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UNITED STATES RESPONSE  
TO THE  
INTERNATIONAL JOINT COMMISSION'S  
SEVENTH BIENNIAL REPORT ON  
GREAT LAKES WATER QUALITY



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# INTERNATIONAL JOINT COMMISSION'S SEVENTH BIENNIAL REPORT

## INTRODUCTION

The International Joint Commission (the Commission) has played a unique and important role in assisting the United States and Canada in the pursuit of their mutual objectives under the Great Lakes Water Quality Agreement (GLWQA). The Commission has monitored progress, facilitated important dialogue on key issues, and encouraged the two countries to move forward in their implementation of a joint environmental agenda for this magnificent resource. The work of the U.S., Canada, and the Commission together is proving, in many respects, to be a model for international coordination and cooperation, and a proving ground for the important work of translating the theory of ecosystem protection into practice.

The progress of the U.S. in restoring and protecting the Great Lakes ecosystem has been well documented in recent reports to both the Commission<sup>1</sup> and to the U.S. Congress<sup>2</sup>. The purpose of this document is not to repeat a litany of past successes, though there have been many, but to look forward to the considerable challenges and opportunities that lie ahead. As the U.S. and Canada move forward together to confront these challenges and pursue these opportunities, undertaking actions to protect the Great Lakes in a manner that ensures the sustainability of its resources and allows for the continued prosperity of its people, it is important to reaffirm the guiding principles that serve as the foundation of the two nations' efforts:

- the commitment to undertake actions that embody a systematic and comprehensive ecosystem approach to managing the resources of the Great Lakes basin;
- the commitment to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes basin ecosystem;
- the policy that the discharge of toxic substances in toxic amounts be prohibited; and
- the policy that the discharge of persistent toxic substances be virtually eliminated.

In looking to the future, the U.S. actions will continue to be guided by the Great Lakes 5-

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<sup>1</sup> October, 1993 Great Lakes Program Progress Report (EPA 905-R-93-003).

<sup>2</sup> February, 1994 Report to Congress on the Great Lakes Ecosystem (EPA 905-R-94-004).

Year Strategic Plan<sup>3</sup>. This Plan focuses Federal and State efforts in three specific ways:

- (1) the reduction of the level of toxic substances in the Great Lakes basin, including terrestrial and aquatic habitats; with an emphasis on reducing persistent toxic substances, so that all organisms are adequately protected and the substances are virtually eliminated from the Great Lakes ecosystem;
- (2) the protection and restoration of habitats vital for the support of healthy and diverse communities of plants, fish, and wildlife, with an emphasis on fish and wildlife habitats, wetland habitats, and those habitats needed by threatened and endangered species; and
- (3) the protection of human and ecological health by restoring and maintaining stable, diverse, and self-sustaining populations of fish and other aquatic organisms, wildlife, and plants.

In 1995, the U.S. will begin a process to update the Great Lakes 5-Year Strategy, seeking to: improve and solidify the Federal, State, and Tribal partnerships needed to implement the Strategy; continue to foster creative public-private partnerships to achieve our environmental goals; expand the public constituency supporting protection and restoration efforts; commit to measurable environmental objectives and key milestones to evaluate progress; and improve binational coordination under the GLWQA and with Canada's actions under the Canada-Ontario Agreement (COA).

In addition, the USEPA will publish the final Great Lakes Water Quality Guidance in 1995, which will describe how the Great Lakes States and Indian Tribes will adopt consistent, Great Lakes-specific water quality criteria and implementation procedures, and antidegradation procedures, in their water quality standards. The water quality criteria will apply to all pollutants, regardless of their source. At the same time, USEPA recognizes that non-point sources, including air deposition, contaminated sediments, urban and rural runoff, and spills, contribute significant loadings of toxic pollutants to the Great Lakes. To address these non-point sources, USEPA is implementing the Great Lakes Toxic Reduction Effort. This is a collaborative effort among the Great Lakes States, Tribes, local governments, and public stakeholders across the Great Lakes basin. The goal is to prevent and achieve additional reductions in the generation and release of persistent, bioaccumulative toxic pollutants from non-point sources, in order to protect human health, aquatic life, and wildlife.

Sediment contamination in Great Lakes Areas of Concern (AOCs) can serve as an example of the need to address non-point sources that are a major source of toxic loadings. Due to the

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<sup>3</sup>A Joint Federal/State 5-Year Strategy (1992-1997). Protecting the Great Lakes: Our Environmental Goals and How We Plan to Achieve Them. April 1992.

widespread sediment contamination problem in the Great Lakes, there is a need to accelerate the rate at which actual cleanups are achieved. Significant efforts are underway to develop sound, scientific environmental information on the AOCs, and to use regulatory tools and non-regulatory tools to bring about sediment remediation. While our knowledge has greatly expanded in recent years, as yet only a fraction of the Areas of Concern have been assessed and have initiated actual sediment remediation. As a part of our efforts to reduce toxics in the Great Lakes, the U.S. is committed to reaching solutions to the sediment problem so remediation can take place in Areas of Concern as quickly as possible.

In addition, existing statutory and programmatic authorities are being targeted to prevent and control nonpoint sources of toxic pollutants. These include: the Clean Air Act; the Resource Conservation and Recovery Act; the Comprehensive Environmental Response and Compensation Liability Act; the Toxic Substances Control Act. In a manner determined by the governing statute, each of these programs will use the final Great Lakes water quality criteria, adopted into state standards, as the benchmark that determines appropriate levels of control.

In moving forward, the U.S. will continue to emphasize the important work of Federal, State, and Tribal actions to restore beneficial uses at the local level, particularly within the Areas of Concern, and at the lakewide level through the Lakewide Management Plans (LaMPs).

In its 7th Biennial Report, the Commission again noted the widespread and pernicious effects of persistent, bioaccumulative toxic substances on the biota of the Great Lakes ecosystem, and the potential threats these types of chemicals pose to humans, particularly to those who depend on these resources for sustenance or recreation.

