New England Governors/Eastern Canadian Premiers

Mercury Action Plan 1998

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Prepared by

The Committee on the Environment of
The Conference of New England Governors and Eastern Canadian Premiers

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Summary
In June 1997, the Conference of the New England Governors and Eastern Canadian Premiers (NEG/ECP) charged its Committee on the Environment to: "continue to advance the understanding of mercury in this region;" "support cooperative action...to begin to address mercury releases and resulting public health and environmental impacts;" and develop a regional Mercury Action Plan. A draft framework for the Mercury Action Plan was subsequently developed by representatives of the New England states and Eastern Canadian provinces. This draft was refined following the NEG/ECP Workshop on Acid Rain and Mercury in February 1998 in Portland, Maine.

The Conference of New England Governors and Eastern Canadian Premiers has concluded that aggressive and concerted actions are needed to reduce potential health risks attributable to mercury exposures and to expand scientific information on mercury sources, controls and environmental impacts. This conclusion is based on extensive scientific data that indicate that mercury is pervasive in freshwater fish in the Northeast at levels that pose plausible health risks to people and some species of fish eating wildlife. In addition to the potential health effects caused by this contamination, there are important economic consequences, including reducing the recreational and commercial value of fisheries resources across the region.

This Mercury Action Plan identifies steps to address those aspects of the mercury problem in the Northeast that are within the region's control or influence. The Governors and Premiers support and endorse the action plan's ultimate goal of virtual elimination of anthropogenic mercury releases in the region. By adequately addressing those sources within the region, we can move toward reducing mercury contamination to levels that are safe for people and wildlife, and provide an example for other regions.[1] To achieve this goal, it is essential that efforts to reduce mercury use, emissions, and discharges be initiated now. The steps outlined in this Action Plan focus on achieving such reductions over time, with a target of virtual elimination of anthropogenic mercury releases in the region through a combination of source reduction, safe waste management practices, and aggressive emissions controls. Another important goal of the Plan is the collection of additional scientific information on mercury emissions, cycling and environmental impacts, to allow for documentation and evaluation of the effectiveness of regional actions on mercury.

To monitor progress, interim goals or milestones have been established pertaining to overall mercury emissions and source reduction efforts, as well as for specific source categories. This Plan builds upon important initiatives already underway to reduce emissions of this pollutant. These include efforts to go beyond currently mandated mercury emission limits for municipal waste combustors and medical waste incinerators; to develop emission limits for other sources; to expand programs to effectively separate, collect and appropriately manage

[1] For several reasons, it will take considerable time for current successes in reducing mercury use and emissions to be translated into significant improvements in mercury levels in fish. This is due to the fact that mercury is very persistent once released and cycles through land, air, and water. Thus, the ability of the environment to "cleanse" itself of past mercury contamination is a long-term process. Additionally, there are sources of mercury, including natural and out-of-region sources, that are beyond our immediate control.

mercury-containing wastes; to pursue efforts for source reductions in products; to educate the public about mercury; and to expand and coordinate monitoring and research efforts.

The Action Plan calls for the establishment of a Mercury Task Force which will serve as the technical coordinating committee responsible for implementation of the Plan. The Task Force will report to the NEG/ECP Committee on the Environment, which is responsible for overall efforts to reduce mercury released into the environment and to minimize the public health and environmental risk associated with mercury exposure, in particular methyl-mercury (which is the most toxic form).

Basis for Action

The need for this Plan is supported by numerous studies that document elevated levels of methyl-mercury in freshwater fish across the Northeast United States and Canada. Mercury levels in freshwater fish have been monitored in the northeast U.S. region since the 1970s. The results of these monitoring programs indicate that levels of mercury significantly exceed acceptable values in fish species from certain waterbodies in the region. This information has led public health officials in the northeast U.S. to issue advisories recommending that people limit their consumption of potentially contaminated fish. Pregnant women, women of childbearing age, and children are at particular risk because the developing nervous system of fetuses and children are very sensitive to the toxic effects of mercury. Wildlife in the region may also be adversely affected, as high levels of mercury have been measured in fish eating birds, such as loons and eagles.

There are many sources of mercury in the environment. Although natural sources of mercury exist, recent research suggests that background concentrations of this metal in the atmosphere and sediments have increased by a factor of two to five since pre-industrial times. This suggests that anthropogenic sources have significantly increased mercury levels in the environment.

