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COMMENTS/COMMENTAIRES:

Please find attached a letter from Minister Manley together with a report entitled "Canada's Response to the Recommendations in the Tenth Biennial Report on Great Lakes Water Quality of the International Joint Commission".

B. Paul Gibbard

Paul Gibbard
Acting Director
U.S. Transboundary Division

P.S. Original to follow by hand.

now rec'd July 24/01

Minister of Foreign Affairs Ministre des Affaires étrangères

Ottawa, Canada K1A 0G2

The Honourable L'honorable
John Manley P.C., M.P. c.p., député

Draft was rec'd on July 20/2001

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Mr. Murray Clamen
Secretary, Canadian Section
International Joint Commission
234 Laurier Avenue West, 22nd Floor
Ottawa, ON
K1P 6K6

Dear Mr. Clamen:

I am pleased to convey to you the enclosed report entitled "Canada's Responses to the Recommendations in the Tenth Biennial Report on Great Lakes Water Quality of the International Joint Commission".

The report was prepared by Environment Canada in conjunction with various federal and provincial ministries which contribute to the Canadian Great Lakes Program. The response has also benefited from consultations with the United States on those recommendations which call for some form of binational initiative.

I wish you success at the upcoming Biennial Forum on Great Lakes Water Quality in Montreal. The Canadian Government looks forward to continuing to work closely with the Commission, both at the Biennial Forum and through ongoing communications and exchanges.

Yours very truly,

Enclosure

cc: The Honourable David Anderson, P.C., M.P.

Canada

CANADA'S RESPONSE
TO THE
RECOMMENDATIONS IN THE
TENTH BIENNIAL REPORT ON GREAT LAKES WATER QUALITY
OF THE
INTERNATIONAL JOINT COMMISSION

June 19, 2001

INTRODUCTION

Canada welcomes the recommendations contained in the International Joint Commission's (IJC) *Tenth Biennial Report*. The Government of Canada remains strongly committed to the Great Lakes Water Quality Agreement (GLWQA) and appreciates the on-going work of the IJC, its advice on progress under the Agreement, and its views on opportunities to improve performance and effectiveness of government programs designed to accelerate progress on cleaning up the Great Lakes.

The Government of Canada's actions to clean-up and protect the Great Lakes ecosystem and fulfill Canada's international obligations under the GLWQA were formalized in 1989 with the launch of the Great Lakes Action Plan. The program was renewed in 1994 as the Great Lakes 2000 initiative, a six year partnership among seven federal departments. Last year, the Government of Canada announced an additional $40 million dedicated to completing federal actions required to remediate Canadian Areas of Concern. This initiative is part of the Great Lakes Basin 2020 Action Plan, which provides the framework to coordinate the efforts of eight federal departments to restore, conserve and protect the Great Lakes Basin over the next five years.

The Governments of Canada and Ontario are currently in the process of negotiating a renewed Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA) - the 5th such federal-provincial arrangement since 1971. The COA affirms the commitment of both governments to fulfill Canada's obligations under the GLWQA, and

establishes a strategic framework for coordinating shared federal/provincial responsibilities in relation to the Great Lakes Basin ecosystem. The Governments of Canada and Ontario look forward to signing a new COA by the end of summer.

The responses to the recommendations of the International Joint Commission's Tenth Biennial Report reflect the input of several federal and provincial agencies that contribute to the overall Canadian program on the Great Lakes. These include, but are not limited to: Environment Canada; Health Canada; Fisheries and Oceans Canada; Agriculture and Agri-food Canada; Canadian Heritage; Transport Canada; Public Works and Government Services Canada; Natural Resources Canada; Ontario Ministry of the Environment; Ontario Ministry of Natural Resources; and the Ontario Ministry of Agriculture, Food & Rural Affairs. The progress that has been made in the Great Lakes over the last fifty years however, is not attributable to governments alone. The achievements of the program would not be possible without the many contributions of our partners - industry, municipalities, environmental and conservation interest groups, conservation authorities, First Nations, and private citizens - who all help to deliver, in their own right, significant environmental results.

The International Joint Commission correctly asserts that there are many challenges ahead. Continuing the clean-up in Areas of Concern; preventing the introduction, and control of exotic species; mitigating the impact of rapid urban growth on environmental conditions throughout the basin; and reducing the contribution, by long-range atmospheric transport, of contaminants to the Great Lakes are major tasks ahead. Both Canada and Ontario, and their partners, remain committed to follow through on their efforts to restore and maintain the chemical, physical and biological integrity of the Great Lakes Basin ecosystem, and ensure a healthy, prosperous and sustainable future for it.

Remedial Action Plans

IJC Recommendation:

"Given the public's right to know the achievements in each AOC and what actions to expect in the future, the Parties should prepare a consolidated report on RAP progress that lists the accomplishments to date, funds expended, what remains to be done and the funds and timing required to finish the necessary work. Governments must clearly state what role they will be playing with each AOC and what resources they will be dedicating to restoring the impaired beneficial uses."

Response to Recommendation:

Canada and Ontario recognize that communicating progress in Areas of Concern (AOCs) is important, and the level of reporting that is required under the Great Lakes Water Quality Agreement (GLWQA) Annex 2 does not fully meet this need. There are many additional mechanisms that assist in disseminating information to the public and obtaining feedback on program priorities and decision making, including:

- Agency participation and liaison with local implementation leaders.
- Local public advisory committee involvement and other community-based participation on implementation teams.
- Consultation with communities on specific implementation actions such as the development of Natural Heritage Strategies and Sediment Management Strategies.
- Remedial Action Plan (RAP) newsletters highlighting progress (e.g. Hamilton, Quinte), distributed within the AOC and beyond.
- Information sharing and technology transfer sessions held on RAP issues through Environment Canada's Great Lakes Sustainability Fund (GLSF, formerly Cleanup Fund) collaboratively with Ontario, as well as regular Project Summaries Reports of the GLSF.
- Maintenance of RAP websites for all of Ontario's AOCs.
- RAP progress updates on a lakewide basis through LaMP reporting, annually on Lake Ontario and every two years in Erie and Superior.