The U.S. will continue to address the ongoing or future threats of these chemical agents by reducing and, where possible, eliminating the releases of these substances from all sources. In carrying out this policy, the U.S. will adhere to the prevention hierarchy established by Congress:

- preventing or reducing the use of these substances at the source as a first choice;
- recycling these substances in a manner that eliminates all environmental releases;
- treating these substances to eliminate environmental releases; and
- disposing of these substances in an environmentally safe manner only as a last resort.

Furthermore, the USEPA and Environment Canada have agreed to pursue the development of a binational strategy to reduce and eliminate, where possible, the use and incidental release of persistent, bioaccumulative, human-produced toxic chemicals. This strategy will provide a common foundation (i.e., goals, quantifiable objectives, measures of progress) for both countries as they enhance domestic programs that are underway, share information, and

initiate joint efforts. *Prevention* will be the preferred means to achieve the elimination of uses and releases.

As this joint strategy is implemented, the two countries will work together in the international arena to advance the need for eliminating the release of persistent, bioaccumulative, toxic substances which result from human activity. The integrity of the Great Lakes ecosystem can only truly be restored and protected if the complex problems are understood and solutions are pursued within a regional and global context by the appropriate jurisdictions and stakeholders.

In stating its recommendations in the 7th Biennial Report on Great Lakes Water Quality, the Commission renews its call for joint and compatible actions at the international, national, regional and local levels. The Commission provides recommendations to the Federal and State/Provincial governments, but also to the business community, labor, and the media. The attached responses address those recommendations directed to the Federal and State governments and reflects the views and inputs of a wide range of Federal and State agencies. In addition, the U.S. and Canada have worked closely on the development of their respective responses, particularly where those recommendations relate to areas of binational activity, such as the Lake Superior Binational Program, Great Lakes reporting and a binational virtual elimination strategy. While the release of the Canadian and U.S. responses were not coincident, the Commission should find that our positions are largely consistent.

## United States Response to Recommendations in the International Joint Commission's 7th Biennial Report

*1. The Commission formally emphasizes and confirms the recommendations of its Fifth and Sixth Biennial Reports on Great Lakes Water Quality, issued in 1990 and 1992, respectively.*

The U.S. has responded favorably and is pursuing, or has completed, many courses of action recommended by the Commission. Activities and programs have been initiated or are underway that support the achievement of these recommendations. For example, the development of a program to protect and restore Lake Superior, and the launching of a "Virtual Elimination" project, directly support and were in response to Commission recommendations. In addition, the U.S. is also pursuing many approaches recommended in the Commission's Seventh Report.

*2. The Commission also reiterates its recommendation concerning incinerators in the Report on Air Quality in the Detroit-Windsor/Port Huron-Sarnia Region:*

*A. Incineration facilities in the region be phased out of use or required to eliminate the production and emission of dioxins, furans, PCBs, and inorganic materials, especially mercury and hydrochloric acid.*

The U.S. partially supports this recommendation. The U.S. views incineration as a necessary part of its comprehensive hazardous waste management approach that gives foremost priority to pollution prevention and secondary priority to recycling. The U.S. believes that an incineration facility, equipped with the maximum achievable control technology and operated under the proper conditions, can be an integral component of a comprehensive waste management system, under which prime consideration is first given to waste reduction, followed by reuse and recycling. In addition, lessening dependence on incineration will require research into alternate disposal methods.

At the same time, the Federal Government agrees with the Commission that emission of the above mentioned chemicals should be reduced as much as possible, or eliminated when feasible and practicable. According to USEPA's recent Dioxin Reassessment, approximately 90 per cent of new emissions of dioxins in the U.S. come from incineration. Incinerators are also leading emitters of mercury, a bioaccumulative toxicant which triggers fish consumption advisories across the U.S. and which is principally distributed via the atmosphere. Dramatic reductions in incinerator emissions are feasible and will be phased in across the U.S. during the next four years. To ensure that incineration is as safe as possible, and that emissions are

reduced to the lowest possible levels, the following key initiatives are being undertaken to strengthen environmental policies, standards, and controls.

### ***Municipal Waste Incineration***

In September 1994, USEPA proposed technology-based Municipal Waste Combustion performance requirements, for both new and existing municipal waste incinerators. About 180 existing municipal incinerators dispose of 17 percent of this nation's trash. The proposed rule will be finalized by September 1995; existing municipal plants will thereafter have one to three years to install new pollution control equipment and to meet performance standards. The proposal requires compliance with operator training and certification requirements within one year of promulgation. New plants must comply upon start of operations.

USEPA anticipates that implementation of the proposed guidelines will dramatically reduce emissions from existing municipal waste incinerators. Nationwide municipal emissions of dioxins/furans would be reduced by 99 percent; municipal emissions of mercury would be reduced 78 percent; lead emissions by 76 percent; and cadmium emissions by 73 percent. Additionally, the proposed guidelines would reduce nationwide municipal emissions of sulphur-dioxide by 82 percent; nitrogen-oxide by 32 percent; and particulate matter by 48 percent. The proposed guidelines include an accelerated compliance schedule for dioxin and mercury emissions from certain municipal incinerators. And the proposed rule will establish testing and monitoring requirements for municipal emissions of various organics, metals, and acid gases.

The proposed rule also sets requirements for new municipal incinerators, pertaining to siting, operator training and certification, and testing and monitoring. The proposed emission reductions for new municipal incinerators include an 81 percent reduction in lead emissions from existing standards for new incinerators, a 72 percent emission reduction for mercury, and a 33 percent emission reduction for dioxins and furans, among various pollutants.

