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(Transmission by email)

Dear Ms. Klevs and Ms. Mitchell,

We are providing these comments, including on behalf of National Wildlife Federation, Canadian Environmental Law Association, and Toxics Free Great Lakes Network, on the draft *Great Lakes Binational Strategy for Mercury Risk Management* (April 2018, hereafter “Mercury Strategy”). We are offering several general observations and recommendations to the Parties on the Mercury Strategy, as well as a few additional observations and recommendations, as summarized below.

- 1) The Mercury Strategy should identify early on ongoing concerns with mercury in the Great Lakes.

The Executive Summary of the Mercury Strategy would benefit from a paragraph outlining the ongoing concerns with mercury, including the extent of fish consumption advisories (as noted later in the Strategy), the potential human health and ecological concerns, and the fact that though progress has been made, more work can be done to reduce mercury levels in the Great Lakes ecosystem.

- 2) Reducing and virtually eliminating mercury requires a binational commitment to both Great Lakes Basin-specific actions and targets and tracking of progress.

The proposed Mercury Strategy emphasizes activities already underway in both countries to address mercury releases, and many activities are laudable. However, the Mercury Strategy should also more clearly indicate Great Lakes Basin-specific actions that can be taken to reduce and eliminate mercury releases in the Basin. In addition, the Mercury Strategy should include

specific reduction targets (which could be both for national action and Basin-specific activities) and an approach to track activities, to ensure progress is made towards virtual elimination of mercury.

3) Timelines are needed to ensure progress and accountability regarding proposed actions.

The Mercury Strategy does not include timelines associated with activities proposed, noting "While the GLWQA does not provide timelines for strategy implementation, the strategy should be reviewed periodically. Please note that during the time frame of re-evaluation, no new chemical nominations will be accepted." (Introduction of the strategy, p. 1). As we noted in comments on the draft strategy on polybrominated diphenyl ethers (PBDEs), we have concerns about implications of the statement concerning new chemical nominations. In addition, as also noted in previous comments, even though the GLWQA does not outline timelines in the measures to be considered, regular reporting is required, and we believe having timelines would obviously help in assessing progress through Strategy implementation.

4) Ensure all key existing activities in the U.S. and Canada affecting mercury are emphasized in the Strategy, including in the Executive Summary.

We see three related issues that should be addressed to better indicate how work through the Mercury Strategy will contribute to ultimate objectives concerning mercury in the Great Lakes Basin:

- A. The Executive Summary should summarize both key activities underway as well as new activities that will contribute to ultimate objectives concerning mercury in the Great Lakes Basin, rather than emphasizing the categories of strategy options, general aspects of mercury contamination, and gaps concerning better understanding mercury in the environment.
- B. Table A in the Executive Summary should highlight all key actions underway in both countries to address mercury, and relevant to loadings in the Basin. For example, in the first column on regulatory and other actions, there is reference to continuing actions to reduce mercury emissions from coal-fired power plants, but emphasizing only Canada rather than both countries. Given the significant efforts that have gone in to developing and implementing the U.S. Mercury and Air Toxics Standards rule, continuing progress on the coal-fired power plant sector in the U.S. should be noted in this section as well (as well as in the summary box on p. 24).
- C. While it is important to evaluate the effectiveness of existing programs (e.g. first two items in the regulatory and other actions in Table A), it is important that the Strategy also note that any significant gaps identified involving mercury releases will be addressed subsequently by both governments.

5) There should be comparable description of key programs addressing mercury for both countries.

In Section 3 covering mercury management and programs, there is decent discussion of programs in both countries. However, in the case of guidelines and standards, the U.S. section (3.1.5) simply references the table compiling guidelines and standards (Table 7), whereas for Canada, Section 3.2.5 elaborates on Canadian guidelines and standards. It would be helpful to have similar elaboration for guidelines and standards on the U.S. side. In particular, Table 7 does not reference criteria developed through the Great Lakes Initiative process in the 1990s (which are still in place), including uniform water quality criteria guidelines for protection of human health and wildlife (https://www.epa.gov/sites/production/files/2015-12/documents/1995_water_quality_guidance_for_great_lakes_sid.pdf). These should be discussed, including in a brief narrative section in the main text.

As another example, in Section 3 on policies, regulations and programs, there is mention of Canadian work (Section 3.2) on products and mercury export relevant to commitments through the Minamata Convention, but there is no similar reference to these issues (in the context of the Convention) in Section 3.1 for the U.S.

One other area that could be further noted in the Strategy is the potential extent of sites with significant mercury contamination (e.g. in Areas of Concern, or for example, Superfund sites on the U.S. side), and the extent to which they may be contributing to elevated mercury levels in some areas of the region (and may need additional remedial work).

6) Discussion on exceedances of criteria and guidelines should be binational, and recognize both some of the science and policy limitations as well as implications of exceedances.

Section 4.2 (p. 23) discusses examples of exceedances of environmental quality guidelines or other criteria. Several points should be recognized here: 1. Canadian environmental quality guidelines may not be protective of all aquatic biota potentially at risk from mercury exposure (e.g. higher trophic level fish, or wildlife consuming fish, as noted in the guidelines documents themselves – e.g., CCME, Canadian Water Quality Guidelines for the Protection of Aquatic Life – Mercury, 2003); 2. There is appropriate reference to widespread presence of fish consumption advisories (so with mercury levels exceeding thresholds), though it would be good to note the possibility that not all states on the U.S. side are necessarily using the same protocol for advisory issuance; 3. It is important to note on the U.S. side that exceedance of certain thresholds (e.g. of a water concentration-based water quality criterion or a fish tissue criterion) should lead to placement of water bodies on the state's list of impaired waters under the Clean Water Act (and thus needing total maximum daily load development).

