improvement Project
Ont. Ministry of Environment and Energy
P.O. Box 2112, 119 King St. W., 12th Fl.
Hamilton, ON L8N 3Z9 Canada

Telephone: (905)521-7641
Fax: (905)521-7820



Environment
Canada

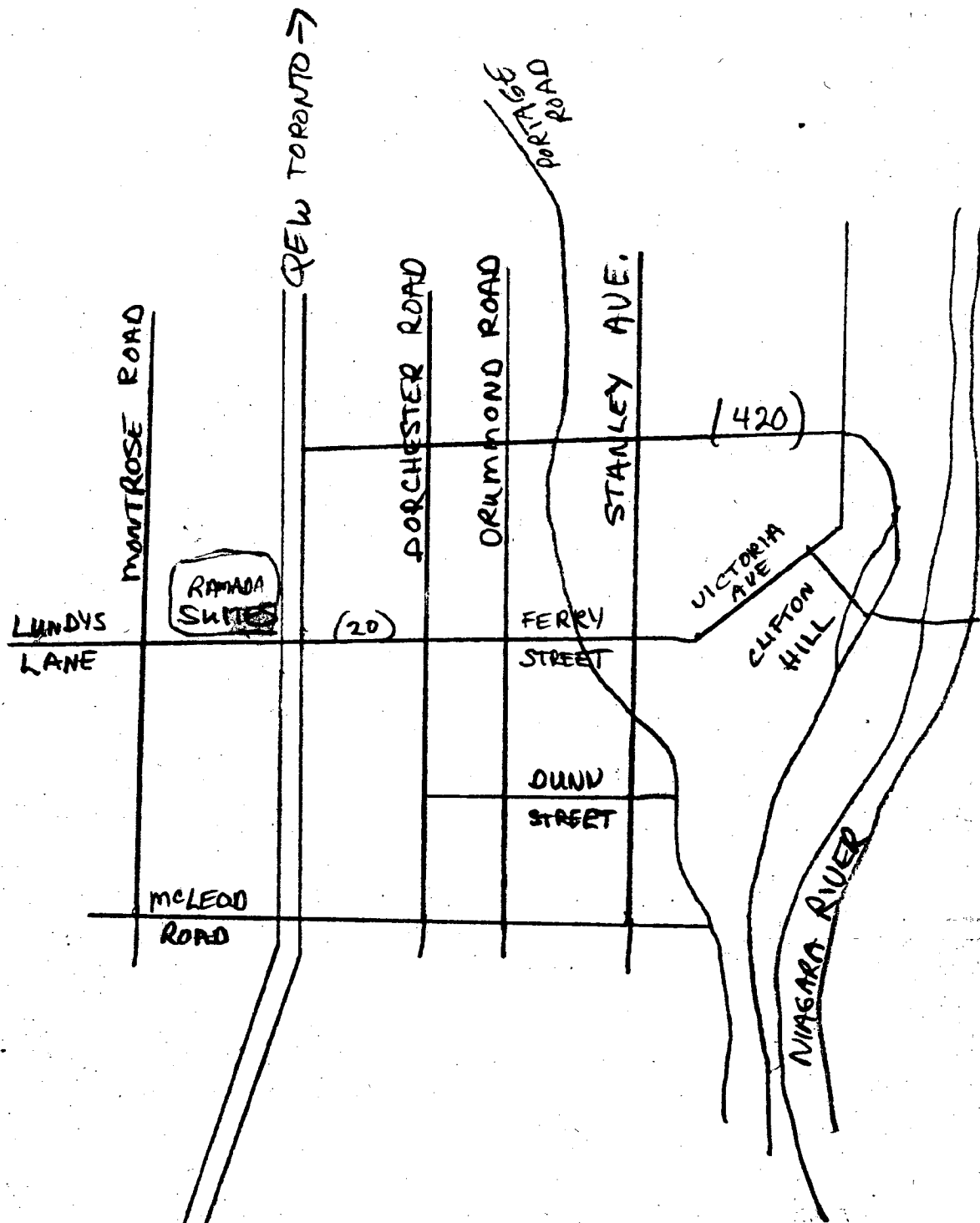
Environnement
Canada



Ontario Ministry
of the Environment
and Energy



New York State
Department of
Environmental
Conservation



↙ Q.E.W.
 BUFFALO

**From Toronto, Q.E.W.
 to exit HWY 20 Lundy's Lane.
 From Rainbow Bridge, Hwy
 420 to exit HWY 20 Lundy's Lane
 From Peace Bridge, Q.E.W.
 Niagara to exit HWY 20
 Lundy's Lane.**

REGISTRATION FORM

Yes! I would like to attend the Niagara River Toxics Management Plan Public Workshop!

To be held Thursday, December 8, 1994, 4:30-9:30 p.m. at Ramada Suites, 7389
Lundy's Lane, Niagara Falls, Ontario, Canada

NAME: _____

AFFILIATION (IF ANY): _____

ADDRESS: _____

TELEPHONE NO.: () _____

To pre-register for the workshop, please fax or mail a completed registration form by
December 2, 1994 to one of the contacts noted below:

Mr. Mike Basile
USEPA Public Information Office
345 3rd Street
Suite 350
Niagara Falls, N.Y. 14303

Telephone: (716)285-8842
Fax: (716)285-8788

Mr. Rick Day
Niagara River Improvement Project
Ont. Ministry of Environment and Energy
P.O. Box 2112, 119 King St. W., 12th Fl.
Hamilton, ON L8N 3Z9 Canada

Telephone: (905)521-7641
Fax: (905)521-7820

THE NIAGARA RIVER TOXICS MANAGEMENT PLAN

A SUMMARY and ISSUES FOR DISCUSSION

November 1994



Environment
Canada

Environnement
Canada



Ontario Ministry
of the Environment
and Energy



New York State
Department of
Environmental
Conservation

TABLE OF CONTENTS

1.	Introduction	1
	Background	1
2.	Summary of the Niagara River Toxics Management Plan	2
	Declaration of Intent	2
	A Summary of Progress To Date	2-3
	Challenges in Measuring Success/Progress	4
	New Ideas For Reporting Progress Through 1996	4
	New Considerations For Post 1996	5
	The Public Involvement Component	5