Much of the mercury entering the waters of the region settles from the air or is deposited in rain or other precipitation. The mercury in the air originates from many sources both within and outside of the region. In the ambient air, mercury levels are not dangerous; it is the cumulative amount of mercury deposited to waterbodies and its subsequent chemical transformation to methyl-mercury, that creates problems. Fish absorb and retain methyl-mercury, causing it to bioaccumulate until it is concentrated up to millions of times above the level in the surrounding water, particularly in older, predatory fish.

Ingestion of contaminated fish is the primary pathway of human exposure to methyl-mercury. In addition, people can be exposed to other dangerous forms of mercury at work, in school science laboratories and in their homes. Such exposures can occur following the breakage and improper cleanup of mercury containing products or as a result of children finding, spilling and playing with improperly stored or maintained elemental mercury. In addition to the tragic health effects that can be caused by such exposures, the costs of cleaning up the resulting mercury contamination can be considerable. Reduced use of mercury and better education of workers and the public about the dangers of mercury and proper handling procedures for it would help reduce the number of incidences as well as the health, environmental and economic costs of these exposures.

As noted earlier, much of the mercury entering the region's waterbodies comes from the air. Rates of mercury deposition are estimated to be higher in the northeastern U.S. relative to most other parts of the country. This situation is in part due to the existence of significant sources of mercury within the region. There is also strong evidence showing that, similar to other pollutants, airborne mercury emitted by upwind sources is transported by prevailing winds into the region. Two other factors also thought to exacerbate the mercury problem in the region include (1) the acidified condition of many waters of the region, brought on by excess acid deposition, is associated with higher levels of methyl-mercury in fish in impacted lakes; and (2) elevated summertime levels of tropospheric ozone exacerbate the conversion of elemental mercury in the atmosphere to chemical forms that are more susceptible to deposition.

Analyses suggest that a wide array of sources of mercury emissions contribute to overall deposition in the region. Municipal waste combustors are currently the largest emission source sector in the northeast states; utility and industrial boilers are the largest source sector in the remainder of the U.S., primarily from the combustion of coal; and non-ferrous metal production, (i.e. nickel, aluminum), is the major source of airborne mercury emissions in Eastern Canada.

Computer modeling conducted for the *Northeast States and Eastern Canadian Provinces Mercury Study* (NESCAUM/NEWMOA/NEIWPCC/EMAN 1998)[2] indicates that 30 percent or more of the mercury deposited in the Northeast originates from sources outside of the region. Because of the transboundary nature of mercury pollution, no single state or province will be able to solve its mercury problem alone. Concerted and coordinated regional efforts are needed. Ultimately, national and international efforts will be required to address transboundary mercury emissions, particularly from the utility sector. However, because the majority of the deposited mercury is from sources in the region, much can be done locally to address this problem. It is hoped that the aggressive commitments embodied in the regional action plan that follows will provide leadership to encourage similar actions to reduce mercury emissions nationally and internationally.

[2] Northeast States for Coordinated Air Use Management (NESCAUM), Northeast Waste Management Officials' Association (NEWMOA), New England Interstate Water Pollution Control Commission (NEIWPCC), and Canadian Ecological Monitoring and Assessment Network (EMAN).

Intergovernmental Coordination/Cooperation

Given the regional and international implications and concerns about mercury emissions and deposition, the New England states and Eastern Canadian provinces will expand collaboration with other jurisdictions and institutions, including the Great Lakes states. Specifically, the New England Secretariat of the Conference of New England Governors and Eastern Canadian Premiers will invite the participation of the governors of New Jersey and New York, and the Eastern Canadian Secretariat of the Conference of New England Governors and Eastern Canadian Premiers will monitor activities in other provinces. Because mercury has an important transboundary component, the states and provinces will also seek to work with national and international environmental agencies, such as the U.S. Environmental Protection Agency, Environment Canada, and the Commission for Environmental Cooperation. This agreement endorses an active partnership with federal counterparts from the United States and Canada to meet the challenges presented in this document.

Given the concern over high levels of mercury deposited in the region as a result of emissions from out-of-region sources, the states and provinces will coordinate with the U.S. EPA and Environment Canada in pursuing appropriate national controls for these sources. The New England state and Eastern Canadian provincial environmental agencies will seek to build alliances with their counterparts in other regions to promote and advocate for effective national controls. Similarly, the Secretariats of the Conference of New England Governors Conference and Eastern Canadian Premiers will promote and advocate such controls within the National Governors Association and the Association of Canadian Premiers.

Regional Goal: The virtual elimination of the discharge of anthropogenic mercury into the environment, which is required to ensure that serious or irreversible damage attributable to these sources is not inflicted upon human health and the environment.