As Canada and Ontario establish a renewed agreement for the Great Lakes (COA), AOC specific workplans which outline required implementation actions and monitoring needs are critical for identifying what remains to complete RAP implementation leading to recovery of the impaired beneficial uses. Canada and Ontario are reviewing the status of RAPs and developing these workplans. The role, and specific commitments to implement actions called for in RAPs, of the federal and provincial governments will be specified in the renewed COA in 2001. It is through this process that Canada and Ontario will consolidate information on what actions to expect in the future, with recognition of what has been accomplished to date.

A clear commitment of resources dedicated to restoring impaired beneficial uses is evident in the federal government Budget 2000 announcement. This has ensured the continuation of the Great Lakes program and secured $40 million over the next 5 years, including a new $30 million implementation fund - the Great Lakes Sustainability Fund (GLSF 2020) which will be dedicated to funding federal implementation actions in the AOCs. Partnerships are important to the successful implementation of RAP activities and are being sought actively through the federal program and the Great Lakes Sustainability Fund. As successful partnerships and proposals are developed, the resources dedicated to individual projects are announced to the public. Ontario also commits to working with communities to ensure that voluntary and regulatory instruments are applied for RAP implementation.

Threat to Human Health

IJC Recommendation:

"Governments should require that:
(i) sport fish consumption advisories state plainly that eating Great Lakes sport fish may lead to birth anomalies and other serious health problems for children and women of child-bearing age. These advisories should be addressed and distributed directly to women, in addition to their general distribution,
(ii) consumption advisories clearly identify fish to be totally avoided in light of the precautionary approach, and preparation methods for any that may be consumed, and
(iii) consumption advisories are supported by culturally appropriate community education programs directed to those who are likely to consume these fish."

IJC Concern:
"Sport fish consumption advisories state plainly that eating GL fish may lead to birth anomalies and other serious health problems for children and women of childbearing age."

Response to Recommendation:

Fish consumption advisories for Canadians are based on guidelines developed by Health Canada. These guidelines provide safe consumption doses, also known as the tolerable daily intake, for a number of contaminants. The proportion of the tolerable daily intake that can come from each of the environmental pathways (e.g. air, water, food) including fish consumption, is determined. Estimates and calculations are then carried out by the Ministry of the Environment (Ontario) to determine if fish are suitable for consumption. The sport fish consumption guide provides detailed information on the basis for fish consumption advisories, how to use the guide appropriately, what the sport fish contaminant monitoring program entails, and the range of contaminants tested for in Ontario.

Health Canada reviews on a regular basis toxicological information and revises its guidelines as required. Health Canada has recently established lower tolerable daily intakes for mercury and mirex/photomirex, to further protect most sensitive individuals such as women of childbearing age and children under 15.

The *Ontario Government's 2001-2002 Guide to Eating Ontario Sport Fish* includes important advice specifically for women of childbearing years (women who are pregnant, intending to become pregnant or are breast-feeding mothers) and for children under 15 in various sections of the booklet to ensure this special group of consumers is

properly informed. The advisory recommends that women of childbearing age and children under 15 consume no more than four meals per month of fish that are identified as having very low contaminant levels, and not to consume fish from any other category. The advisory also takes into account the consumption of certain species of commercial fish which tend to contain higher levels of mercury such as swordfish, tuna (canned tuna excluded) and shark by recommending minimal consumption of these fish to this group of individuals.

The Guide is being updated on a regular basis to incorporate new analyses and methods. Currently methodology is being developed for the detection and reporting of dioxin-like PCBs. Changes to the Guide text are planned to further reinforce the importance of the consumption information for women of childbearing age and children.

Anglers and their families can safely continue to enjoy fishing and eating their catch if they follow the local fish consumption advisories and advice found in the *2001-2002 Guide to Eating Ontario Sport Fish*. Positive aspects to sport fishing include nutritional and social benefits.

IJC Concern:
"Consumption advisories clearly identify fish to be totally avoided in light of the precautionary approach, and preparation methods for any that may be consumed."

Response to Recommendation:

The advice provided in the *2001-2002 Guide to Eating Ontario Sport Fish* consumption advisory is intended for anglers and their families who consume moderate quantities of fish. The advice on consumption will protect individuals who follow the guide and consume no more than eight meals of the fish (fish with very low levels of contaminants) they catch per month (four meals for women of childbearing age and children under 15). The advisory contains five different fish consumption symbols based on Health Canada consumption guidelines for the intake of various contaminants tested in sport fish. The symbols range from consumption of no more than eight meals per month to no consumption at all.

Consumption guidelines are based on laboratory analyses which use only the lean, dorsal, skinless boneless muscle tissue of the fish. The advisory recommends that only skinless boneless fillets of sport fish be consumed as other parts of the fish - whole fish, fish steaks or belly fat - may contain higher concentrations of organic contaminants. A section on preserving and preparing fish for consumption is included in the advisory.

It is important to consider the health benefits of eating sports fish. A number of species contain high levels of beneficial fatty acids (Omega-3), proteins and certain essential

vitamins (e.g. vitamin D) and minerals (e.g. Selenium).