3.	Issues For Discussion	6-8

Appendix #1: A Report From The Technical Advisory Workgroup To The Niagara River Secretariat

The contents of this paper and the appendices are for discussion purposes only and may not reflect the current views or policies of the individual agencies or governments

INTRODUCTION

Background:

The Niagara River is a 37-mile (60 kilometer) channel that connects Lake Erie to Lake Ontario. Divided into upper and lower reaches by the Niagara Falls, the river provides 83% of the total tributary flow to Lake Ontario.

In 1987, the Four Parties (Environment Canada, U.S. Environmental Protection Agency, Ontario Ministry of Environment and Energy, and NYS Department of Environmental Conservation) signed a *Declaration of Intent* (DOI). The DOI, combined with a detailed Workplan, comprises the Niagara River Toxics Management Plan (NRTMP). The DOI outlines the principles to be followed in the accomplishment of a common goal: to reduce the loadings of toxic chemicals to the Niagara River through appropriate cooperative and independent agency activities. Through the DOI, the Four Parties also committed to: learning more about the Niagara River system; coordinating among the four agencies; and communicating progress to the public and jurisdictions.

In 1994, the Four Parties began a close examination of the status of the commitments made in the Niagara River DOI. During this examination, two specific issues were identified:

- the need to reach agreement on quantifying point and nonpoint source loadings;
- the recognition that there are limitations with existing data when demonstrating reductions of toxics loadings

The Four Parties are now consulting with the public in order to develop recommendations on how to communicate information associated with measuring progress under the NRTMP and how to proceed. The Summary and Issues For Discussion document has been prepared by the Four Parties to encourage your input.

