



## Canadian Environmental Law Association

L'ASSOCIATION CANADIENNE DU DROIT DE L'ENVIRONNEMENT

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### TOXIC CHEMICALS AND THE RENEGOTIATION OF THE GREAT LAKES WATER QUALITY AGREEMENT

The Canadian Environmental Law Association (CELA), a public interest environmental law clinic, has been involved for four decades in issues of toxic chemicals and the Great Lakes as well as in regulatory reform to reduce and control the introduction of toxics into the environment where they impact ecosystem and human health. CELA was involved in successful efforts to insert “virtual elimination” into the GLWQA and into the Canadian Environmental Protection Act (CEPA). CELA has campaigned successfully for the passage of Ontario’s Toxic Reduction Act and Toronto’s Environmental Disclosure and Reporting By-Law. CELA staff has been involved in the Remedial Action Planning and Lakewide Management processes in the Great Lakes and have written extensively about the history of the Great Lakes Water Quality Agreement, and participate in environmental and health coalitions that strive to improve protection of the Great Lakes - St. Lawrence River ecosystem. CELA also has been active in reviews of CEPA and in Canada’s Chemical Management Plan.

These comments are in response to a webinar held March 4, 2010 to solicit guidance for Canada on toxic chemicals and the renegotiation underway of the Great Lakes Water Quality Agreement. Canadian Environmental Law Association staff has participated in this consultation and are submitting these additional comments in response to questions raised and to others’ comments during this webinar. We are concerned that such a small group of Canadians were participating in this webinar on a topic of considerable broad public concern to Canadians. Key stakeholders who have a long history of involvement in these issues were not involved. We request that the stakeholders, including First Nations who are represented on the Stakeholder Advisory Panel (SAP) or in parallel consultations to the Government of Canada be given the benefit of consideration of these issues. The time table for completing the drafting of a revised Great Lakes Water Quality Agreement is very ambitious and the consideration of controlling toxics is central to a renewed Agreement.

### **TOXIC CHEMICALS ~ CHALLENGES GROW IN COMPLEXITY**

The Great Lakes-St. Lawrence River Basin continues to be a significant pollution hotspot in Canada. In 2002, over 100 million kilograms of pollutants were released into air and water in the Great Lakes Basin by the larger facilities located in the Great Lakes Basin,<sup>1</sup> that are required to report their emissions to Canada’s National Pollutant Release Inventory and U.S. Toxic Release Inventory. Smaller and medium sized facilities contribute unrecorded amounts of loadings to air, land and water in the region.

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<sup>1</sup> PollutionWatch. Partners in Pollution: An Assessment of Continuing Canadian and United States Contributions to Great Lakes Pollution. February 2006. Accessed at [www.PollutionWatch.org](http://www.PollutionWatch.org).

Municipal waste water facilities are among the largest sources of pollution to the Great Lakes as aging infrastructure and inadequate treatment results in routine loadings, sewer bypasses and overflows to Great Lakes waters. The hundreds of thousands of chemicals found in use in the U.S. and Canadian markets may all eventually find their way into the Great Lakes and into the aquatic food web of the ecosystem. The long recognised threats to the Great Lakes from toxic chemicals persist despite some progress made in the past two decades to decrease the levels of some of these chemicals such as lead, mercury and PCBs from industrial sources. New chemical threats are being recognised. Human, aquatic and wildlife health science and research programs in the Great Lakes have not kept pace. Focus on the impacts to health of wildlife species and human health has been sporadic and has failed to keep pace with the proliferation of pollution to the ecosystem.