7) Discussion on fish consumption risks and advisories should recognize more recent levels of concern.

The discussion on mercury in biota (Section 2.4.3.4) references the large number of fish sampled that fall below the threshold identified in the 1987 Great Lakes Water Quality Agreement. However, as discussed elsewhere in the report, the U.S. EPA subsequently developed a threshold that is lower (0.3 ppm in fish tissue), and a number of states and Ontario have had yet lower thresholds for beginning to issue fish consumption advisories. Further, epidemiological and other studies continue to identify health risks from what otherwise may seem to be “low” exposures, so it would be preferred if this section recognizes some of this more recent work.

8) The Parties need to highlight resource needs to carry out Annex 3 activities.

The Mercury Strategy notes that through the GLWQA, “...the Parties’ respective obligations are subject to the appropriation of funds in accordance with their respective procedures.” (Introduction section, page 1). Again as we noted in the recent comments on the PBDE Strategy, given the binational commitment the Parties have made through the GLWQA to address Great Lakes threats, it is important that the Parties highlight the importance of funding programs to meet objectives of the GLWQA. It is reasonable to ensure that those making decisions related to authorizing and appropriating funds recognize the importance of funding programs addressing mercury and other CMCs in the Great Lakes Basin.

9) Miscellaneous comments.

We have several specific comments on other aspects of the Mercury Strategy, as noted below.

Attention to nomenclature: The authors should review the document to ensure consistent use of terms and symbols. For example, in Section 2.3 (Sources and Releases of Mercury in the Great Lakes, p. 3, second paragraph), there is reference to a “... 30% decrease in anthropogenic Hg⁰ emission...” (globally), whereas the authors are presumably referencing elemental mercury, which should be indicated as either Hg[°] or Hg(0).

Attribution of mercury sources: In the brief discussion on sources and cycling (P. 3, second full paragraph), it is important to note in citing Lepak et al. 2015 that there is some conflating of vectors and sources. For example, there is reference to atmospheric, industrial, and watershed-derived sources. But it is important to note that mercury emitted from an industrial source (e.g. a chlor-alkali plant, or a coal-fired power plant, if considered among “industrial sources”) can be transported through the atmosphere, and then deposit on a water body (e.g. a Great Lakes). Some alternative terminology may be helpful (e.g., “direct industrial”).

Sources can release mercury in multiple forms: The Mercury Strategy (p. 4, fifth paragraph) notes that for taconite processing facilities, a substantial fraction of mercury released is in the

gaseous form (which is less likely to deposit locally). This appears to be the case for these facilities, but it should be noted this assertion in the cited report was based on testing at only one facility, and other work has noted that taconite facilities can potentially be the source of some regionally deposited mercury (Engstrom et al. 2007, *Limnology and Oceanography*, 52(6): 2467-2483).

Fish consumption advisories: Both the Executive Summary and the pollution prevention summary box (p. 26) reference efforts to “enhance public outreach and educate the public on how to obtain and implement site- specific fish consumption advisories.” We have two issues with the recommendation: 1. Overall efforts on fish consumption advisory outreach are important, but they would not really be considered “pollution prevention” efforts, given they are recommendations individuals should take because of pollution present. 2. It is really agencies that “implement” fish consumption advisories, and the public would heed or follow the advice. Thus, we believe the description of needed efforts should be modified accordingly.

Overview of risk: In the High Level Summary of Risks section (Section 2.5), it is worth briefly mentioning a few of the other human health and ecological concerns with mercury exposures; it is these concerns in particular that motivate efforts to reduce mercury uses and releases to the environment. Though earlier publications, two reviews that address both of these topics are Mergler, D., Anderson, H.A., Chan, L.H.M., Mahaffey, K.R., Murray, M., Sakamoto, M., Stern, A.H. 2007. Methylmercury exposure and health effects in humans: A worldwide concern, *Ambio*, 33(1):3-11; Scheuhammer, A., Meyer, M.W., Sandheinrich, M.B. Murray, M.W. 2007. Effects of environmental methylmercury on the health of wild birds, mammals, and fish, *Ambio*, 33(1):12-18.

Work under the Binational Toxics Strategy: While the Mercury Strategy appropriately notes the work of the earlier Binational Toxics Strategy (BTS) (p. 18), it is worth noting there was a separate Mercury Work Group that carried out a number of activities, including specific projects and extended workshops at BTS meetings.

Review data/information compilation in tables: In Table 1 (p. 34), reference should be to “Henry’s Law Constant” rather than “Henri’s Law”); in addition “constant” is the more conventional term rather than “coefficient”. In Table 5 (p. 36), the summary references PCBs rather than mercury. In Table 7 on standards and guidelines, as noted in point #5 above, there is no reference to criteria developed through the Great Lakes Initiative process in the 1990s (which are still in place), including uniform water quality criteria guidelines for protection of human health and wildlife. These criteria should be referenced in the table (https://www.epa.gov/sites/production/files/2015-12/documents/1995_water_quality_guidance_for_great_lakes_sid.pdf).

In summary, we appreciate the opportunity to provide these comments on the Mercury Strategy. As we have noted in comments on earlier strategy documents (including most

recently on PBDEs), it is important that these early strategy documents set the right tone for activities to be undertaken to meet objectives for chemicals of mutual concern under the Great Lakes Water Quality Agreement. We believe addressing the comments above can result in actions more likely to address ongoing concerns with mercury in the Great Lakes Basin.

Sincerely,



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