IJC Concern:
"Advisories should be addressed and distributed directly to women, in addition to their general distribution; consumption advisories are supported by appropriate community education programs directed to fish eaters."

Response to Recommendation:

The *Guide to Eating Ontario Sport Fish* is generally known and used among anglers and the response from users has been positive overall. Over 350,000 copies of the 1999-2000 Guide were distributed.

The Guide is also distributed, available or advertised as follows:
On the Environment Ontario website (www.ene.gov.on.ca).
To all Ontario Medical Officers of Health, along with information on mercury.
As a news release at the time of publication through major newspapers and radio stations.
In Ministry of Natural Resources Fishing Regulations.
to various cultural associations that have opted to print summaries of the Guide in their respective languages, either through local newspapers or related media.
In the Chinese community newspaper in Toronto.

In addition, Health Canada, through its Great Lakes Health Effects Unit, has prepared and distributed handouts - which explains the *Guide to Eating Ontario Sport Fish* - at Areas of Concern. These handouts are available in 12 different languages. (Note: the Ontario Ministry of the Environment with the assistance of Health Canada hopes to update and re-distribute the handout in the year 2001).

Contaminated Sediment

IJC Recommendation:

"Governments should immediately develop a comprehensive, binational program to address the full scope of the contaminated sediments problem over the long term, setting appropriate priorities and defining the resources required for completion. As part of this comprehensive program, governments should ensure that:
(i) programs and cost estimates are in place and made public for fully addressing contaminated sediments in Areas of Concern,
(ii) timetables for fully implementing those programs are established and made

public,
(iii) resources are provided to fully implement the programs in accordance with the established timetables, and
(iv) progress reports are issued at least biennially."

Response to Recommendation:

The Commission, in the preamble to its recommendation on contaminated sediment, has outlined the significance of persistent toxic substances in sediment in restoring environmental conditions in Areas of Concern. In addition, the Commission has noted some of the efforts by the Parties and by the Commission itself, with the support of the Parties, to respond to this issue. The Governments of Canada and the Province of Ontario are fully appreciative of these needs and have been working cooperatively with industrial stakeholders and other private and public sector interests in Areas of Concern to identify and implement necessary sediment remedial actions.

The Commission has noted some concern with the application of the site specific approaches taken by the Parties as manifested in the apparent contradictions in the cleanup goals to be attained. The example of polycyclic aromatic hydrocarbons (PAHs) in the Black River (U.S.) and Hamilton Harbour (Canada) was cited. The Randle Reef project in Hamilton Harbour is a proposed targeted intervention at a specific hotspot of contamination and the PAH level specified is used to delineate the hotspot. It should not be construed as an overall cleanup goal for Hamilton Harbour. The effort at Randle Reef follows an overall sediment remediation strategy that has been developed for Hamilton Harbour by a Remedial Action Plan (RAP) Technical Team and endorsed by the RAP stakeholders (December 1995, 1995 Update to the Hamilton Harbour Remedial Action Plan stage 2 Report, ISBN 0-7778-4897-X). The strategy designates zones for active intervention (i.e. hotspots where sediment is acutely toxic to benthos), supports experimentation with techniques such as capping to evaluate potential remedial measures, and calls for monitoring and research to evaluate results. The approach taken in such a strategy is consistent with advice coming from the Commission's Sediment Priority Action Committee which called for an incremental approach to the management of contaminated sediments and restoration of beneficial uses.

The Commission has also presented additional information to illustrate what it believes to be the outstanding requirement for sediment remediation. More specifically, it is noted that in Canada only 0.2 percent of sediment contamination has been remediated. The basis for this figure was not presented and Canada sought supporting information from the Commission which was subsequently provided to the Parties. We believe the assumptions and calculations made by the Commission are misleading as they pre-suppose that evidence of contamination must lead to some form of direct intervention with a remediation project. While chemical criteria are often used to spatially delineate

areas of sediment contamination, decisions on intervention integrate additional information on toxicity, field biological assessment, and environmental benefits including linkages to the restoration of use impairments. As well, sediment remediation interventions must be technically and economically achievable. To illustrate the point, the Commission in its calculations has identified 600,000 cubic metres in the St. Clair River as requiring remediation. Substantial work has been undertaken to assess sediment contamination in the St. Clair River and analysis of potential remediation needs have focused on projects involving substantially less than this figure. While further assessments are being pursued to define remediation needs, we believe the Commission's figure exaggerates the requirement.

To avoid possible confusion Canada will be providing more complete status reports on sediment related work in the AOCs, including projected remediation needs.

With respect to the specific recommendation brought forward by the Commission, Canada responds as follows:

Canada, in consultation with the United States, does not support the development of a binational program to address contaminated sediments. The Parties believe that the response to sediment management needs, including program definition, resourcing, timetables, and progress reporting, legitimately falls under the authority and responsibility of the domestic programs in Canada and the United States. The appropriate jurisdictions and agencies who are responsible for delivering on the these commitments in the AOCs are to be accountable.

As noted above, Canada will undertake, as part of its progress reporting, to provide more detail on its sediment program and activities to be more responsive to the Commission's needs as expressed in the recommendations. Canada would further note that at the binational level considerable interchange exists at scientific and technical levels to advance sediment assessment methodologies and technology development for sediment treatment. Also, under the Great Lakes Binational Toxics Strategy, the Parties have initiated work to enhance progress reporting on sediment related activities and associated priority toxic substances and to support joint efforts such as an April 2001 workshop on contaminated sediment treatment technologies. Sediment related matters are also discussed by the Parties under the Lakewide Management Plans, the Canadian Review Panel for Massena (St. Lawrence River) Superfund Sites, and the Four Party Agreement for the Detroit/St. Clair and St. Marys Rivers and Lake St. Clair. These efforts, together with others, contribute to a substantive binational dialogue on this issue and support the commitments on contaminated sediment under Annex 14 of the Great Lakes Water Quality Agreement.