Recently a multi-board body of the International Joint Commission investigating chemicals of emerging concern highlighted the detection of chemicals such as lindane, pesticides, brominated flame retardants, perfluorinated surfactants, synthetic musks and short chain chlorinated paraffins, which are used in a wide range of consumer, cosmetics, and pharmaceutical products, and which are being detected consistently in the water, air, sediments and wildlife species of the Great Lakes. The toxics management framework in Canada and the U.S. had not focused its attention on these chemicals until very recently. The inadequacy of control measures applied at the end-of-pipe and the reliance on wastewater treatment plants to remove these chemicals from entering the environment have not resulted in the required protection to human health and the environment of the Great Lakes basin. This was recently reinforced in January 2010 when the Ontario Ministry of the Environment released their report *Survey of the Occurrence of Pharmaceuticals in Untreated Source and Finished Drinking Water in Ontario* which concluded “This survey confirms that certain pharmaceuticals and BPA are detected at trace levels in Ontario’s untreated and finished drinking water”.<sup>2</sup>

Evidence continues to mount showing that some of these chemicals, particularly endocrine disrupting chemicals even at very low doses, may have significant environmental and human health impacts. These impacts include cancer, reproductive and developmental impairments, and learning and behavioural difficulties, particularly in growing children. Effective binational policy response to manage these chemicals is urgently needed. The new GLWQA should drive action on these chemicals by the greatest contributors. For instance, a soon to be released report from PollutionWatch shows that Canada’s industry contribute almost three times the number of industrial carcinogens to the airshed of the Great Lakes-St. Lawrence River basin than U.S. facilities.

The new Great Lakes Water Quality Agreement may be rewritten in order to limit its provisions to principles and goals so that it does not go out of date and need to be reviewed so often. This does not eliminate the need to continue to enhance and modernize the measures dealing with toxic contamination. We recommend that specific objectives contained in Annex 1 and other Annexes of the

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<sup>2</sup> Ministry of the Environment. PIBS 7269e Survey of Pharmaceuticals and Other Emerging Contaminants in Untreated Source and Finished Drinking Water in Ontario, page 27.

current Agreement be retained and enhanced to address substances of emerging concern, and specify action plans and reporting on progress on all substances.

CELA agrees that there needs to be flexibility that allows timely action on newly identified problems to prevent further harm to the ecosystem. The Annexes should be reviewed more frequently and there should be flexibility to add new provisions to address new concerns.

### **VIRTUAL ELIMINATION MUST REMAIN A CORNERSTONE OF THE GREAT LAKES WATER QUALITY AGREEMENT IN THE BODY OF THE AGREEMENT AND ITS ANNEXES**

The GLWQA was designed to address toxic chemicals from industrial sources primarily. The Agreement is inadequate to ensure that newly identified chemicals of emerging concerns and the ongoing challenge of persistent toxic chemicals from industrial sources will not continue to erode the quality of the Great Lakes Basin.

To effectively identify and manage toxic chemicals in the Great Lakes Basin, the government should reaffirm their commitment towards a preventative and precautionary approach in the identification and management of these chemicals. This approach will require governments to build in additional provisions to operationalize a preventative and precautionary approach in regulation and programs to implement the Agreement.

The Agreement should aim to protect human health and the Great Lakes environment from persistent toxic chemicals and all chemicals that are found to be carcinogenic, reproductive and developmental toxicants, endocrine disruptors and neurodevelopmental toxicants through elimination and prevention. Towards this commitment, we strongly urge the government to retain and strengthen principles of “prohibition” (described in Article II, Purpose); “virtual elimination” (described Article II, Purpose; Annex 1, Specific Objectives Supplement to Annex 1) “prevention” (described in Annex 12); and “zero discharge” (described in Annex 12). We support the definition and interpretation of the International Joint Commission on virtual elimination as outlined in the Sixth Biennial Report on the Great Lakes Water Quality Agreement. In this report, the Commission stated:

*“If a chemical or group of chemicals is persistent, toxic and bioaccumulative, we should immediately begin a process to eliminate it. Since it seems impossible to eliminate discharges of these chemicals through other means, a policy of banning or sunsetting their manufacture, distribution, storage, use and disposal appears to be the only alternative”.*<sup>3</sup>

The mechanisms required to eliminate and prevent the use, manufacture, release, import and disposal of these chemicals should include:

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<sup>3</sup> International Joint Commission. Sixth Biennial Report Under the Great Lakes Water Quality Agreement of 1978 to the Governments of the United States and Canada and the State and Provincial Governments of the Great Lakes Basin.