### ***Medical Waste Incineration***

During 1995, USEPA will propose similar rules to control emissions from medical waste incinerators that are found in hospitals, veterinarian offices, and nursing homes. There are more than 5,000 medical waste incinerators in the U.S. and collectively they are estimated to be the largest overall source of known national emissions of dioxin; they are also a leading source of known national emissions of mercury. USEPA will propose emission standards for particulates, lead, mercury, dioxins, and opacity, among various parameters. The Agency anticipates finalizing the rule by April 1996. Once finalized, States will develop plans to incorporate the new rules into their regulatory programs.

### ***Hazardous Waste Incinerators***

In May 1993, USEPA announced a major overhaul of Federal rules governing hazardous

waste combustion. The Draft Waste Minimization and Combustion Strategy emphasizes the heightened awareness and importance given to source reduction and recycling as waste management techniques and is designed to reduce the amount of hazardous waste generated in this country. It includes a national review of the relative roles of waste reduction and waste combustion in hazardous waste management, and the inclusion of source reduction in permitting activities and as Supplemental Environmental Projects in enforcement settlements. The U.S. is committed to source reduction as our first and primary approach to waste management.

Under the Resource Conservation and Recovery Act (RCRA), USEPA and authorized States regulate both Boilers and Industrial Furnaces (BIFs) and hazardous waste incinerators. The revised policy incorporates full, multiple-route risk assessments in permitting incinerators and BIFs, requiring extensive analysis of emissions to estimate human exposure from both direct pathways (inhalation) and indirect pathways (soil and food ingestion) before any new permit is issued. Emphasis will be placed on bringing all existing interim status hazardous waste incinerators and BIFs under USEPA's permitting standards.

Compounds that will be analyzed and used in risk assessments include carcinogenic (e.g., arsenic, cadmium, chromium) and non-carcinogenic metals (e.g., lead, mercury, selenium), hydrochloric acid, chlorine gas, and 213 organic compounds as products of incomplete combustion (PICs).

Analyses of PICs will include full substituted dibenzo-p-dioxin and dibenzofuran analyses and a full PCB scan. The Strategy also recommends sampling and analysis of highly toxic compounds that will be in the trial burn waste in high concentrations. Trial burn wastes will be formulated to yield characteristic emissions so that protective permit terms can be ensured.

The U.S. considers that these requirements will significantly reduce the emission of dioxins, furans, PCBs, and inorganic materials from hazardous waste incinerators. In addition, no incineration or BIF facilities in the Detroit or Port Huron areas burn PCB wastes.

***B. Uniform State and Provincial requirements be established for incineration facilities in the reference region based on the principle of zero discharge of persistent toxic substances.***

The difference between the U.S. and Canada's regulatory approaches makes it very difficult to obtain uniformity between State and Provincial requirements. The U.S. supports the need for comparable environmentally protective requirements for incineration facilities. The U.S. prefers that Federal, State and Provincial authorities exchange scientific and technical information and that requirements be comparable in terms of environmental objectives established and results achieved. The U.S. preference is in keeping with the practice of international law, which operates on the basis that countries agree to objectives, and the means of achieving the objectives is determined by the respective domestic policy making process.



The aforementioned USEPA policies and regulations regarding municipal, medical, and hazardous waste incinerators are national in scope. Accordingly, States will adopt new rules into their regulatory programs that are no less stringent than Federal rules and regulations. In this manner, the U.S. assures that the application and implementation of these policies and regulations achieve a fully environmentally protective and "uniform" application across States.

Also, the U.S. notes that in this recommendation, the Commission extends the U.S. policy of "zero discharge" of persistent toxicants to the Great Lakes to an expectation of "zero emission" to the atmosphere. The U.S. believes that through instituting more stringent control requirements for incinerators, it will achieve great progress towards zero emission of persistent toxicants during the next few years. It is the policy objective of the U.S. to obtain this important progress which shows "continuous improvement" toward zero emissions. Zero emission of persistent toxicants is a desirable long-term goal that will continue to be pursued incrementally in tandem with the technological innovations that promote pollution prevention.

***C. Governments monitor incinerator emissions for phosgene gas when chlorinated organic materials are being incinerated and institute effective controls to prevent the production of this gas.***

The U.S. supports and is implementing this recommendation. Phosgene gas is one of the more toxic potential byproducts of incomplete combustion (PICs) of chlorinated organic materials. Accordingly, the U.S. includes this gas among PICs that must be both monitored in the trial burn as well as included in the subsequent risk assessment, which are parts of the permitting process for hazardous waste incinerators and Boilers and Industrial Furnaces (BIFs). The U.S. sets a maximum chloride feed rate in hazardous waste streams as a permit specification for these incinerators and BIFs in order to forestall the formation of phosgene gas.

***3. Governments adopt a specific, coordinated binational strategy within two years with a common set of objectives and procedures for action to stop the input of persistent toxic substances into the Great Lakes environment, using the framework developed by the Virtual Elimination Task Force.***

Both the U.S. and Canada are presently reviewing their respective initiatives on virtual elimination with the intention of improving the coordination of their efforts in this area. The U.S. supports the recommendation to develop a binational strategy with Canada within two years (i.e., by February 1996) and has held discussions with Canada in the summer and fall of 1994 to advance work on this binational strategy. The U.S. and Canada believe many of the elements of a binational strategy are in place, although they may not have been expressly identified as such. There is a need to better portray efforts underway and also to provide a more coordinated and systematic analysis of options for attaining further reductions in the releases of persistent toxic substances.

In addition, using the framework developed by the IJC Virtual Elimination Task Force, a Virtual Elimination Pilot Project has been initiated and is underway in the U.S.. In 1993, the USEPA, in concert with Great Lakes States, and with the participation of multiple stakeholders, began a Virtual Elimination Pilot Project for bioaccumulative chemicals of concern, which has focused initially on PCBs and mercury. This effort is identifying regulatory and non-regulatory opportunities to spur reduction in use and release of these chemicals. As a direct result of this project, the Federal Government has temporarily suspended sales of mercury by the Department of Defense; USEPA and the Department of Defense will work jointly to determine the long-term Federal policy regarding the Federal sales of mercury. USEPA has also commissioned an Agency-wide task force to identify comprehensive measures to reduce mercury contamination nationwide. In addition, Great Lakes States have been leaders in a substantial shift towards prevention of mercury pollution. Minnesota is a national leader in adopting strong pollution prevention measures, including banning sales and disposal of certain mercury products.