The following summary of the Niagara River Toxics Management Plan identifies the subject areas on which the Four Parties are seeking public input. Those areas include:

- commitments made in the Declaration of Intent;
- progress made by the Four Parties to date;
- challenges in measuring progress;
- new ideas for reporting progress through 1996;
- new considerations for post 1996;
- the public involvement component of the NRTMP

This Issues For Discussion document and attached questions will be the focus of the December 8, 1994 public workshop. If you will not be able to attend, the questions provide you the opportunity to send written comments and suggestions that will be reviewed by the Four Parties.

SUMMARY OF THE NIAGARA RIVER TOXICS MANAGEMENT PLAN

The Niagara River Declaration of Intent:

The *Declaration of Intent* (DOI) enables the Four Parties to work in a directed and coordinated manner toward achieving significant reductions of toxic substances in the Niagara River by implementing a management strategy, timetables, and specific activities. The Four Parties have committed to using the authority provided by their domestic laws and regulations to achieve these reductions. The DOI is consistent with the goals of reducing toxic substances in the Great Lakes as agreed upon by the governments of the United States and Canada under the *1978 Water Quality Agreement*.

The DOI outlines eleven actions that would be undertaken by the Parties. Although all of these actions are significant, there has been a tendency to focus only on reducing, by at least 50%, persistent toxics loadings from point and nonpoint sources by 1996. The following is a summary of the actions outlined in the DOI using four specific categories:

- **Reduce toxic loadings** from point sources and nonpoint sources
- **Learn more about the Niagara River system** by examining upstream/downstream monitoring data and conducting technical and scientific research programs
- **Coordinate among the Four Parties** by establishing common methodologies, improving monitoring systems and maintaining an effective management structure
- **Communicate progress to the public and jurisdictions** by issuing status and progress reports, asking for public comments, and updating the NRTMP

For an original list of commitments please refer to the *1987 Declaration of Intent*. For a copy please contact Marna Gadoua at NYSDEC (518) 457-0669; or Rick Day at Ontario Ministry of Environment and Energy (905) 521-7641.

A Summary of Progress To Date:

Since 1987, the Four Parties have worked both together and individually to meet the commitments in the DOI. The following summary provides examples of activities that have been undertaken as a direct result of the DOI or that are achieving the commitments of the DOI as part of another program.

- **Reduced toxics loadings** to the Niagara River through:
 - a. Remediation of hazardous waste sites (and other toxic areas) and the implementation of programs to control point and nonpoint sources of toxics loadings into the river. Examples include:

- Removing contaminating sediments from the Welland River and Gill Creek
 - Treating contaminated groundwater discharged from the Falls Street Tunnel in Niagara Falls, NY
- b. **Implementing pollution prevention programs. Examples include:**
- Pollution Prevention Pledge Program includes commitments to reduce toxic chemicals and other pollutants; The Accelerated Reduction or Elimination of Toxics Program evaluates chemicals for bans or phase-outs
 - conducting multi-media facility inspections that attempt to evaluate discharges to all sectors of the environment (air, water, land)
- **Learned more about the Niagara River system** by conducting research and mass balance monitoring. Examples include:
 - monitoring ambient water quality at the headwaters and mouth of the Niagara River for more than 9 years using state-of-the-art sampling and analysis methods for measuring more than 70 substances
 - conducting biomonitoring programs
 - **Coordinated among the Four Parties** by establishing common methodologies for identifying, assessing and quantifying toxics loadings. Examples include:
 - developing and categorizing a master list of persistent toxic chemicals
 - **Communicated progress to the public and jurisdictions.** Examples include:
 - preparing and releasing annual updates and progress reports
 - preparing and releasing individual reports on studies and actions taken by each agency
 - consulting with the public on the extent of progress

For a comprehensive list of accomplishments of the Four Parties and the individual agencies, please contact Marna Gadoua at NYSDEC (518) 457-0669; or Rick Day at Ontario Ministry of Environment and Energy (905) 521-7641.