- A statement in the Agreement which recognizes the need to protect human health, wildlife health as well as aquatic health in the Great Lakes basin;
- The use and implementation of the precautionary principle;
- The development of an identification and elimination management strategy is necessary to insure this principle is actually applied. A report prepared by the Parliamentary Library in 2006 *Virtual Elimination of Pollution from Toxic Substances* makes the point that even though virtual elimination was carried from the GLWQA into the provisions of the Canadian Environmental Protection Act, “To date no substance has been targeted under CEPA 1999 for virtual elimination, and only one proposed, hexachlorobutadiene”. Thus, while the Government of Canada partners with the governments of the United States and Ontario to virtually eliminate a list of agreed-on substances specified in the GLWQA and Binational Strategy, (12) it has not used section 65 of CEPA 1999 to do so”. Furthermore, the report commentary noted that:

*“With respect to CEPA 1999, placing a substance on the Virtual Elimination List is mandatory for substances that the Ministers deem toxic, persistent, bioaccumulative and primarily man-made. The TSMP and CEPA 1999 both weakened the concept of virtual elimination somewhat by removing naturally occurring elements and substances such as mercury from the list of targeted substances and by raising recommended thresholds for defining persistence. They also target only substances that are persistent and bioaccumulative. This means that substances that are toxic and persistent but do not bioaccumulate are not targeted for virtual elimination under the Act. The GLWQA and the IJC recommendations, however, target all persistent toxic substances”.*<sup>4</sup>

We urge the government to adopt the interpretation of the IJC on virtual elimination as the CEPA definition has proven to promote traditional end-of-pipe control measure rather than prevention at source.

a) The identification process would apply most stringent criteria for persistence, bioaccumulation, etc. that reflect the most levels applied by other jurisdiction such as the European Union (See Appendix 1 - Comparison of criteria used to determine persistence, bioaccumulation and toxicity); and

b) The elimination strategy should require action plans for elimination relying on prohibition and other pollution prevention strategies, use of non toxic substitution or processes and use of green chemistry to achieve source reduction and elimination of toxic chemicals. One jurisdiction, Ontario, has a new Toxic Reduction Law that will require large emitting facilities to prepare and report on progress on Toxic Reduction Plans.

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<sup>4</sup> Tim Williams. Virtual Elimination of Pollution from Toxic Substances. Publication no. - PRB 06-26E. 26 July 2006.

- Ensure strong provisions of prevention and elimination on sources of air deposition to the Great Lakes basin
- The same principles and approach proposed above should be applied to toxic chemical loadings in contaminated sediments in the Great Lakes basin.
- Require regular binational reporting on inputs of toxic chemicals into the Great Lakes Basin from all sources – direct and indirect sources (including contributions from cosmetics, consumer products, pharmaceuticals and agriculture sources) and establishment of an inventory to understand the use of chemicals in the Great Lakes basin.
- Establish effective monitoring and biomonitoring programs.

**CANADA'S CHEMICAL MANAGEMENT PLAN AND OTHER TOXIC MANAGEMENT PROGRAMS ARE NO SUBSTITUTE FOR ECOSYSTEMIC PROGRAMS TO ADDRESS HISTORIC AND CONTINUAL POLLUTION TO CANADIAN WATERSHEDS.**

Risk Assessments on individual chemicals such as those conducted under Canada's Chemical Management Plan cannot show how these individual chemicals will act once in the environment of the Great Lakes where they may interact with other chemicals producing synergistic impacts. There is no specific focus under the CMP to address challenges from chemicals to the Great Lakes ecosystem. It is also well known that many of these chemicals biomagnify and concentrate as they move up the food chain to higher predators. Other complicated and confounding reactions with toxics have been caused by the introduction of aquatic invasive species. For instance while the introduction and spread of zebra mussels throughout the ecosystem resulted in clearer water due to their large filtering capacity, now the zebra mussels washing up on all our beaches and shores have become repositories for toxins.