*4. Governments adopt a specific timetable for the virtual elimination of persistent toxic substances in the Lake Superior basin as part of their pilot project for zero discharge and virtual elimination, and publish an initial biennial State of the Lake Superior Basin report, including specific indicators of progress on virtual elimination and zero discharge of persistent toxic substances, not later than December 31, 1994.*

The U.S. supports the intent of this recommendation but has major concerns with the practicality of its implementation, particularly in the establishment of timetables, when sources of persistent toxic substances may not be readily identifiable and directly controllable in the U.S. and Canada. The U.S. believes that zero discharge is a long range goal and that timetables, if and when established, should be developed with the involvement of all concerned stakeholders to avoid being counterproductive. In addition, economic issues associated with zero discharge must be balanced with the environmental goal of zero discharge.

Under the Lake Superior Binational Program, the U.S. and Canada are pursuing an action plan with specific goals and priorities. These goals and priorities are based, to the extent possible, on direct input and active involvement by the stakeholders around the Lake Superior basin. An initial priority was the designation of critical pollutants that are presently impacting environmental conditions in the lake. Nine chemicals were initially identified in the binational agreement and will form the basis for the development of a Lakewide Management Plan (LaMP), which will lead to the future achievement of a goal of zero discharge from all sources to Lake Superior.

Procedures for identifying additional substances will be based on:

- lakewide impairments of beneficial uses;
- exceedences of standards for water quality, biota, or sediments; and

- failure to achieve Great Lakes Water Quality Agreement and other ecosystem objectives.

The governments responsible for implementing the Lake Superior LaMP are committed to establishing timetables for specific load reduction actions leading to the ultimate goals of zero discharge, virtual elimination, and full restoration and protection of beneficial uses. The Lake Superior LaMP will ultimately address a wide range of stressors which impact or have the potential to impact the Lake Superior ecosystem, and is the primary mechanism for assessing progress and ensuring accountability.

In response to the Commission's recommendation that the Governments publish a biennial State of the Lake Superior Basin report, the U.S. in cooperation with Canada, commits to updating and publishing a Lake Superior LaMP on a biennial basis. The LaMP will set forth an evaluation of impaired beneficial uses, environmental objectives and indicators, including indicators of progress toward zero discharge, identify pollutant loadings and sources, and establish actions to reduce pollutant loads to Lake Superior and address other stressors which impact or have the potential to impact Lake Superior. The U.S. expects that a Lake Superior LaMP identifying load reduction targets and management actions will be ready for public review and comment in September 1995.

In the Parties' approach to zero discharge and virtual elimination, consideration is given to processes involving long-range atmospheric transport of persistent toxic substances and recirculation of materials from lake sediments, which will continue to influence lake conditions. Atmospheric sources are the principal pathway of loadings to Lake Superior; in the U.S. there are virtually no known detectable water discharges to Lake Superior of the nine targeted compounds. Because atmospheric sources are located mainly outside the basin; and in some cases, pollution is due to past practices, the U.S. and Canada will continue to review their respective domestic programs and contribute to international agreements as a means of reducing contaminant influences on the Great Lakes from such sources. The Parties will carry this out as a component of a binational toxics strategy.

***5. Governments publish an initial biennial State of the Great Lakes Ecosystem report not later than September 30, 1995. This report should address specific measures of progress towards virtual elimination and zero discharge of all known persistent toxic substances in the Great Lakes basin, and include specific information on sources of pollutants.***

The U.S. and Canada sponsored the first State of the Great Lakes Ecosystem Conference (SOLEC), with supportive reports, in October 1994. These reports included information on physical, biological, and chemical stressors affecting ecosystem and human health and their relative importance in influencing basin-wide and lake-specific conditions. Summary information on major sources of loadings (e.g., the atmosphere, point sources and non-point sources), including examples of progress in reducing or eliminating sources of persistent toxic substances and the resultant reductions of these compounds found in the ecosystem, were

presented by the Parties. As an output of the SOLEC reports, findings and discussions held at the conference, the Parties will publish an initial report on the State of the Great Lakes Ecosystem during 1995.

The U.S. currently produces a variety of materials which report progress towards virtual elimination and zero discharge of persistent toxic substances. These include, but are not limited to, the reporting requirements which are part of the LaMP and Remedial Action Planning processes, USEPA's Report to Congress on the Great Lakes Ecosystem, and the biennial reporting to the IJC pursuant to the Great Lakes Water Quality Agreement.

***6. Governments develop and use comprehensive frameworks for reporting on the State of the Great Lakes Ecosystem, including both the natural and human components of the ecosystem and the linkage between them.***

The U.S. supports this recommendation and has been working closely with Canada on initiating a variety of binational activities which include frameworks for reporting on the State of the Great Lakes Ecosystem.

The State of the Lakes Ecosystem Conference (SOLEC) provided the Parties the opportunity to report more broadly on physical, chemical, and biological stressors on the aquatic, terrestrial, and human elements of the ecosystem. The SOLEC reports will also provide information on human activity and economic conditions in the basin. Just as importantly, it will illustrate data gaps which must be filled in order to increase our understanding and influence our decision-making. The U.S. views SOLEC as a mechanism to promote consensus on a reporting framework that involves measures of ecosystem health, key indicators of human activity, and the representation of management efforts, including measures of progress. It is the intention of the Parties to review the experience of the 1994 SOLEC, including feedback received from participants, and identify approaches to improve binational reporting on the Great Lakes.