Airborne Toxic Substances

IJC Recommendation:

"The Parties should take the following measures to deal with airborne pollutants: (i) identify both in-basin and out-of-basin sources of atmospheric deposition of persistent toxic substances to the Great Lakes, quantify their contribution to the total burden of these substances to the lakes, and use this information to formulate and implement appropriate prevention and control measures; and (ii) adopt a source-receptor computer model, improve emissions inventory information, and add dioxin and mercury to the Integrated Atmospheric Deposition Network to improve the data bases for these two substances."

Response to Recommendation:

The Commission calls for the identification and quantification of the atmospheric sources of pollutants entering the Great Lakes. The Government of Canada supports the measures recommended by the IJC and is addressing the recommendation by virtue of addressing existing obligations. Specifically Annex 15 - Air Borne Toxic Substances of the Great Lakes Water Quality Agreement - calls on the Parties to develop models of the intermediate and long-range movement and transformation of toxic substances to determine the significance of atmospheric loadings to the Great Lakes system relative to other pathways and the sources of such substances from outside the Great Lakes system. Canada has been developing source-receptor models, in keeping with the IJC recommendation, and has applied them to address the issue of the contribution from in-basin and out-of-basin sources. Canada will continue to use these and other models to address this concern.

The Government of Canada agrees with the Commission regarding the desirability of improving knowledge about air emissions of substances targeted by the Binational Toxics Strategy. Such information is not only needed as a basis on which to formulate control measures but is critical information in the application of the source receptor models discussed above.

One measure of the effectiveness of prevention and control measures to address substances of concern is whether environmental levels show changes in concert with changes in the emissions. The US/Canada Integrated Atmospheric Deposition Network (IADN) is well placed to address this question. Measures to reduce mercury and dioxins emissions are addressed by the Great Lakes Binational Toxics Strategy and in terms of describing the environmental response, Canada has been monitoring atmospheric mercury [the vapour phase] at the two Canadian IADN Master stations since 1997, and with the recent purchase of the necessary equipment, Canada will begin routine measurements of mercury in precipitation, this fiscal year. For dioxins and furans, measurements have been made at one IADN master station since1996 and additional

measurements are planned. These measurements will make a significant contribution to quantifying the deposition of these substances to the Great Lakes.

Great Lakes Binational Toxics Strategy

IJC Recommendation:

"The Parties should strengthen the Great Lakes Binational Toxics Strategy by fully addressing all sources of persistent toxic substances, such as atmospheric transport and deposition and *in situ* contaminants in sediments. In order to include the air pathway the Parties should:
i) establish an inventory of baseline air emissions for toxics for all of the United States and Canada
ii) undertake a complete analysis of emission reduction scenarios for key source regions and determine their effectiveness in reducing contamination of the Great Lakes from the air.
The Parties should ensure that the Strategy is truly both strategic and binational by strengthening the integration and priority-setting component and establishing a full-time binational secretariat."

Response to Recommendation:

The Great Lakes Binational Toxics Strategy (GLBTS) is an action-oriented process that provides a forum for stakeholders to exchange information on a set of quantitative challenges for certain persistent toxic substances. The shared information empowers stakeholders to take responsible and best practice actions that go beyond compliance and encourages pollution prevention. The GLBTS focuses on the virtual elimination of anthropogenic environmental releases of persistent toxic substances in a step wise process. The GLBTS is not a regulatory process but rather it complements federal, state and provincial activities. The Strategy does not have a specific end point in time. The GLBTS has provisions to revisit both the reduction timelines and targets for all of the Level I substances. The Strategy has additional provisions to allow the Parties to elevate Level II substances to Level I, and add new substances which present a threat to the Great Lakes basin ecosystem.

IJC Concern
"The Parties should strengthen the Binational Toxics Strategy by fully addressing all sources of persistent toxic substances, such as atmospheric transport and deposition and in situ contamination in sediments. In order to include the air

pathway the Parties should:

i) **Establish an inventory of baseline emissions for toxics for all of the United States and Canada."**

Response to Recommendation:

An inventory of air toxics (COA Tier 1 and 2 substances) for the Great Lakes Basin exists and is maintained and updated jointly by Environment Canada and the Ontario Ministry of Environment. Reporting to this inventory is on a voluntary basis, and source coverage has been less than satisfactory. On January 24, 2000, Ontario proposed a mandatory emission reporting regulation for 358 substances, including all COA air toxic substances. This regulation is expected to come into effect this year and Ontario facilities that meet the reporting criteria will submit emission reports beginning in June 2002. In setting emission thresholds for facilities, Ontario is aiming for 80% of the total emissions in Ontario to be reported under the proposed regulation. With respect to in situ contamination in sediments, the GLBTS will report out on an annual basis to track sediment remediation activities occurring within the Great Lakes Basin beginning with the base year of 1997. This reporting attempts to track both volumes of contaminated sediments removed in a given year as well as the mass of GLBTS substances associated with those volumes where this information is available.