**NEW APPROACHES TO OLD PROBLEMS MAY PROVE TO BE EFFECTIVE**

- **WATERSHED APPROACHES TO GREAT LAKES PROTECTION**

Implementation of watershed based water resource management and protection programs to minimize negative impacts on the lakes from land uses and tributaries within whole basins has promise for local cleanup and prevention efforts to ensure tributaries and groundwater do not continue to contaminate the Great Lakes surface waters. This extends the protection and prevention efforts beyond the boundaries of the RAP Areas of Concern and Lakewide Management plans to the whole Great Lake Watershed. Care will need to be taken in the Agreement definitions to ensure that watershed activities can be integrated with Great Lakes Agreement efforts.

Establishment of priority approaches to reducing contaminant loadings to the Great Lakes from both upstream tributary as well as near shore sewage treatment plants, combined sewer overflows, and storm-water management systems, including establishment of strong effluent standards should be part of watershed approaches. This should include programs to reduce near shore flows of contaminated water.

Watershed Management programs allow much more local stakeholder involvement and commitment to the restoration and protection of their local watersheds and recognition of their connection to the greater ecosystem. It could be a way to build constituencies for Great Lakes protection and provide successful models for the whole system solutions.

### **ENSURING CLEAN AND SAFE DRINKABLE WATER FOR THE GREAT LAKES BASIN POPULATION**

We have taken drinking water for granted in the Great Lakes. Most of the remedial action plans relied on drinking water treatment as a given and emphasised potability and threats from pathogens and from aesthetic parameters such as taste and odour and algal blooms. Little attention has been paid to threats of contamination from toxic chemicals where the approach has focused on dilution to address threats from chemicals rather than prevention at sources. However, as we have pointed out these systems are largely not equipped to remove many toxic and new emerging substances of concern. Drinking Water Source Protection is considered by many to be a preferable option. There is a need to establish strong connections and strengthen Great Lakes programs and drinking water protection programs (e.g. Ontario's Source Protection Program through their Clean Water Act). This is important because one third of Canadians depend on the Great Lakes for their drinking water.

Radiological threats to the Great Lakes need to be strengthened in the GLWQA as the nuclear power plants lining the Lakes age, nuclear waste volumes grow and as new nuclear facilities are being considered by Great Lakes jurisdictions. The health implications of these facilities need to be recognized in the Agreement and reporting on the presence of radionuclides needs to be required by the Agreement.

Drinking water supplies are fast becoming an issue in the Great Lakes. The pollution of ground and surface supplies contribute to diminishing these supplies. This makes pollution prevention imperative particularly in a time when it is projected that climate change will considerably diminish tributary flow, and water levels in the Great Lakes.

### **CLIMATE CHANGE, TOXICS AND HEALTH IN THE GREAT LAKES**

Strong provisions for monitoring and predicting impacts of continued climate change on Great Lakes waters should be set out in the Agreement. Vulnerability studies and mapping should consider all aspects of climate change impacts on the land and waters in the region and on the health of all components of the ecosystem. Thermal changes, changes in the concentrations of toxics and implications for biodiversity should be part of these studies. Mediating impacts should be a criteria for these action plans.

Provisions are needed for improving and protecting infrastructure investments, including drinking water and waste water systems, from impacts of climate change, and for protecting the Great Lakes from increased impacts from those systems as a result of climate change.

We strongly feel that prevention of further Great Lake region contributions to climate change should be encouraged by Agreement provisions. Prevention is also an adaptation strategy.

## **MULTIPLE STRESSORS REQUIRE CONTINUOUS, MULTIPLE, SIMULTANEOUS AND INTEGRATED SOLUTIONS**

There is a view expressed by some that we need to spend on one problem at a time in the Great Lakes and that in difficult economic times only one priority should be funded. We strongly disagree with this view. Indeed, we may no longer have the luxury of focusing programs and funding for the Great Lakes on one program area. As stressors to the Lakes have grown, there is evidence we are well beyond being able to identify one effect that can be eliminated by a single causal action. Scientists can no longer explain complex reactions in Lake Erie that have led to a resurgence of eutrophication and decline in the health of that Lake. Clean-up of contaminated sediments in the AOCs which get resuspended into the water column, and are then available for biological uptake must continue to be a priority even though local contributions to that clean-up may not be possible as is the case in Hamilton Harbour. Improved sewage treatment systems that remove toxics must be considered when infrastructure grants are given to Great Lakes municipalities, and further pollution must be prevented wherever possible. Virtual elimination of persistent and bioaccumulative substances must be rigorously pursued. At the same time the introduction of invasive species and perhaps temperature changes in Lake Erie are thought to be multipliers of degradation and impacting the fate of toxics. We are at risk of compounding ecosystem problems by not addressing all stressors in an integrated manner.

