Toxic Contaminants Policy and Prevention

Goal

Continually improve practices and controls that reduce and prevent the effects of toxic contaminants below levels that harm aquatic systems and humans. Build on existing programs to reduce the amount and effects of PCBs in the Bay and watershed. Use research findings to evaluate the implementation of additional policies, programs and practices for other contaminants that need to be further reduced or eliminated.

Factors Influencing Success

The following are natural and human factors that influence the Partnership's ability to attain this outcome:

- Broad geographic extent and distribution of toxics
- Toxics can be separated into 3 broad categories—metals, hydrophobic organics, hydrophilic organics—that can behave differently to BMPs and other restoration practices
- Use of herbicides and pesticides in agricultural and lawn maintenance
- Political will to modify regulatory programs and/or create voluntary programs
- High cost of remedies: in-stream sediment remediation; waste water source trackdown studies; electrical equipment replacements; stormwater controls; contaminated site remediation
- Variety of sources and pathways for toxics entering the environment that necessitate a wide-range of very different management responses (e.g., primary sources such as faulty electrical equipment and herbicide/pesticide application, secondary sources such as wastewater treatment by-products, and pathways such as stormwater runoff)
- Knowledge gaps on relative sizes of sources

Resulting Scoring Narrative

While the Toxic Contaminants Policy and Prevention Outcome places an emphasis on PCBs, the outcome also seeks to improve practices and controls that reduce and prevent the effects of other classes of toxic contaminants. In scoring each category of best management practices (BMPs), the predominant class of contaminant of concern was identified for each source sector (e.g., pesticides for agriculture) and a score was developed based upon the BMP's potential impact upon that contaminant class (e.g., pesticides). These classes are listed below with the identified sectors. Where monitoring data or modeled data were available, they were used in developing the scores. However, the complexity of factors often require best professional judgement (BPJ) to discern the differences between some scores. For instance, multiple different combinations of practice effects could lead to judgments that a 4 is warranted instead of a 3 or 5.

Value	Score	Score Narrative for Toxic Contaminants Policy and Prevention
5	Substantial Improvement	Practice has potential to substantially decrease the delivery of toxic contaminants to waterbodies.
4	Moderate to Substantial Improvement	Somewhere between 3 and 5 → BPJ
3	Moderate Improvement	Practice has potential to moderately decrease the delivery of toxic contaminants to waterbodies.
2	Slight to Moderate Improvement	Somewhere between 1 and 3 → BPJ

1	Slight Improvement	Practice has potential to slightly decrease the delivery of toxic contaminants to waterbodies.
0	No Effect	Practice has no impact on toxic contaminants policy and prevention.
-1	Slight Worsening	Practice has potential to slightly increase the delivery of toxic contaminants to waterbodies.
-2	Slight to Moderate Worsening	Somewhere between -1 and -3 → BPJ
-3	Moderate Worsening	Practice has the potential to moderately increase the delivery of toxic contaminants to waterbodies.
-4	Moderate to Substantial Worsening	Somewhere between -3 and -5 → BPJ
-5	Substantial Worsening	Practice has the potential to significantly increase the delivery of toxic contaminants to waterbodies.

Toxic Contaminant Classes

Contaminant Group	Sector	Extent, Severity, and Sources
Polychlorinated biphenyls (PCBs)	Urban	PCBs have widespread extent and severity. The severity was based on risk to human health through consumption of contaminated fish with impairments identified in all of the watershed jurisdictions. Some primary sources are contaminated soils, leaks from transformers, and atmospheric deposition.
Mercury		Mercury had both widespread extent and severity. The severity was based on risk to human health through consumption of contaminated fish. The primary source is air emissions from coal-fired power plants.
Polycyclic aromatic hydrocarbons (PAHs)	Urban	Widespread extent throughout the Bay watershed. The severity was localized based on impairments for risk to aquatic organisms in a limited number of areas in the watershed. The primary sources are contaminated soils, road sealants, atmospheric deposition, and combustion.
Pesticides	Ag, Urban, Forestry?	Widespread extent of selected herbicides (primarily atrazine, simazine, metochlor, and their degradation products) and localized extent for some chlorinated insecticides (aldrin, chlordane, dieldrin, DDT/DDE, heptachlor epoxide, mirex). The chlorinated insecticides have localized severity based on risk to aquatic organisms. For many pesticides that had widespread occurrence, water-quality standards were not available to determine impairments. Research shows sublethal effects for some compounds at environmentally relevant concentrations. Primary sources are applications on agricultural and urban lands and legacy residue in soils.
Petroleum hydrocarbons	Urban	Localized extent and severity (to aquatic organisms) in a limited number of areas in the watershed.
Dioxins and Furans		Localized extent and severity (to aquatic organisms) in a limited number of areas in the watershed. The primary sources are spills, contaminated soils, and atmospheric deposition.
Metals and Metalloids	Urban	Localized extent and severity (to aquatic organisms) of some metals (aluminum, chromium, iron, lead, manganese, zinc) in a limited number of areas in the watershed. The primary sources are spills, industrial processes, and atmospheric deposition.
Pharmaceuticals, Household and Personal Care Products, Flame Retardants, Biogenic Hormones	Urban, Septics	Information was not adequate to determine extent or severity. However, their use in the watershed suggests widespread extent is possible. Severity was not accessed but research shows sublethal effects to selected aquatic organisms for some compounds at environmentally relevant concentrations. Range of sources from wastewater treatment and septic tanks to animal feeding operations. Biogenic hormones assessment was focused on naturally occurring compounds from human or animals.