Guiding Principles of the NEG/ECP Mercury Action Plan

The New England Governors and Eastern Canadian Premiers recognize the following principles as the guidelines for action on mercury in the region:

- In order to protect human health and the environment, the precautionary principle shall be used. Where there are threats of serious and irreversible damage, lack of full scientific certainty shall not be a rationale for postponing measures to prevent environmental degradation and to protect public health.

- Efforts to eliminate mercury contamination in one environmental media should not result in significant contamination of another media.

- Coordination of the efforts of the New England states and Eastern Canadian provinces is necessary for effective response strategies to address mercury issues.

- Environmental goals and objectives, in keeping with sustainable development, shall be formulated and implemented in ways that achieve high levels of ecological and human health

benefit.

- While mercury is a regional problem that requires regional solutions, out-of-region sources are also a major contributor to this environmental threat; the New England states and Eastern Canadian provinces stress the need for appropriate controls on sources outside the region. However, the need to coordinate efforts and work with other regions should not be viewed as a reason to delay action within the region.

In keeping with these guidelines, the following objectives and recommendations shall be pursued.

Action Item 1: Regional Mercury Task Force

Objective: The Secretariats of the Conference of New England Governors and Eastern Canadian Premiers will establish a regional Mercury Task Force by September 1998.

Under the direction of the NEG/ECP Committee on the Environment, the Mercury Task Force shall:

1. Coordinate and prioritize the implementation of the actions in the Mercury Action Plan, based on the availability of funding and other resources.

2. Monitor and report on the progress toward achieving the Plan's objectives.

3. Propose any necessary revisions, redefinitions, and adjustments to the objectives and recommendations of the Plan.

4. Examine proposed or enacted state and provincial mercury reduction legislation within and outside the region, develop model legislation on mercury, and coordinate the development of pertinent pollution prevention and control regulations and requirements in the states and provinces.

5. Monitor the development of federal emissions and waste regulations and/or guidelines, and provide comments and recommendations on proposed standards and regulations.

6. Coordinate, as appropriate, the regional actions of the Mercury Action Plan with other programs and efforts outside the region, and with federal initiatives.

7. Reassess the reporting protocols for the U.S. Toxics Release Inventory (TRI) and the Canadian National Pollution Release Inventory (NPRI) for mercury by the beginning of 1999, and make recommendations for any necessary revisions.

Action Item 2: Mercury Emissions Reductions

Overall Regional Objective: By the year 2003, reduce mercury emissions through the implementation of the actions herein which, if completed, are expected to achieve a reduction of at least 50%, through emissions reductions as well as source reductions and safe waste management.

Source Specific Emission Reduction Goals[3]

a. Municipal Solid Waste Combustors:

Objective: By 2003, reduce the overall amount of mercury emitted from MSW combustion sources in the region through a combination of source reduction, waste segregation and emissions controls.

Recommendations

1. Regionally, adopt a 0.028 mg/dscm (milligrams per dry standard cubic meter) mercury emission limit for facilities that have the capacity to burn 250 tons/day or more of municipal solid waste.[4]

2. Mercury emission limits for existing and new facilities under 250 tons/day will be evaluated regarding the feasibility of adopting the 0.028 mg/dscm on a case-by-case basis.

3. Perform at least annual emissions monitoring and stack testing.

b. Medical Waste Incinerators:

Objective: By 2003, reduce - to the maximum extent feasible - the overall amount of mercury emitted from medical waste incinerators in the region through a combination of source reduction, waste segregation and emissions controls.

Recommendations

4. Regionally adopt a 0.055 mg/dscm emission limit for medical waste incinerators. The region will evaluate the feasibility of adopting the 0.028 mg/dscm emission limit or lower for these facilities within three years.

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[3] It is important to note that source reduction/recycling efforts are preferable to emission controls. The potential for mercury pollution can be more effectively reduced this way. Because source reduction efforts take time to establish and are not applicable in all cases, improved emission controls will be needed to achieve substantial immediate reductions in mercury releases. It should also be recognized that complete information is not available on all sources.

[4] Most Eastern Canadian and some U.S. facilities in this category already meet or surpass this standard, therefore most of the reductions from this goal will be obtained from U.S. facilities that are not currently controlled to this level. Also, it should be noted that the 0.028 mg/dscm standard is based on EPA protocols; adjustments may need to be made to apply this figure to Eastern Canadian sources.