LaMPs and the Connecting Channels RAPs are other examples of a framework for binational reporting on the linkages between the natural and human components of the ecosystem. Within the LaMP process, ecosystem objectives and indicators are being developed which will be used in the future to assess environmental progress. Both LaMPs and RAPs use an ecosystem focus for their respective geographic scopes and as such will report on all aspects of the ecosystem and their relationships to one another. Periodic LaMP and RAP updates provide a useful and timely source of information.

In the U.S., the USEPA and the Agency for Toxic Substance and Disease Registry (ATSDR) are currently conducting a number of Congressionally-mandated epidemiological studies which examine the bioaccumulative effects of eating contaminated Great Lakes fish. Study subjects include Native Americans, minority populations, pregnant females, fetuses and nursing infants of mothers who consume contaminated fish, the elderly, and sports fishers. A

Report to Congress on progress and findings will be completed in early 1995. Also, the Great Lakes States and USEPA are cooperating on the development of a uniform fish consumption advisory, assuring consumers of Great Lakes fish consistent health advice. The new advisory criteria will use even more sensitive reproductive endpoints.

USEPA's Assessment and Remediation of Contaminated Sediments (ARCS) program has completed the documentation of its findings. These include a Report to Congress and human health risk assessment documents for five Areas of Concern.

There are also human health-related reports generated by other USEPA programs such as the Toxic Release Inventory (TRI), which provides information on releases of over 600 chemicals from manufacturing facilities; the National Water Quality Inventory 305(b) Report also reports on the water quality in the Great Lakes and other basins; and the 1992 National Study of Chemical Residues in Fish which includes estimates of human health risk.

***7. Governments continue to develop and support environmental curricula at all levels of education as a fundamental component in a new way of thinking.***

The U.S. supports this recommendation and views environmental education at all levels of society as an important means to ensure continuing stewardship of the Great Lakes. The USEPA supports the development of environmental education programs through grants, workshops, curricula development projects and partnerships.

At the national level, the National Environmental Education Act of 1990 is fostering the public's environmental literacy by focusing on the education of youth and educators and the training of individuals for environmental careers. Some of the provisions of the Act include developing environmental education and training programs, curricula materials, providing environmental internships, awarding environmental education grants and forming partnerships with other environmental education providers.

The U.S. has also taken steps to increase Great Lakes environmental education, and a number of key projects and initiatives are underway:

- The Federal Government is supporting teacher training and curricula development. An example of this type of teacher outreach and training program is USEPA's "Great Minds, Great Lakes" program which has taken place aboard the USEPA's research vessel, the R/V Lake Guardian at a number of cities throughout the basin. EPA conducts Great Lakes educational workshops for teachers in advance of them bringing their classes on-board ship for the "Great Minds, Great Lakes Program".
- USEPA is targeting communities that may have not benefitted from environmental education opportunities in the past. Methods for achieving this important goal include both USEPA's Environmental Justice, and Environmental Education Grant programs.

An example of the types of projects the Agency is funding under these programs is the Nature Conservancy's Mighty Acorns Project in Southeast Chicago, a community with a variety of environmental justice concerns. This project will provide hands-on education and habitat restoration activities in the area. Similar projects are being funded under the Environmental Justice Grant Program. The Agency is also funding the development of environmental education materials which incorporate Tribal customs and traditions into Native American environmental education curricula.

- USEPA is supporting the Great Lakes Unique Habitats Project, a multimedia educational campaign designed to help promote a stewardship ethic and protection activities for the globally unique habitats found in the Great Lakes basin. This project will produce a children's book and musical tape on the Great Lakes ecosystem aimed at ages 8-12, public service announcements on the Great Lakes, and a television special focussing on the unique natural communities located in the Great Lakes.
- USEPA has entered into a cooperative agreement with a group of academic institutions, corporations, and nonprofit organizations headed by the University of Michigan to develop and operate a national teacher training program. The National Consortium for Environmental Education and Training (NCEET) program targets in-service teachers (kindergarten-12th grade) and nonformal educators, and includes teacher training, curriculum evaluation, and information dissemination. The program will also work closely with USEPA to conduct an assessment of the field of environmental education and to continue the development of a computerized environmental education resource library.
- Through a grant to the American College of Occupational and Environmental Medicine in Arlington Heights, Illinois, USEPA is supporting the development of a core curriculum in environmental medicine aimed at educating healthcare professionals about environmental risks. These professionals can then serve as environmental educators in their communities, helping to increase public awareness of health concerns in the Great Lakes community.
- USEPA and the States are supporting an innovative community-based project involving voluntary water monitoring programs in schools in the Lake Superior basin. Under the Lake Superior Riverwatch Project, children will gain a better understanding of Lake Superior environmental issues.
- ATSDR and the National Institute for Occupational Safety and Health are co sponsoring a project funded through a cooperative agreement with a consortium of medical schools in the Southeast. It is entitled "Educating Physicians in Occupational Health and the Environment". The goal of this project is to work with primary care residency programs to introduce curricula in occupational and environmental medicine.

- ATSDR and the National Academy of Sciences/Institute of Medicines are cooperating on a project entitled "Educating Health Professionals in Environmental Health". The purpose of this project is to investigate and recommend how to develop, implement, and finance medical and nursing curricula activities in environmental health. This process would include identifying priority target audiences and core curriculum, determining appropriate environmental health content for each educational level of medical students and nurses, and recommending effective education methods. Reports will be issued on the project findings.
- In the near future, ATSDR plans to make available its Great Lakes Technical Information Network that will provide information relevant to the ATSDR Great Lakes Human Health Effects Research Program.
- USEPA and Environment Canada are revising the Great Lakes Atlas, a valuable educational tool that has been very well received by schools, private institutions, and by members of the public. The Atlas provides fundamental environmental and socioeconomic information on the Great Lakes.
- USEPA is making environmental education information, materials, and educational software available on the INTERNET, via the use of the Great Lakes Information Network (GLIN), a computer bulletin board on Great Lakes issues which is accessible by the public.