Challenges in Measuring Success/Progress:

The stated purpose of the 1987 *Declaration of Intent* is to achieve significant reductions of the toxics loadings to the Niagara River. Within this broad goal, the Four Parties also stated an objective of achieving a 50% reduction in the loadings of specific "chemicals of concern" from point and nonpoint sources. It was intended that existing data collection programs under the NRTMP would be used to measure the success of achieving this reduction.

However, it has become apparent that reporting (quantitatively) a 50% reduction from sources will not be possible because the existing data collection programs were not specifically designed to measure such a reduction and as a result have proven inadequate. Other challenges have been identified that make measuring a 50% reduction difficult. For example:

- not all chemicals of concern are measured at all point sources;
- undetected inputs may result from relatively high detection limits for some substances;
- there is a lack of a thoroughly descriptive quantification of loads for 1986 against which any reductions can be measured;
- groundwater transport of contaminants from waste sites to the river is not fully understood.

These difficulties have necessitated a re-examination of the NRTMP framework and the consideration of possible new approaches to measuring and reporting reductions of toxics loadings to the Niagara River.

New Ideas For Reporting Progress Through 1996:

The Four Parties are considering placing greater emphasis on demonstrating load reductions in ways other than just by using the 50% reduction objective. Other ways of measuring Four Party progress may include the following:

- measuring progress by broadening the chemical base to include all toxic chemicals, as stated in the DOI;
- showing, quantitatively where possible, how the actions that the Four Parties have already taken have reduced toxics loadings to the Niagara River;
- including the biomonitoring program as a commitment under the NRTMP along with the ambient, point source, and nonpoint source monitoring programs;
- conducting core sampling in the depositional zone of the Niagara River Delta and from two off-stream reservoirs; the samples could be compared to previous data.

New Considerations For Post 1996:

The Four Parties are re-examining the framework of the NRTMP and are considering amending the *Declaration Of Intent*. One idea being considered would include the following amendments:

- placing an emphasis on reducing inputs of all toxic chemicals to the Niagara River;
- indicating that the goals for the NRTMP should be consistent with achieving the toxic reduction strategies of the Lake Erie Lakewide Management Plan; the Lake Ontario Toxics Management Plan/Lakewide Management Plan; and the Niagara River Remedial Action Plans;
- integrating, more effectively, data collected from source and ambient monitoring;
- continuing source identification and monitoring efforts as well as making the efforts more definitive;
- designing and using biomonitoring programs to support the evaluation of the effectiveness of control programs as well as continuing the upstream/downstream monitoring program.

For details about the information summarized in the previous three sections, please see *Appendix #1 - A Report From The Technical Advisory Workgroup To The Niagara River Secretariat*.

The Public Involvement Component:

The goal of the public involvement component of the NRTMP has been to provide a forum for public consultation in efforts to achieve the goals of the NRTMP. To establish and maintain an effective public consultation process, the Four Parties organized a Public Involvement Committee. The NRTMP public involvement process has historically included several elements:

- conducting public workshops
- holding open public Coordination Committee meetings
- conducting outreach activities
- conducting public information/education activities
- including citizen members as active and corresponding members of the three technical committees

3. The summary section explains that the Four Parties have identified difficulties with measuring and reporting progress in meeting the commitments of the *Declaration of Intent*.

a) What are your ideas for overcoming the difficulties described in the **Challenges in Measuring Success/Progress** section of the summary?

b) What else do you think needs to be done between now and 1996 to meet the commitments in the *Declaration of Intent*?

