# Great Lake Regional Collaboration PBT Group

## I. Problem Statement

The Great Lakes are vulnerable to persistent toxic substance (PTS) because of their long hydraulic retention times, large surface area, and proximity to large population centers. Sources of most PTS are primarily anthropogenic. Historical PTS have declined significantly in Great Lakes fish following the ban on PCB manufacturing and canceling or suspension of some particularly harmful pesticides. However, concentrations of these chemicals remain high enough to warrant fish consumption advisories across the basin and continue to pose threats to human and wildlife health. Recently, researchers have documented the presence of additional chemicals that may also pose a threat to human and wildlife health. The characteristics of these substances are not fully understood, such as persistence, fate, transport, food web bioaccumulation, and toxicity. These substances may not be fully addressed by PTS related programs, nationally or in the Great Lakes Basin.

## II. Goals

- Prevent the release of toxic substances in toxic amounts, and virtually eliminate the release of any or all persistent toxic substances to the Great Lakes Basin Ecosystem.
- Allow unrestricted consumption of fish from the Great Lakes Basin Ecosystem.
- Clean up all sediments and other reservoir sources contaminated with persistent toxic substances in the Great Lakes Basin Ecosystem.
- Protect the general public from toxic substances through effective and consistent outreach and education, including consistently protective fish consumption advice throughout the Great Lakes Basin Ecosystem.
- Protect the health and integrity of wildlife and its habitat from physical, chemical and biological changes associated with the release of persistent toxic substances.

## III. Ongoing Efforts

A number of ongoing program activities currently address PTS in the Great Lakes, including regulatory programs, pollution prevention/voluntary programs, existing Great Lakes toxics programs, clean up and remediation programs, education and outreach, and assessment. A series of short white papers describing these programs is appended

## IV. Recommended Actions

### Chemical Screening

- Create a central body or clearinghouse for chemical screening information from various screening programs (integrate into IRIS?)
- Use wildlife health criteria for PBTs in chemical screening programs, including the PBT Profiler.
- Develop incentives for industry to share QSARs for PBTs (Note: Need to clarify.)

- Developed improved QSARs.
- Implement the National Pollution Prevention and Toxics Advisory Committee's (NPPTAC) P2 chemical management tool box in a pilot project for the Great Lakes region.
- Develop an emerging chemical "watch list" for GL monitoring programs using predictive tools such as the PBT Profiler and QSARs.

**Education and Outreach**

- Expand existing national burn barrel outreach scale-up effort via the PBT Program or other program.
- Develop uniform fish consumption advice for the Great Lakes and issue uniform advice to citizens and health care workers in multiple languages.
- Identify gaps in education and outreach information in order to determine where the message is unsuccessful and why by creating benchmarks to determine behavior change.
- Scale up successful PBT outreach programs.
- Develop a consistent and easily accessible message (basin-wide) regarding the presence and possible health effects of PBT and ways to reduce their output (Topics including fish consumption advisories, mercury thermometers, energy conservation, and burn barrels.)
- Ensure through outreach and education efforts that Great Lakes residents are aware of disposal options for waste pesticides and that local collection programs are aware of proper handling methods.

**Monitoring and Indicators**

- Develop standardized analytical methods for selected chemicals of emerging concern.
- Analyze fish contaminant monitoring program archives for chemicals of emerging concern.
- Provide additional funding for monitoring of emerging contaminants and dioxins in Great Lakes State and Tribal fish monitoring programs.
- Develop an integrated multimedia monitoring program for at least 2 representative waterbodies with different mercury methylation capacities (ex. Upstate NY and Upper Peninsula of MI) to assess their response to mercury emission reductions.
- Fund research to determine the link between anthropogenic mercury emissions (local, regional, international) and concentrations of mercury in fish (Occurring for Lake Ontario?)
- Identify and eliminate other sources of PCBs to the Great Lakes.
- Collaborate with wastewater treatment plants in the Great Lakes basin to develop a surveillance program to assess the presence and significance of pharmaceuticals/EDCs/PCPs in final effluent, sewage sludge, and affected

tributaries. Determine the human health and environmental threats associated with these chemicals.

- Create a Great Lakes HANES (Health and Nutrition Examination Study), including analysis of emerging chemicals of concern and foci on sensitive populations
- Improve AOC-specific monitoring and better utilize existing AOC monitoring data
- Assess current monitoring programs to identify opportunities to save costs by 1) decreasing monitoring frequency; 2) decreasing monitoring locations; and/or 3) switch to cheaper monitoring methods (e.g., passive air samplers) for chemicals for which sources declined substantially, concentrations are below identified risk levels and currently show little unpredictable spatial or temporal variation.
- Assess and ensure in-use analytical guidelines for PBTs are current and accurate.
- Establish a baseline inventory of State and Tribal PBT Monitoring Efforts (Refer to those who maintain existing monitoring inventories, e.g., Great Lakes Binational Monitoring Inventory.)
- Continue and expand usage of the SOLEC process as a regional forum for developing any additional PBT indicators that are needed and assessing and reporting on indicators.
- Ensure funding for adequate monitoring coverage in space, time and chemicals-of-concern for each of the current PBT indicators. (Reference current GL funding bills in Congress?)
- Track information from State and national programs that monitor PBTs in food

**Modeling, Forecasting, and Risk Assessment**

- Develop risk assessments for emerging contaminants of concern and grandfathered contaminants.
- Develop fate and transport models for selected emerging contaminants.
- Conduct additional modeling exercises and collect related monitoring data for PBT contaminants that drive fish consumption advisories for all lakes and address AOCs; formalize a regular input of monitoring data into models.
- Study the effect of food web changes on contaminant transfer (are old food web models still accurate?).