***8. Senior government officials allow Remedial Action Plans to be community led rather than dominated by regulatory agencies. To be successful, RAPs must integrate the efforts of all agencies, stakeholders and concerned community members towards restoration of beneficial uses within a comprehensive ecosystem approach.***

The U.S. recognizes and supports the concept that a successful RAP process requires meaningful public participation. The majority of the Areas Of Concern have active RAP Public Advisory Committees (PACs), representing a broad range of stakeholder interests, which are involved in all stages of the RAP process. The Federal and State Governments in the basin are vigorously pursuing high levels of public participation in all Areas of Concern.

While the eight Great Lakes States have the lead in preparing and implementing the RAPs, it is recognized that all levels of stakeholders have varying amounts of resources and expertise to bring to bear in the AOCs. These include USEPA, via its financial and technical assistance programs, as well as its statutory authorities; and the input and expertise of other Federal agencies and organizations; local governments, industrial and environmental groups, and individual citizens. Active, balanced involvement of all stakeholders which incorporates the strengths and resource that each can bring to the process is vital to the success of the RAP process.

It is important to note that there is no one correct method for managing the RAP process that works equally well in every AOC. The formal management mechanism created will depend to a large extent on the nature of the impairments in a given Area of Concern, and the resources and tools available to the stakeholders in the AOC.

***9. Governments support incorporation of human health concerns and pollution prevention measures into Remedial Action Plans.***

The U.S. supports this recommendation and is currently incorporating human health concerns and pollution prevention measures into RAPs to meet the goals of the Great Lakes Water Quality Agreement.

USEPA has made the protection of human health one of the cornerstones of its environmental protection activities and has incorporated this into all of its programs. The Agency is particularly concerned with the potential health effects of consuming Great Lakes fish. As noted earlier in this document, a Congressionally mandated study is being conducted by USEPA and ATSDR in the Great Lakes basin. This study will identify human populations residing in the Great Lakes who may be at risk due to contact with chemical contaminants, and will make recommendations regarding ways to prevent adverse health effects. Groups being studied include: Native Americans, African Americans, the elderly, sport anglers, and nursing infants and fetuses of mothers who consume Great Lakes fish. Some of these studies are being conducted in AOCs. Findings from these studies will be disseminated throughout the basin.

Human health effects information (such as those being developed in the ATSDR study) is being used in an innovative educational program where core curriculum in environmental medicine is being developed for educating healthcare professionals about environmental risks. These professionals can then serve as environmental educators in their communities, helping to incorporate human health effect concerns into the RAPs.

Remedial Action Plans currently address human health concerns in a variety of ways. Fish and wildlife consumption, beach closings and drinking water consumption are three beneficial uses that are directly addressed in the process. State water quality standards, which are a critical factor in establishing goals to restore beneficial uses, include human health considerations. Human health risk assessments, particularly if an AOC has Superfund or RCRA sites, are frequently performed as a part of the RAP development process. Agency reviews of RAPs identify the human health components and concerns so that the total ecosystem approach is taken into account when planning remedial activities.

The U.S. supports the second part of this recommendation, and has identified pollution prevention as the guiding principle for all programs administered by USEPA. Pollution prevention is being actively encouraged and practiced in RAPs through both voluntary and regulatory programs such as guidance and policy, through municipal and industrial



pretreatment and worker training programs, and through public education and awareness campaigns. In addition, USEPA is supporting pollution prevention activities in RAPs via funding through a variety of grant programs.

The U.S. Great Lakes Pollution Prevention Action Plan highlights and recommends the incorporation of pollution prevention throughout the basin, including AOCs. One of the activities highlighted in the Action Plan is an introductory pollution prevention training emphasizing opportunities to reduce pollution at the source. This training was conducted in five states during 1992.

The Agency is also helping to support a pollution prevention pilot project in the St. Clair River, Michigan/Ontario and the Rochester Embayment, New York Areas of Concern. This effort builds on the introductory training, and involves very close work with the RAP stakeholders to identify and implement prevention opportunities. Results will be disseminated to AOCs on both sides of the basin.

Programs such as the Green Lights Program, the Great Printers Project and the Auto Project have the potential to achieve significant reductions in the loadings of persistent toxic substances to the Great Lakes. The U.S. Lake Superior Pollution Prevention Strategy describes pollution prevention activities needed to reduce the loadings of the nine Lake Superior Binational Program Zero Discharge target substances. The Virtual Elimination Project is providing valuable information towards reductions of mercury and PCBs in the Great Lakes basin. Although these initiatives are basinwide, in many cases the results of these efforts will be directly applied in AOCs.

***10. Governments encourage the publication of periodic updates of activities and goals associated with each Remedial Action Plan to allow improved monitoring of implementation progress and to communicate local experiences to other areas and groups.***

The U.S. supports this recommendation and is working with its State partners to ensure regular, timely and accurate information on progress in Areas of Concern. These updates will increase in importance as the governments and various stakeholders look for ways to assess the effectiveness of remedial activities being implemented during the RAP process. The U.S. is currently employing a variety of communications vehicles and is planning to expand these in the near term.

Recently, USEPA and Environment Canada initiated and published a thorough review and progress report for the 43 AOCs. This document was made available for the public in October 1994. In addition, a USEPA Great Lakes program bulletin, which has a wide private/public distribution, highlights progress and innovative activities being implemented in AOCs.

Many RAP Teams are writing periodic updates on the RAP process which serve as sources of

information on RAP activities during the periods between the publication of the various RAP stages. These updates provide concise, timely information to the public for the assessment of progress towards the RAP goals.