IJC Concern

"ii) undertake a complete analysis of emission reduction scenarios for key source regions and determine their effectiveness in reducing contamination of the Great Lakes from the air:"

Response to Recommendation:

Environment Canada and others are investigating and testing several mathematical models for prediction of ambient air concentrations of particulate matter, ozone and their precursor substances, with a view to analyzing emission reduction and other policy scenarios for these substances in key source regions, including domestic and transboundary air pollution flow scenarios. Through this activity, we should be able to estimate the effectiveness of emission reduction policy scenarios on air quality improvements and the attainment of Canada-Wide Standards for PM and Ozone. The information resulting from these models may also be of use to atmospheric deposition and water quality activities in the Great Lakes Basin.

Under the GLBTS, a multi-media approach has been adopted with respect to reduction scenarios for substances of concern, with the goal of improvements to air and water quality and protection of ecosystem health and environment, including reducing contamination of lake water through reducing atmospheric deposition.

IJC Concern
"The Parties should ensure that the Binational Toxics Strategy is truly both strategic and binational by strengthening the integration and priority-setting component and establishing a full-time binational secretariat."

Response to Recommendation:

The Integration Workgroup was established by the Parties on June 19, 1998 in Romulus Michigan. This Workgroup was open to a broad membership of interested stakeholders and was charged to provide advice to the Parties on how best to address both cross-cutting issues that effected a multiple number of substance Workgroups (such as addressing all sources of persistent toxic substances from atmospheric transport and deposition and in situ contamination in sediments) or unresolved concerns of individual substance Workgroups. The decisions with respect to priority setting, however, rest with the Parties alone.

The Parties have established both a Canadian and United States co-secretariat. On the Canadian side, this responsibility falls to the Great Lakes Manager within the Environmental Protection Branch of Environment Canada.

In addition to addressing the IJC's recommendations related to the GLBTS, Canada would like to offer its perspective on comments in the 10th Report on the breadth of actions to address PCB's as environmental contaminants, and deposition of mercury.

IJC Concern
"After three years, however, no workgroup has entirely completed the four step process. For example, the PCB Workgroup is currently focusing on steps 3 and 4, but has only documented actions for the reduction of PCB inventories currently in use or in storage. This initiative does not address PCBs in sediments or the deposition of PCBs from long-range sources via the atmosphere. Although PCBs in use and in storage may constitute a potential long-term threat, PCBs circulating in biota cause the greatest immediate harm to Great Lakes fish, wildlife and humans."

Response:

The targets for PCBs under the GLBTS relate specifically to PCB equipment. Hence, the PCB workgroup's focus has been on mobilizing stakeholders towards achieving this target. The workgroup's primary focus has been the decommissioning and destruction of PCB equipment and associated wastes.

The PCB workgroup has completed Step 3 (identifying options for reducing PCBs).

Step 4 of the Four Step Process addresses implementation and is an ongoing activity within the workgroup.

In-use and stored high level PCBs, especially in equipment, have been shown to be a source for airborne deposition of PCBs. By directly targeting a noted contributor of airborne PCBs, namely PCBs in equipment, the Government of Canada is working towards abating a sizable source for airborne PCBs. Concurrent with actively engaging stakeholders on destruction of PCB equipment, the Government of Canada is also undertaking regulatory amendments which will make mandatory the destruction of PCBs in use and in storage by 2010, thereby further helping to significantly reduce a source of airborne PCBs.

IJC Concern

"Progress in environmental control of mercury has occurred despite the fact that IADN does not include mercury in its program. If IADN included mercury, the Workgroup could estimate loadings of mercury to the Lakes, thereby assessing the ecosystem effects of its reduction efforts."

Response:

As mentioned in the response to the Airborne Toxic Substances recommendation, Canada has been monitoring atmospheric mercury [the vapour phase] at the two Canadian IADN Master stations since 1997 and routine mercury in precipitation measurements will begin shortly. These measurements are a first step in quantifying their contribution to the total burden of these substances to the Great Lakes.

Land Use

IJC Recommendation:

"The Governments should provide for a binational study of the effects of changes in land use on Great Lakes water quality to determine the measures that should be taken to address these changes, including:
(i) the effects of urban and residential growth,
(ii) the effectiveness of existing policies and programs in controlling pollution from land use in all sectors, and
(iii) the identification of measures that should be taken by provincial and state governments, with appropriate assistance from the Parties, to prevent adverse effects.
Governments should proceed with implementation of the SOLEC work on Biodiversity Investment Areas, emphasizing the preservation and rehabilitation of

wetlands."

Response to Recommendation:

The Government of Canada agrees that changing land use is one of the dominant long-term threats facing the Great Lakes basin ecosystem. It is expected that, over the next 20 years, the Great Lakes Basin will account for one half of total population growth in Canada. By 2020, it is estimated that the number of Canadians in the Basin will have increased by more than 2 million - a growth rate of 22%. Most of this growth will occur along the western end of Lake Ontario in what is referred to as the Golden Horseshoe region (extending from Niagara Falls to Oshawa) - the third most rapidly growing population centre in North America.

Urban land use pressures are being explicitly addressed in the two largest Areas of Concern - Toronto and Region, and Hamilton Harbour - both of which comprise the centre of Ontario's rapidly growing urban area. Both of these AOCs have made linkages with local and regional land use planning processes. Land use issues are also being addressed in the development of Lakewide Management Plans. In addition to Toronto and Region, and Hamilton Harbour, both the previous Great Lakes Cleanup Fund and its successor, the Great Lakes Sustainability Fund, have put a high priority on funding Natural Heritage Strategies, which address urban and rural land use issues in Areas of Concern. Specifically, they have worked with Severn Sound, St. Clair River, Detroit River, Wheatley Harbour, Niagara River, Hamilton Harbour, and Metro Toronto and Region to complete Natural Heritage Strategies. Natural Heritage Strategies covering all of the Bay of Quinte are almost complete. Many local governments have incorporated these strategies into regional and municipal Official Plans including: Severn Sound, St. Clair River, and Bay of Quinte. Work is ongoing with Hamilton Harbour and Metro Toronto municipalities to incorporate Natural Heritage Strategies into their Official Plans.