4. As the summary section indicates, the Four Parties are currently discussing the need to amend the *Declaration of Intent* to reach beyond the 1996 commitments. We would like to better understand your ideas about the direction you'd like the Niagara River Toxics Management Plan to take.

a) What new goals, objectives, and/or commitments should be included in an amended *Declaration of Intent*?

b) What is your reaction to the ideas that are explained in the **New Considerations for Post 1996** section of the summary?

- c) What suggestions do you have for creating linkages to upstream/downstream and tributary environmental management programs such as the Lake Ontario Lakewide Management Plan, or to plans for the St. Lawrence River or Lake Erie?

5. The summary section highlights the public involvement component of the Niagara River Toxics Management Plan. Conducting public workshops, organizing public information/education activities, holding open Coordination Committee meetings and requesting comments on documents are the methods currently used to provide information and/or seek public input.

- a) How effective are these public involvement activities? What other activities would be valuable to you?

- b) What suggestions do you have for improving or expanding the public involvement process for the Niagara River Toxics Management Plan?

- c) Please indicate how we could communicate most effectively with you (or your constituents).

**A Report From The Technical Advisory
Workgroup To the Niagara River Secretariat**

A Discussion Document by:

R. Draper
New York State Department of Environmental
Conservation

R. Hemmett
United States Environmental Protection Agency

A. McLarty
Ontario Ministry of Environment and Energy

D. Williams
Environment Canada

NOVEMBER 1994

1. Challenges in Measuring Success/Progress

The Declaration of Intent stated purpose is to **achieve significant reductions of toxic chemical pollutants in the Niagara River**. Within this broad goal, was a specific sub-objective of achieving a 50% reduction in the loadings of specific "chemicals of concern" from both point and nonpoint sources, by 1996. Eighteen "priority toxics" were identified by the Four Parties in the Niagara River Toxics Management Plan (NRTMP), ten of which, because they were deemed to have significant Niagara River sources, were designated for 50% reduction (Table 1, page 7). The intent of the specification of a 50% reduction was to ensure that reduction efforts would proceed in a timely fashion.

It was intended that existing data collection programs (i.e., point source, nonpoint source and upstream/downstream components) of the Plan would be used to measure the success of achieving this 50% loading reduction sub-objective. It has become apparent, however, that reporting quantitatively on the 50% loading reduction from sources will not be possible because the above programs were not specifically designed to measure this as pointed out in the 1993 Progress Report (NRTMP 1993), and as a result, have proven to be inadequate.

The following, briefly outlines why quantifying the 50% reduction will not be possible, for the point source, nonpoint source, and ambient components.

Point Sources

Direct measurements of daily point source loadings have been made relative to Ontario and New York discharges, at various levels of intensity, from once per year to once per month. When attempting to demonstrate progress since 1986, considerable uncertainty is introduced by the extrapolation from daily to annual loadings. Although estimates of point source loadings have been made, these estimates are not statistically valid for demonstrating the 50% reduction in annual loads between 1986 and 1996. Some of the inherent difficulties in determining a statistically valid estimate of the loads are:

- not all substances of concern are measured at all point sources; some are not measured at all;
- detection limits are high so that a potential load, estimated for substances below quantitative detection levels, may be more significant than the measurable load for those substances;
- detection limits, sampling protocols, and methods of estimating loads used by Canadian and United States' agencies are different and have changed over time;

- there is a lack of a thoroughly descriptive quantification of loadings in 1986, against which any reductions could be measured.

Nonpoint Sources

The nonpoint source focus of the NRTMP has been, generally, linked to off-site contamination from hazardous waste sites. Estimates of potential nonpoint source loadings to the Niagara River, have also been made. These estimates are not statistically valid for demonstrating the 50% reduction in annual loads between 1986 and 1996. Some of the inherent difficulties in determining a good estimate of the loads are:

- much of the loading data from waste sites is not chemical specific; therefore, no loadings estimates are available for the ten chemicals scheduled for 50% reduction;
- the uncertainty in the estimates of loads from waste sites are orders of magnitude greater than that for loads from point sources. There are a number of reasons for this uncertainty, including:
 - o a lack of specificity related to groundwater flow and groundwater transport of contaminants from waste sites to the river;
 - o the use of Total Organic Halogens (TOX) in lieu of chemical specific data; and
 - o a lack of consideration of non-aqueous phase liquid (NAPL) contaminants or bedrock flow, in current estimates.
- there is a lack of a thoroughly descriptive quantification of loadings in 1986, against which any reductions could be measured.