Local RAP newsletters exist for most of the U.S. AOCs, and are usually written by the Public Advisory Committee, with support by the State RAP program. These newsletters highlight RAP activities and are distributed throughout the AOC. In many States, local PACs hold annual State PAC meetings, which are open to the public and which highlight RAP activities via the production of annual updates and presentations.

The U.S. would like to ensure that all of the above sources of RAP information receive the most widespread distribution possible. In order to meet this important goal, USEPA is actively incorporating formal RAP documents and other related information onto the INTERNET via the Great Lakes Information Network (GLIN). This information can then be publicly accessed. USEPA hopes in the future to disseminate all the RAP Stage documents via the INTERNET as well as any newsletters that we receive. This will allow AOC stakeholders to share information and innovative methods with other RAP practitioners in a timely manner.

*11. Governments improve the understanding of groundwater pollution and its impact on the Great Lakes, and act to eliminate its causes.*

The U.S. agrees with and supports this recommendation and has developed programs to improve the protection, remediation, and understanding of groundwater pollution in the Great Lakes basin through a variety of approaches.

Under the Comprehensive Groundwater Program approach, USEPA is working with the Great Lakes States to integrate activities across State programs. The goal is for groundwater protection and remediation to be coordinated throughout State programs. A State that can demonstrate that its treatment of groundwater is truly comprehensive can direct federal assistance toward State-determined priorities. The Agency is also coordinating activities related to groundwater across relevant programs.

Under Superfund and RCRA, groundwater is monitored and remediated. The Agency also oversees the Underground Injection Control Program which governs direct injection of wastes into the subsurface. This program, at the Region and the State level, is giving much attention to a little documented area of concern known as Class V injection wells, of which service station drainage pits are but one example. Several States maintain ambient monitoring networks for groundwater quality, which may be financially supported in part by EPA.

Under the Agency's Geographic Initiatives, a variety of successful actions have taken place to eliminate causes of potentially significant sources of groundwater pollution in the Great Lakes basin. Several notable examples are:

- In the Grand Calumet River/Indiana Harbor Canal Area of Concern, USEPA, the Indiana Department of Environmental Management, and five private companies have negotiated a precedent setting Memorandum of Understanding which outlines voluntary actions the companies will take to prevent the movement of millions of gallons of petroleum distillates, floating on top of groundwater deposits, from migrating to the Indiana Harbor Canal and, ultimately, to Lake Michigan.
- On the Niagara River, EPA and the New York State Department of Environmental Conservation have published ambitious schedules for remediating the 26 waste sites estimated to contribute 99% of the potential loading, primarily through groundwater, of toxic chemicals to the river. Interim measures at the sites have already reduced the potential loading by approximately 25%. Semi-annual reports detail progress in remediating the sites. Most sites are scheduled for remediation by 1996, and all sites are scheduled for complete remediation by 1998.

*12. Governments incorporate those radionuclides which meet the definition of persistent toxic substance in their strategy for virtual elimination.*

The U.S. cannot fully support this recommendation. The majority of the long-lived radionuclides detected in the Great Lakes basin occur naturally. The U.S. does employ a comprehensive, multi-media regulatory process which addresses anthropogenic sources and potential releases from a variety of nuclear facilities within and outside of the basin. But these anthropogenic sources are insignificant when compared to naturally occurring radionuclides. Average radiation exposure to Great Lakes residents (human and wildlife) from all anthropogenic activities is a negligible fraction of natural background exposure and well below the acute or chronic effects level.

Anthropogenic sources are addressed by a variety of statutory programs and Federal and State agencies, which regulate actual emissions to the atmosphere and surface waters from all licensed facilities. These emissions have been kept well below the regulatory dose limit. These limits have been developed to ensure the protection of human health and the environment. The U.S. will continue to research this area and will develop new limits if warranted. This approach is consistent with recommendations developed by the IJC on Radiological Protection and the United State's National Commission on Radiation Protection and Measurement. 2

*13. Federal governments provide coordinated national inventories of toxic air emissions to allow better estimates of toxic substance deposition to Lake Superior. A binational group should be established to review, coordinate and propose means to (a) identify data requirements; (b) develop guidelines and timetables; (c) set priorities; and (d) propose and coordinate research.*

The U.S. supports this recommendation. Recommendations from the Great Waters Study and findings contained in the draft Lake Superior LaMP point to the potentially significant loadings of persistent toxic substances in the Lake Superior basin via atmospheric deposition.

USEPA and the States are working with the Great Lakes Commission to develop an Air Toxics Inventory for the eight Great Lakes States. The Technical Steering Committee overseeing this project includes members from all basin States, Canada, and U.S. EPA, with observers from private corporations and States outside the basin. The Committee has identified data requirements and candidate toxic substances. The current list of toxics to be inventoried totals 49, and includes mercury and total PCBs. The project completed its pilot phase over Southwest Lake Michigan in Summer 1994 and is currently being extended to include all of the Great Lakes States. This project is scheduled to be completed by January 1996.

The project has produced a protocol, an important first step so that all the States are compiling their portion of the inventory with consistent methodology and using the best emissions estimation techniques. The project is also producing a state-of-the-art database and a client/server computer system for the updatable inventory. Each State will have their portion of the inventory in their State, with the regional data repository located at USEPA's Great Lakes National Program Office (GLNPO), in Chicago, Illinois.

Also, USEPA is working to develop a national emissions inventory, beginning with screening level inventories for the most important chemicals and replacing that data with more complete data as it becomes available. The Great Lakes inventories are serving as a model for more complete inventories, and Louisiana is the first non-Great Lakes state to begin developing a comparable database with EPA support.

***14. Federal governments develop, by the end of 1994, a research plan to assist in developing estimates of toxic substance depositions to the Lake Superior basin.***

The U.S. has a variety of monitoring activities and ongoing research in place in the Lake Superior basin. These include monitoring of loadings to the lake from point sources and atmospheric deposition. This work has helped to improve the estimates of toxic loadings from all sources. The U.S. recognizes the need to improve upon the current estimates of toxic deposition in order to better target its standards development and source control activities. One goal of the Lake Michigan Mass Balance project, now in progress, is to provide a prototype methodology for calculating the mass balance of toxic deposition to the lake, and to be transferrable to other lakes and waters, including Lake Superior.