The influence of land use on the Great Lakes basin ecosystem, including water quality, air quality, habitat, and biodiversity was addressed as a major theme in the State of the Lake Ecosystem Conferences (SOLEC) of 1996 and 1998, and was again noted as a significant stress at the 2000 Conference.

There are some forthcoming opportunities in Ontario to influence local land use decision-making in the Great Lakes. The Provincial Policy Statement on land use is scheduled for a statutory 5-year review this year and this may provide the opportunity to influence the review of province-wide policies and identify measures that should be taken to prevent adverse effects, as called for in the IJC recommendation. Also, as part of the Ontario government's Operation Clean Water strategy, the Minister of Agriculture, Food and Rural Affairs introduced for first reading, a *Nutrient Management Act* on June 13, 2001. Under the proposed act, clear new standards will be developed for nutrient

management on farms and all land-applied materials containing nutrients relating to agriculture – including livestock manure, commercial fertilizer, municipal biosolids, septage and industrial pulp and paper sludge. The proposed legislation would provide authority for regulations governing several areas including:

- mandatory Nutrient Management Plans (NMP's);
- certification of commercial land applicators of materials containing nutrients;
- distance requirements for manure and biosolids application near wells and waterways;
- banning the land application of untreated septage over a five-year period;
- establishing and delivering associated education training and certification programs;
- establishing a database system to record land application of materials containing nutrients, with an initial focus on biosolids and manure; and
- establishing minimum quality and application standards for land applied nutrients.

The proposed legislation would provide for a framework to phase in standards over time depending on the size of operations and the kinds of practices that are carried out.

The province has also announced a temporary development freeze for the Oak Ridges Moraine, a significant headwater source for the Greater Toronto bioregion.

However, a major binational study of the effects of changes in land use on Great Lakes water quality conditions - as called for in the IJC recommendation - would likely be too broad and the effort too lengthy to capture the opportunities that currently exist to influence land use policy in the province of Ontario. While there may be some opportunity for a smaller-scale, domestic land use study, the challenge remains that the federal and provincial governments have relatively little influence over local land use planning and decision-making. (Provincial policy can, however, influence the municipal planning process and guide land use decisions on Crown lands (e.g., forest management planning)). Therefore, the most effective way, at this time, to address the land use impact mentioned in the IJC's 10th Report is through:

- reviewing provincial policy;
- maintaining a strong emphasis on integrating land use changes and pressures into Remedial Action Plans, Lakewide Management Plans, and in the development of SOLEC indicators; and
- by ensuring that urban and rural land use issues remain a major funding priority of the Great Lakes Sustainability Fund.

Canada agrees in principle with the importance of conserving and protecting ecologically sensitive areas. There are already a range of government and non-government initiatives which in some measure achieve this objective. The principles underlying the Biodiversity Investment Areas (BIA) concept are important and merit continued commitment and support. However, before embarking on the implementation of a new initiative/concept, the Parties need to take stock of these existing protection

and conservation initiatives, and the extent to which these important principles are being met. Canada's approach will be to work together towards one set of shared ecologically sensitive features/areas, and in so doing, to not duplicate or re-invent but build upon and add value to existing initiatives, to value existing working relationships, partnerships and partners, and where necessary to address any missing links and gaps in our protection and conservation of ecologically sensitive areas.

The path forward will require further discussion with other government and non-government groups who share these principles but who may not have been engaged in SOLEC to date. SOLEC has proceeded as far as it can in focusing attention on the science underlying biodiversity investment areas and in developing the BIA concept. The Canadian Wildlife Service - Ontario Region is increasing its focus on wetland science and indicators. Canada views ecologically significant areas as components of the broader ecosystem approach of Lakewide Management Plans (LaMPs). In terms of proceeding further with a shared investment in ecologically sensitive areas, natural resource agencies including Environment Canada, and non-government interests, will need to consider how to better ensure these principles are put into practice, with the necessary focus on science and indicator monitoring. In this regard, a future SOLEC may consider looking at monitoring indicators in ecologically significant areas, as reference sites.

The Province of Ontario recently announced a four year, $102 million commitment to help implement the Living Legacy program through the implementation of new protected areas and the Great Lakes Heritage Coast signature site. A part of this initiative could directly complement the implementation of the concept of biodiversity investment in ecologically significant areas. Canada supports this initiative, and the range of similar related initiatives and programs, and is prepared to offer its assistance, through COA and Canadian Wildlife Service national and international programs, in the protection and conservation of ecologically significant Great Lakes sites.

Alien Invasive Species

IJC Recommendation:

"The Parties should take the following measures to deal with alien invasive species:
(i) adopt and implement the binational ballast water research strategy and plan described in the 1996-1997 Binational Progress Report on Protection of Great Lakes Water Quality,
(ii) give a Reference to the Commission to develop:
(a) binational standards that should be applied to discharges of ballast water, and
(b) recommendations on the most appropriate methods for implementing those

standards including, for example, the possibility of on-board treatment of ballast water and residual ballast sediment and the possibility of establishing ballast water and residual ballast sediment treatment facilities in the lower St. Lawrence River."