With respect to tributary loadings, there are no baseline loading data for tributaries against which to compare reductions.

Ambient (Upstream/Downstream)

Of the ten chemicals designated for 50% reduction, the upstream/downstream river monitoring program cannot be used to report on reductions for five contaminants for the following reasons:

- benzo(b)- and benzo(k)fluoranthene cannot be distinguished from each other analytically and cannot, therefore be reported on separately;
- dioxin has never been detected in water or suspended sediments at pg/L detection levels;
- mercury is at or below the detection limit;

- tetrachloroethylene (TCE) was found in 1986 and 87 but not since; the level observed in 1986 led to its identification as a substance for 50% reduction (list of 10); after a number of years of finding no detectable amounts, analysis for all volatiles, such as TCE, was discontinued in 1993.

With respect to the additional chemicals, there are the following limitations:

- there are no data for toxaphene due to the lack of an appropriate analytical method;
- chrysene is analytically indistinguishable from triphenylene;
- DDT and metabolites show negative differential load;
- dieldrin and chlordane may exhibit similar problems to DDT in interpreting data.

The upstream/downstream program, therefore, will be useful to report on, perhaps, only eight of the eighteen priority toxics.

All the difficulties identified in the above program components have necessitated a re-examination of the NRTMP framework including alternative ways of measuring and communicating progress toward meeting the Declaration of Intent between now and 1996 and, where we should be going after 1996. These are discussed in the next sections of this report.

2. New Ideas for Reporting Progress through 1996

1996 has arisen from the Declaration of Intent as a significant milestone only in the context of the 50% reduction of persistent toxic chemicals of concern from point and nonpoint sources to the Niagara River. One idea is to place less focus on the sub-objective of a quantitative reduction in loadings of the 10 chemicals of concern from point and non-point sources by 50%. Greater emphasis would be devoted to demonstrating progress in other ways. However, this shift away from the 50% quantitative sub-objective should not be interpreted as backing away from commitments made in the NRTMP. It is simply a recognition that existing programs will not be able to be used to determine this reduction for the reasons stated above and as identified in the 1993 progress report (NRTMP 1993). Quantitative data would be utilized where available and valid not only for the NRTMP chemicals of concern, but for all toxic chemicals. This is consistent with the overall goal of the Declaration of Intent. There is a need to relate, more effectively, data on control measures and remedial activities (sources), with information on environmental conditions in the Niagara River (ambient), such as upstream/downstream and biomonitoring data.

A new way of measuring Four Party progress in reducing toxic inputs to the Niagara River Ecosystem (including the 10 chemicals of concern) includes the following activities:

A. Broaden the chemical base upon which progress is measured to include all toxic chemicals as stated in the 1987 Declaration of Intent so that:

- Chemicals which are already part of the upstream/downstream program and monitored for at point and nonpoint sources can be used to track progress.

- Current activities interpreting existing data (ambient, biomonitoring, point source, and nonpoint source), which are anticipated to show trends and possibly reductions for these chemicals can also be used to track progress.

B. Show how the actions that have been taken by the Four Parties have reduced toxic inputs to the Niagara River by:

- Using point source, nonpoint source, ambient (upstream/downstream), and biomonitoring data to show that reductions of toxic loadings have occurred.

C. Include biomonitoring as a commitment under the NRTMP as are the ambient, point source, nonpoint source programs because:

- Biomonitoring can provide information on contaminants that would otherwise be undetected.