## **ENHANCE SCIENCE AND DATA GATHERING ON AQUATIC, WILDLIFE AND HUMAN HEALTH IN THE GREAT LAKES ECOSYSTEM**

There seems to be agreement that science has not kept pace with the challenges to the health of the Great Lakes. While some rely on the *State of the Great Lakes* reports and conferences for this information, CELA feels these are not comprehensive or strategic and thorough examinations of all stressors, their pathways and their cumulative impacts and interactions on the ecosystem. Plans for a new science strategy that assists in establishing priorities should be set out in the revised Agreement.

## **ADEQUATE PUBLIC ENGAGEMENT ON PROPOSALS FOR TOXIC CHEMICALS IN THE GREAT LAKES**

A renewed Great Lakes Water Quality Agreement should have provision for a more inclusive and democratic involvement of key stakeholders in policies and programs that impact the region they reside in. First Nations and Tribes should be given special status as should municipalities who often have to address the toxic burden in their local regions. CELA has made separate submissions on governance which have included suggestions on mechanisms to achieve these goals.

The public should be given access to all further consultations on toxics in the Great Lakes and in the new Great Lakes Water Quality Agreement. We are at a crucial turning point where the public is calling for a reduction of toxics in all aspects of their lives, in products they use, in their homes and neighbourhoods, workplaces and in the environment. The new Great Lakes Water Quality Agreement needs to reflect these prerogatives.

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**Appendix A:** Comparison of criteria used to determine persistence, bioaccumulation and toxicity under *Great Lakes Water Quality Agreement (GLWQA)*, European Union (EU) *Registration, Evaluation and Authorisation of Chemicals (REACH)* program, Canada's CEPA Chemicals Management Plan (CMP), U.S. EPA Chemicals Assessment and Management Program (ChAMP), and *Stockholm Convention on Persistent Organic Pollutants*

Criteria	GLWQA, 1989	EU REACH	Canada's CEPA CMP	U.S. EPA PBT and ChAMP	Stockholm Convention on Persistent Organic Pollutants*	Conclusion
<b>1.PERSISTENCE (P)</b>  Half –life in fresh water	> 56 days  (8 weeks)	> 40 days  (5.7 weeks)	>=182 days  (26 weeks)	>= 60 days (8.5 weeks)  considered persistent, moderate hazard  Not persistent if half life <60 days, low hazard	>60 days (two months /8.5 weeks)	GLWQA, REACH,  EPA at least three times more stringent than CMP
Half life in marine water		>60 days				CMP does not set more protective criteria for freshwater
Half life in soil		>120 days	>=182 days		>six months (approx. 180 days/26 weeks) (soil)	
Half life in sediment		>120 days	>=365 days	>=60 days	> six months	REACH two times more

Criteria	GLWQA, 1989	EU REACH	Canada's CEPA CMP	U.S. EPA PBT and ChAMP	Stockholm Convention on Persistent Organic Pollutants*	Conclusion
		in freshwater sediment or		considered persistent, moderate hazard  Not persistent if half life <60 days, considered low hazard	(approx. 180 days/26 weeks)	stringent than CMP
		Half life of >180 days in marine sediment				
Half life in air			>=2 days  or is subject to atmospheric transport from its source to remote place		>2 days	Only CMP and Stockholm Convention evaluate persistence using air half life
VERY Persistent (vP)		>60 days in marine or freshwater or	No "very persistent" category	>190 days in water, soil and sediment, considered high hazard		CMP does not have vP category