Response to Recommendation:

Binational Research Strategy

The Tenth Biennial Report notes that the IJC has not received a response to a November 1998 letter sent to both Parties on the adoption by both Parties of the ballast water research strategy and plan as outlined in the 1996-7 report of the Commission on Protection of Great Lakes Water Quality. The reality is that the binational research strategy has, in fact, been adopted in one form or another by a number of parties on the road toward understanding Aquatic Nuisance Species and is not limited to the GLWQA.

With regard to the mechanisms that both countries have developed to make progress on this issue, the United States has established the Great Lakes Panel of the Aquatic Nuisance Species Task Force (set up under the authority of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990). The Great Lakes Panel - formally adopted a slightly abbreviated form of the strategy in February of 1998. In March 2001, the Panel released a policy statement on ballast water management that makes recommendations with respect to standards, coordination and technological research needs for the Great Lakes Basin. The Canadian federal government and the Province of Ontario are represented on the Great Lakes Panel.

In Canada, the binational research strategy was presented to the National Working Group of the Canadian Marine Advisory Council (CMAC) in November 1997 and subsequent meetings, and has been supported by that group. Additionally, this research strategy has been presented to both subgroups of the CMAC Great Lakes Ballast Water Working Group (GL and St Lawrence).

In practice, this has meant that the various funding agencies have considered the strategy in a fairly broad context when making grants specific to the ballast water vector. Thus, since 1998 the U.S. Coast Guard (U.S.C.G.) and the National Oceanic and Atmospheric Administration (NOAA) Seagrant funding has in fact gone to projects that examine the tenets of the strategy. Representatives of the Parties also sit on these grants evaluation committees. For example, studies have taken place to examine the efficacy of ballast water exchange both with respect to safety and to examine the field tests and protocols that confirm ballast exchange has taken place at sea. While many of the studies have not been specific to the Great Lakes, the results are fully applicable to them. The NOAA Seagrant program has specifically required a focus on both the Great Lakes and Chesapeake Bay in its statement of requirements.

In Canada, representatives of the Department of Fisheries and Oceans (DFO) and Transport Canada (TC) provided data and information to Lloyds Register in their study of the safety of sequential exchange and assisted in communicating the study findings in North America at CMAC and the 10th Annual Aquatic Nuisance Species Conference in Toronto in February 2000, as well as to the International Maritime Organization.

The pathogen - human health issue was examined both by the Phase II studies of the Great Lakes Demonstration Project and more recently by researchers at the Smithsonian Institute with results being disseminated not only in the periodical *Nature* but also via CNN, CTV News and the Globe and Mail.

The 'no ballast onboard' (NOBOB) issue is being examined by a number of agencies and forums. The issue of sediment/mud is currently being addressed by a binational study involving the Great Lakes Environmental Research Lab (GLERL), the University of Windsor and Canadian experts. The Department of Fisheries and Oceans has funded a national ballast water project from the Environmental Science Strategic Research Fund. DFO has also supported type testing of Hydrocyclone/U.V. technology that could be applied to mitigate ballast water uptake in ships.

Biocide studies currently underway at the University of Michigan (Gluteraldehyde) and the Michigan Department of Environmental Quality (Chlorine) are both expected to result in pilot projects in the upcoming year. Federal Commerce and Navigation (FEDNAV LTD.) has cooperated fully and has offered ship access and time for these studies. DFO Canada has supported studies into organic acids (Juglone / Periacetic acid / Hydrogen Peroxide) as has NOAA Seagrant.

Ongoing research as outlined in the strategy has been supported. The Great Lakes Demonstration Project has been relocated for logistical reasons to a facility in Duluth and testing took place on secondary treatment options (U.V. and Hydrocyclone /U.V.) this season. Representatives of the Parties sit on the Steering and Technical Committees for the project. As well, representatives of the Parties have been very involved with the various forums chaired by the Michigan Department of Environmental Quality examining operational possibilities for NOBOB's and biocides. Representatives of the Parties have acted as Chair of the Research Committee of the Great Lakes Panel of the Aquatic Nuisance Task Force.

To date, one area that has not had any significant follow-up has been the further examination of heat as a biocide (shoreside or shipboard). Australian studies continue and a number of engine manufacturers – notably Wartsila - are looking at the issue, but there has been little progress specific to the Great Lakes.

IJC Reference

Canada recognizes the value of the IJC assuming a coordinating role to deal with alien invasive species in the Great Lakes but does not support the concept of an IJC reference at this time.

Canada's support is tempered by the need to prioritize funding for IJC studies and references. Canada's support is also tempered by the fact that the Canadian and U.S. governments are already working closely in this area and consider that progress is being made. Canada has stated its intention to develop ballast water management regulations for the Great Lakes and St. Lawrence River in 2002. These proposed regulations are being developed in consultation with the U.S. Coast Guard in order that they be harmonized with U.S. requirements. Also, both Canada and the U.S. are working through the International Maritime Organization to develop international regulations and standards. Again, progress is being made.

Both Parties have supported the need for standards with respect to the discharge of ballast water. Indeed a number of forums hosted by the Parties (U.S.C.G. Ballast Water and Shipping Committee; Standards Forum – 10th ANS Conference Toronto) have examined how such standards could be applied.

There is considerable debate by "experts" on both sides of the border not only as to the standards that could be applied but the form that they would take and how they physically and legally could be applied. Biologically-based discharge standards are advocated by some (e.g. Great Lakes Fishery Commission; DFO Science). Others favour technology-based standards based on "Best Available Technology" (U.S.C.G Standards Committee, the shipping industry in general).