USEPA is currently funding a number of projects which are researching the deposition of toxics substances, particularly mercury and PCBs, to Lake Superior.

Increased binational cooperation on monitoring will help refine estimates of toxic deposition.

The Lake Superior Binational Program Monitoring Subcommittee has very recently begun working on the development of a Binational Monitoring Strategy for Lake Superior. This strategy will address air deposition, biota, fish, and water. In the first year, the Subcommittee's goals are to assemble a binational team of monitoring specialists to review monitoring data that have been collected at all levels of government and by universities. This will help to identify data requirements to direct future monitoring activities. The next step will be to synthesize the existing data and knowledge on Lake Superior in order to come up with the directions the monitoring strategy should take, i.e., which questions the strategy will be designed to answer. The governments anticipate beginning implementation of an initial binational monitoring strategy during calendar year 1997.

***15. Federal governments establish and maintain monitoring stations within an integrated Atmospheric Deposition Network pursuant to Annex 15 of the Great Lakes Water Quality Agreement.***

The Parties have established an Integrated Atmospheric Deposition Network (IADN) to monitor both wet and dry atmospheric loadings of toxic substance. Five Master Stations, one on each of the Great Lakes, have been in operation since December 1992. The Stations monitor for PCB congeners, and a suite of pesticides, polycyclic aromatic hydrocarbons, and trace metals. The Parties signed a Binational Quality Assurance Program Plan for the network in May 1994. The first binational report on the data collected by this effort was made available in September 1994. The U.S. began an intensive one year mercury monitoring program at U.S. IADN sites in October 1994.

The IADN Network currently focuses on monitoring. Results of data collected by the five current IADN sites indicate that there is rather little spatial variability in many of the critical chemical species across the basin. While it is essential to maintain air monitoring in the Great Lakes basin, the additional high costs of adding a large number of satellite monitoring stations may not be the most useful method of monitoring and controlling emissions of air toxics. This has led to a reassessment of future IADN priorities by the Parties.

Both nations are therefore moving towards limiting the expansion of the network and instead will concentrate on the additional research needed to clarify aspects of the behavior of toxic chemicals in the atmosphere. This information will aid in the refining of parameters involved in estimating loadings and improving source controls.

***16. Federal governments ensure that the assessment and registration of pesticides and new chemicals in Canada and the United States include specific provision for considering environmental and human health implications including endocrine-mimicking and bioaccumulation potential.***

The U.S. supports this recommendation and is evaluating its current testing program to ensure

adequate protection against introduction of new chemicals which may have endocrine-mimicking and bioaccumulation potential. While bioaccumulation potential is not expressly considered in the current testing program of pesticides and chemicals for industrial and commercial purposes, available fate tests will identify the environmental risks posed by bioaccumulative chemicals. Similarly, available standard toxicological tests for reproductive, developmental, immunological, and oncogenic effects will identify chemicals that may have endocrine-mimicking potential, since they would in part induce such effects as evaluated in these studies.

The U.S., however, recognizes the need for conducting studies to better understand how endocrine disruptors, i.e., agents that act like hormones or alter hormonal actions, may contribute to a myriad of adverse effects to humans, wildlife and aquatic species, including reproductive function and development, the immune system, and the development of neoplasia. Specific and more sensitive tests and tools need to be developed and validated to identify new agents that may have endocrine-mimicking potential. Additionally, there is a need to develop guidance on how information on endocrine disruption can be incorporated into the risk assessment process. A national research agenda on these substances is being developed.

*17. Senior officers of business enterprises in and near the Great Lakes basin conduct environmental audits of their procurement, production and marketing activities in relation to the goals of the Great Lakes Water Quality Agreement; develop and announce corporate environmental stewardship policies which include the concept of sustainable development; and prepare annual reports relating to that policy for public review and regular review by the enterprises' senior management body.*

Recommendation is not directed to government.

*18. Industry and professional associations develop and implement environmental awareness programs and environmental stewardship and/or sustainable development guidelines for their organizations and members. These should include standards on environmental claims in advertising and on identifying and encouraging special labelling for products that do not incorporate persistent toxic substances.*

Recommendation is not directed to government.

*19. Labour unions include in their negotiations the issue of transition to a sustainable economy without persistent toxic substances.*

Recommendation is not directed to government.

***20. Governments, industry and labour begin devising plans to cope with economic and social dislocation that may occur as a result of sunseting persistent toxic substances.***

It is generally not the policy of the U.S. to create environmental regulations and laws that cause economic or social dislocation. Moreover, the U.S. does not foresee any significant economic or social dislocation from phasing out the use of persistent bioaccumulative toxic substances. Although much progress has been made in this area, more progress will be gradually accomplished in the future as we achieve our long range goals and strategies.

Already, generation of many bioaccumulative chemicals of concern has ceased in this country (i.e., 14 pesticides identified as BCCs under U.S. EPA's Great Lakes Water Quality Guidance). For example, mercury use has declined substantially, and several key sectors have taken opportunities to develop new products or processes that eliminate or greatly reduce the use of this and other chemicals of concern. Already, mercury use in batteries is being reduced, and it is expected that more reductions of generation and use of these chemicals will continue in the future.

***21. The news media give greater priority to investigating, identifying and reporting on the sources and effects of persistent toxic substances, as well as on success stories about reducing ecosystem degradation and achieving its restoration, as critical issues in society.***

Recommendation is not directed to government.

***22. Post-secondary educational institutions encourage the integration of education and research across the physical, biological, and social sciences to provide an integrated scientific basis for learning and policy making.***

Recommendation is not directed to government.