Criteria	GLWQA, 1989	EU REACH	Canada's CEPA CMP	U.S. EPA PBT and ChAMP	Stockholm Convention on Persistent Organic Pollutants*	Conclusion
Half life in water						
Half life in sediment		>180 days in marine or freshwater sediment or		>190 days in water, soil and sediment, considered high hazard		Like vP threshold, Canada does not establish a criteria for vP in sediment
Half life in soil		>180 days				
2. <b>BIOCONCENTRATION</b> <b>(B)</b>		BCF > 2,000	BCF ≥ 5,000  or BAF ≥ 5,000  or Log K <sub>ow</sub> ≥ 5	BCF ≥ 1,000 or BAF ≥ 1,000 considered bioaccumulative and moderate hazard  or  BCF < 1,000 or BAF < 1,000 considered not bioaccumulative and low hazard	BCF > 5,000  or Log K <sub>ow</sub> > 5	REACH established  BCFs that are two and half times more stringent than CMP  U.S. EPA PBT five times more stringent than CMP

Criteria	GLWQA, 1989	EU REACH	Canada's CEPA CMP	U.S. EPA PBT and ChAMP	Stockholm Convention on Persistent Organic Pollutants*	Conclusion
				Log K <sub>ow</sub> >4		
VERY Bio accumulative (vB)		BCF>5,000	Same as bioaccumulative category in CMP	BAF or BCF>=5,000 considered bioaccumulative and high hazard.		
<b>3. TOXIC</b> <b>(iTe)</b> Chronic		Chronic NOEC < 0.01 mg/l	Chronic NOEC <= 0.1 mg/l	Chronic (ChV or LOEC) <0.1 mg/l considered high hazard  Chronic (ChV or LOEC) <0.1 to 10 mg/l considered moderate hazard  Chronic (ChV or LOEC) >10 mg/l considered low hazard	Not restricted to aquatic environment. Evidence of adverse effects to human health or to the environment ... Or toxicity or ecotoxicity data that indicated the potential for damage to human health or to the environment	REACH ten times more stringent than CMP  CMP classifies chemicals as toxic, which would be classified as high hazard under EPA  CMP no moderate or low hazard category
Acute	Acute LC50	Short term LC50 or EC50 <0.01 mg/l	Acute LC50 (EC50)<=1 mg/l	Acute LC50 (EC50)<=1 mg/l		GLWQA twice as stringent as CMP

Criteria	GLWQA, 1989	EU REACH	Canada's CEPA CMP	U.S. EPA PBT and ChAMP	Stockholm Convention on Persistent Organic Pollutants*	Conclusion
	< 0.5 mg/l are considered hazardous substances are also other measures	(Definitely fulfilled)  Short term LC50 or EC50<0.1 mg/l				U.S. EPA same as CMP

\* Note: Under the Stockholm Convention on POPs, persistence under Stockholm convention also includes “evidence that the chemical is otherwise sufficiently persistent...”. For bioaccumulation, “evidence that a chemical presents other reasons for concern, such as high bio-accumulation in other species, high toxicity or ecotoxicity; or monitoring data in biota...”

Sources:

- *Great Lakes Water Quality Agreement*, 1987, Annexes 10 & 12.
- Technical Guidance Document REACH. Guidance on information requirements and chemical safety assessment. Part C. PBT Assessment. (European Chemical Agency, May 2008). Government of Canada, *Persistence and Bioaccumulation Regulations*, S.O.R./2000-107, C. Gaz. II 134 no. 7 (March 29, 2000). See: [canadagazette.gc.ca/partII/2000/20000329/html/sor107-e.html](http://canadagazette.gc.ca/partII/2000/20000329/html/sor107-e.html).
- Toxicity from Environment Canada's Ecological Categorization Criteria and Process.
- U.S. EPA Category for persistent, bioaccumulative and toxic new chemical substances Federal Register November 4, 1999 volume 64, number 213 pages 0194-60204 Used for moderate production volume chemicals in ChAMP program.
- United Nation Environment Program. *Stockholm Convention on Persistent Organic Pollutant Text and Annexes*, Annex D.

Appendix A Source: Canadian Environmental Law Association and Lowell Center for Sustainable Production. *The Challenge of Substances of Emerging Concern in the Great Lakes Basin: A review of chemicals policies and programs in Canada and the United States*, A report prepared for the International Joint Commission Multi-Board Work Group on Chemicals of Emerging Concern in the Great Lakes Basin, June 2009