With respect to the possibility of a facility for treatment of ships located in the St Lawrence, DFO Science is reviewing the economic, technological, and policy considerations of establishing such a facility in the coming months. An Environment Canada/Transport Canada study will examine the impacts of ballast water treatment both on the shipping industry of the Great Lakes and the environment. It is assumed that the outcome of these studies will be useful in addressing the IJC's concerns on this issue..

Information and Data Management

IJC Recommendation:

"The Parties should develop and maintain the full range of monitoring and surveillance programs necessary to enable them to fulfill their commitments

under the Great Lakes Water Quality Agreement.
The Parties should provide adequate access to data while protecting confidentiality agreements and waiving cost recovery policies that contradict the intent of Article IX of the Great Lakes Water Quality Agreement.
The Parties should correct existing problems with the collection, analyses and reporting of data, including establishing sampling protocols, filling data gaps and ensuring the quality of data.
The Parties should, within two years, develop and implement a binational information policy employing advanced technology to support implementation of the Great Lakes Water Quality Agreement. This policy should include provision for:
(i) accessibility of data and information,
(ii) organization and management of data bases,
(iii) protocols to ensure compatibility and comparability of data for weight of evidence and ecosystem integrity analysis,
(iv) support of indicator development, and particularly indicators that support the goals of drinkability, swimmability, and edibility of fish, and
(v) principles for evaluating information for decision-making."

Response to Recommendation:

The Government of Canada acknowledges the essential role monitoring and surveillance programs play towards the fulfillment of its commitments under the Great Lakes Water Quality Agreement. Canada, in concert with the relevant provincial and United States agencies, is determined to continue pursuing mechanisms to optimize and streamline Great Lakes monitoring and surveillance activities to derive maximum benefits from available resources. The Canadian and Ontario governments are committed, under a renegotiated COA, to set up federal-provincial mechanisms to ensure the development, coordination, and maintenance of the required monitoring and surveillance programs necessary to fulfill Canada's commitment under the GLWQA.

Canada provides, upon request and at no cost, Great Lakes water quality program data directly to the IJC Regional Office, as per Article IX of the Agreement.

The Government of Canada is also committed to the collection of valid, good quality data and the timely analysis and reporting of the collected information. Canada is committed to following best quality management practices, that are appropriate to the program needs and consistent with international standards, in the operation and management of its analytical laboratories. For example, all of the water quality data generated by the operational laboratories of Environment Canada meet international standards of accreditation (ISO Guide 25, Canadian Standard CAN/CSA-Z753-95) granted through the Standards Council of Canada. Also, the Environment Canada National Laboratory for Environmental Testing (NLET) undergoes biennial five-day

audits by the other three parties (i.e. US EPA, NYS DEC, and OMOE) to the Niagara River Toxics Management Plan/Declaration of Intent. The last audit was conducted during the period October 23-27, 2000.

The Government of Canada notes the Commission's recommendation for the development and implementation of a binational information policy, within two years, to support implementation of the GLWQA and is prepared to work with the United States government to this end. The Parties have recognized the value of a binational database for improved data accessibility and reporting, and have adopted such an approach to manage the information collected by the Canada/US Integrated Atmospheric Deposition Network (IADN) under Annex 15. In addition, advanced technology in the form of a computerized quality assurance protocol is used to ensure compatibility and comparability of data collected by all parties to IADN. The success of this initiative may serve as a model for a comprehensive binational information policy.

Environment Canada is presently in the midst of developing an Information Management and Information Technology (IM/IT) Strategy to deal with a wide variety of issues that it will have to address in the coming 3-5 years. This project includes a review of current management practices associated with program information that is created, used or transferred to or from the Department. The Strategy will promote the use of IM/IT standards and protocols and is expected to provide further direction on Great Lakes data and information management practices.

Environment Canada is also exploring the development of a federal Canadian Information System for the Environment (CISE). A Task Force has been assigned the job of designing an integrated knowledge management system for environmental information. The Task Force will be considering the following elements: monitoring and data collection; information management and information technology; research tools and networks; and communication needs and opportunities. The scope of this project is largely restricted to the natural environment although linkages to other knowledge systems, such as the Health Information System (managed by the Canadian Institute for Health Information), will be made.

SOLEC and Indicators

IJC Recommendation:

"The Parties should report on indicators for the three Desired Outcomes of drinkability, swimmability and fish edibility beginning with the SOLEC 2000 conference and biennially thereafter.
The Parties should report on indicators for the Desired Outcome of virtual

elimination of inputs of persistent toxic substances beginning with the SOLEC 2002 conference and biennially thereafter.
The Parties should develop and report on three specific indicators for the Desired Outcome of physical environment integrity beginning with the SOLEC 2002 conference and biennially thereafter."

Response to Recommendation:

The Parties reported on indicators of human health relating to beach closures, fish consumption advisories and drinking water quality at a limited number of water treatment plants taking and treating Great Lakes surface waters at SOLEC 2000. The Parties intend to expand on the data base supporting these indicators for SOLEC 2002, so that a more comprehensive picture of these indicators can be given at that time.

Canada and the U.S. have reported on a number of indicators relating to persistent toxic chemicals at SOLEC 2000. These indicators provide information on the trends in contaminant levels in the ambient environment, including fish, wildlife and water. The Parties believe that through such reporting, the progress of virtual elimination of PTS can be measured through the reduction of contaminant levels in the environment.

Finally, the Parties have been developing a proposal for a SOLEC multi-year plan. This plan lays out a framework for reporting on biological, chemical and physical integrity. The proposal suggests that the focus of SOLEC 2002 be on biological integrity, and that future SOLECs deal with physical and chemical integrity.