**Pollution Prevention**

- If a human or environmental threat is presented by discharges of pharmaceuticals/EDCs/PCPs in wastewater effluent, sewage sludge, or affected tributaries, develop appropriate tools (e.g. treatment requirements/effluent limit regulations, pre-discharge reduction programs) to reduce the discharges of these chemicals in effluent and sewage sludge.
- Provide funding and support to improve garbage collection and disposal capacity in municipalities in the GL basin as needed to prevent burning, burying and dumping of solid waste.

- Implement pay-as-you-throw trash disposal fees throughout the Great Lakes basin. (Would this pay for improved disposal or recycling programs?)
- Pass legislation requiring product stewardship by manufacturers for the full lifecycle of their products.
- Support legislation that promotes the use of green chemistry and design for the environment principles in development of new chemicals for commerce.
- Promote collaborative efforts to reduce toxics through re-design along the supply chain, particularly through the efforts of sectors/industry associations.
- Provide information and funding to municipalities to implement programs including auto switch recovery and mercury thermometer disposal.
- Provide funding to establish permanent Clean Sweep Programs in each Great Lakes State.
- Provide funding to strengthen infrastructure for general recycling programs in municipalities.
- Provide funding to establish permanent Household Hazardous Waste collection sites in each Great Lakes State.
- Provide funding to establish electronic waste recycling programs in municipalities.
- Provide national and regional leadership, examples and case studies for mercury emission reductions through end-of-stack treatment, alternative sources of energy, energy conservation, product substitution, product stewardship and other mercury reduction methods. (Note: BTS is doing some of this.)
- (Alternative to mandatory phase-out.) Provide assistance and incentives to accelerate phase-out of PCB bearing equipment. For example, provide guidance on identifying PCB bearing equipment in utilities' inventories, secure lower insurance rates for PCB free facilities or provide grants for testing, replacement and disposal of PCB bearing equipment.
- Continue and maintain support for GLBTS activities, including PBT product phase-outs, pollution prevention activities, tracking trends in the environment, improving emissions inventories, and determining contributions from local, regional, and global sources of PBTs.
- Promote the use and purchase of energy from alternative sources such as bio-mass and wind to reduce airborne combustion sources of lead and mercury. Promote use of hybrid vehicles.
- Implement a mercury utility emissions trading demonstration project within the Great Lakes basin that encourages new or expanding clean power facilities to replace existing dirtier utility emissions.

**Legislative/Regulatory**

- Develop more stringent emissions controls on power plants in the Great Lakes States. (OR use proposed MN legislation: Reduce mercury contamination by reducing the release of mercury into the air and water. Require electricity generating coal-fired units 25MW or larger, by 2009, to reduce mercury emissions by 90% from 1990 levels for most units, or by 70% for those units with

wet scrubbers. By 2015, all electricity generating coal-fired units 25MW or larger must reduce mercury emissions by 90% from 1990 levels.)

- Implement mandatory phase-out of in-use PCB electrical equipment and hydraulic fluids (including lower concentration threshold).
- Create a new lower-threshold disposal land disposal restriction (LDR) for PCBs under RCRA (revoke 50 ppm level found to be not protective).
- Fully fund and implement existing PBT regulatory programs and authorities while considering human health risk. Eg. Residual risk assessment of clean air act, including risk via consumption of contaminated fish/food.
- Placeholder for breaking down existing PBT regulatory programs (name specific programs that need resources).
- Reauthorize Superfund tax.
- Implement basinwide prohibition of waste burning.

**International**

- Address international sources of mercury, including small scale gold mining and transfer of Hg reduction technology from U.S. chlorine industry to chlorine factories in other countries.

**Toxicological Research**

- Develop water quality and fish tissue criteria for human health consumption and water quality criteria for aquatic life and recreation for selected emerging chemicals of concern as warranted.
- Complete toxicological database for emerging contaminants of concern and grandfathered contaminants.
- Assess human toxicity of mixtures of chemicals through multiple routes.
- Conduct epidemiological studies that take a broad-based, community or population level approach at determining more reliable assessments of risk associated with low-level exposure to Great Lakes contaminants (ex. Health Canada report about morbidity and mortality in AOCs vs. other areas)
- Determine effects of multiple stressors on humans (i.e. are effects of contaminant exposure greater on children who already have a disease?) and other organisms (i.e. are observed contaminant exposure effects greater in organisms experiencing habitat loss?)

**Cross-cutting with AOC Team**

- Develop alternative contaminated sediments disposal technology (in-situ vs. dredging).
- Fund clean-ups of contaminated sediments in the Great Lakes, which are a significant source of PBTs to the Lakes, particularly PCBs.
- Improve AOC-specific monitoring and better utilize existing AOC monitoring data