- Biomonitoring activities have been an integral part of the Niagara River monitoring program for many years but have never been recognized as a formal part of the NRTMP.

D. Conduct core sampling in the depositional areas of the Niagara River and the two off-stream reservoirs (Sir Adam Beck and Robert Moses) because:

- Pre-NRTMP baseline conditions in the Niagara River depositional zone have been documented by a study completed in the early 80's by Environment Canada's National Water Research Institute (see Mudroch, 1983) and are available for comparison.

- Similar information is available for the reservoirs (see Breteler et al, 1984; Kauss and Post, 1987).

- New cores could be sectioned and compared to previous data to document changes in contaminant deposition (history, rate, spacial distribution and trends) from 1986 to 1996.

3. New considerations for post 1996

The Four Parties are re-examining the NRTMP framework and considering possible new approaches for amending the Declaration of Intent after 1996. An idea being considered is proposing to expand the goal statement of the DOI to include the following:

- That inputs of all toxic chemicals to the Niagara River are to be reduced, and;
- That the goals for the NRTMP should be consistent with achieving the toxic reduction strategies of the Lake Erie LaMP, the Lake Ontario Toxics Management/LaMP Plan, and the Niagara River RAPs.

These objectives consider continued reduction of toxic inputs to the Niagara River as necessary to achieve some desirable future state in the river. The attributes of that future state would be determined by public demand and would require the Four Parties to identify and define measurable endpoints. Linkages to upstream and downstream environmental management programs in Lakes Erie and Ontario, as well as in tributary areas are necessary to ensure achievement of common goals.

It is recognized that in order to effectively improve environmental conditions, source identification and monitoring efforts must continue and must become more definitive. To link cause and effect, in terms of remediation action and associated benefits, the Four Parties will need a closer integration of source and ambient data.

Some of the changes to the monitoring activities of the Four Parties that would support the new approach include:

- Identifying source-specific chemical markers, which could be definitively related to a particular source when detected in the environment. Remedial measures could then be targeted at that source to effect improvements in the environment.
- Continuing the present upstream/downstream monitoring program. Analysis and interpretation of upstream/downstream data should be reviewed to provide a stronger explanation in terms of actions taken at sources (trend analysis, spikes, reductions, etc.).
- Designing and using biomonitoring programs to support the evaluation of the effectiveness of control programs.
- Implementing a variety of track-down techniques, including biomonitoring, for the identification of new sources. Samplers could be deployed, for example, within the

collection systems of POTWs (Publicly Operated Treatment Works), in tributary streams, or surrounding waste sites. Due to the bio-magnification of some substances, tissue analysis of biotic indicators can reveal the presence of even low-level contamination.

- Continuing periodic monitoring of the depositional zone of the Niagara River, by collecting and analyzing sediment cores.
- Establishing a Four Party process to define specific activities to be undertaken, to determine their associated costs and benefits, and establish to priorities for implementation.

REFERENCES

- Breteler, R.J., V.T. Bowen, D.L. Schneider and R. Henderson. 1984. Sedimentological reconstruction of the recent pattern of mercury pollution in the Niagara River. Environ. Sci. Technol. 18(6): 404-409.
- Kauss, P.B. and L.E. Post. 1987. Contaminant Concentration In Bottom Sediments of the Sir Adam Beck Power Reservoir and Niagara River Bar Dredgeate. Great Lakes section, Water Resources Branch, Ontario Ministry of the Environment.
- Mudroch, A. 1983. Distribution of major elements and metals in sediment cores from the Western basin of Lake Ontario. J. great Lakes Res. 9(2): 125-133.
- NRTMP. 1993. Report by the Niagara River Ad Hoc Workgroup. Niagara River Ad Hoc Workgroup. Environment Canada, United States Environmental Protection Agency, Ontario Ministry of the Environment, and New York State Department of Environmental Conservation. January 1993.

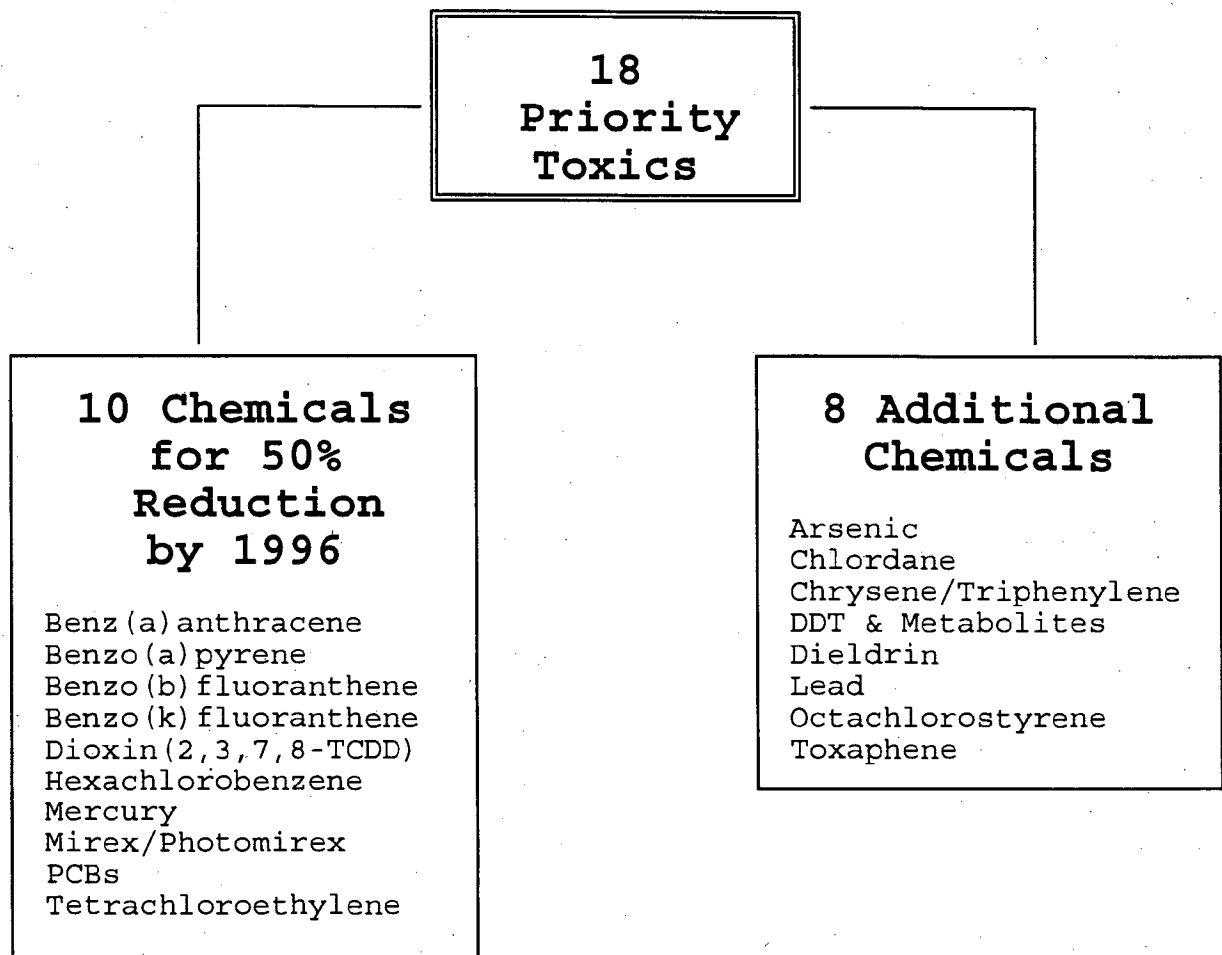


TABLE 1 Eighteen Priority Toxics for the NRTMP.