5. Perform at least annual emissions monitoring and stack testing.

6. Require, through facility permits or other suitable means, that all medical waste treatment facility customers have in place effective mercury source reduction and separation programs. This requirement shall be implemented on a consistent basis throughout the region. These source separation plans shall also be stipulated by contract between the facility and its customers.

c. Sludge Incinerators:

Objective: By 2003, reduce - to the maximum extent feasible - the overall amount of mercury emitted from municipal sludge incinerators in the region through a combination of source reduction, waste segregation and emissions controls.

Recommendations

7. Evaluate the feasibility of adopting a 0.1 mg/dscm emission limit or lower for municipal sludge incinerators.

8. Adopt source reduction, recycling measures, and pretreatment, to reduce mercury loading to municipal waste water.

9. Perform at least annual emissions monitoring and stack testing.

d. Utility and Non-Utility Boilers:

Objective: Utility and non-utility boilers - particularly coal-fired units[5] - are a significant overall source of mercury emissions and deposition. Because of the transboundary nature of mercury pollution from these sources, out-of-region boilers have been identified as a significant contributor to the northeast's mercury problem. In light of this, the primary objectives of this plan are the timely adoption of national reduction programs for this source category and the reduction of our own region's emissions. This goal will be achieved by promoting the application of best available measures within the northeast and adopting technologically and economically feasible control strategies or practices to reduce emissions from these sources.

[5] Mercury emissions from coal-fired boilers are estimated to account for 33% and less than 20% of the total in the U.S. and Canada respectively. In the northeast states total annual mercury emissions are estimated to be 15,903 kg, and the contribution from utility boilers amounts to 2,008 kg. In the Eastern Canadian provinces total annual mercury emissions are estimated at 2,356 kg, with emissions from utility boilers estimated to be 292 kg (based on the *Northeast States and Eastern Canadian Provinces Mercury Study*).

Recommendations

10. The NEG/ECP Committee on the Environment should promote the establishment and implementation of national and international strategies to reduce mercury emissions from utility and non-utility boilers.

11. The Mercury Task Force shall identify mercury emission control options and regional emission reduction targets for these sources within one year, using the best available information. This evaluation should include an assessment of any national actions in this area and, as necessary, pilot studies of the effectiveness and feasibility of identified emission control technologies.

12. Based on these evaluations, the respective jurisdictions will develop and implement regional strategies to promote maximum economically and technically feasible reductions in mercury emissions from utilities and other boilers in the northeast. The implementation of these efforts should commence within 5 years (by the year 2003).

e. Industrial Sources:

Objective: Maximum achievable emission reductions for individual facilities should be achieved in the shortest feasible timeframe. Specific industrial sector emission limits and control requirements will be recommended by the Mercury Task Force.

Recommendations

13. Encourage the expeditious adoption of maximum achievable standards for major industrial sources, such as chlor-alkali plants and non-ferrous metals production.

f. Area Sources:

Objective: Maximum achievable reductions in mercury emissions will be achieved for each subcategory - general lab use, dental preparation and use, paint use, crematories, and landfills - as noted in the *Northeast States and Eastern Canadian Provinces Mercury Study* within the shortest possible timeframe.

Recommendations

14. Develop targets and timelines with an emphasis on source reduction, segregation and safe waste management efforts, including recycling.

Action Item 3: Source Reduction and Safe Waste Management, including Recycling

Overall Regional Objective: Eliminate or reduce non-essential uses of mercury in household, institutional and industrial products and processes. Segregate and recycle mercury attributable to the remaining uses and or products to the maximum degree possible.

Objective #1: By 2003, reduce the overall amount of mercury-containing wastes from household, commercial and industrial sources, through source reduction, segregation and safe waste management, including recycling.

Recommendations

15. Reduce/eliminate the use of mercury in medical and consumer products to the extent feasible.

16. Identify and implement source reduction programs and develop model legislation.

17. Reduce the use of mercury and the generation of mercury-containing wastes by expanding state and provincial pollution prevention technical assistance to institutions such as dental clinics, hospitals, schools and laboratories.

18. Draft model legislation implementing coordinated labeling and manufacture take-back programs to help consumers identify products containing mercury and how to properly dispose of them, and work with the New England congressional delegation and members the Canadian Parliament from Eastern Canada to enact labeling legislation.

19. Eliminate the use of mercury in school science programs through the initiation of programs and/or legislation, and encourage the recycling and safe management of existing stocks.

20. Adopt measures to curtail the sale of elemental mercury and educate affected populations as to the risks involved with cultural uses.

Objective #2: In those instances where source reduction is not currently feasible, promote the safe management and recycling of mercury-containing wastes.

Recommendations

21. Evaluate the effectiveness of existing mercury collection and recycling efforts and develop strategies to increase the effectiveness of existing state and local efforts.

22. Develop additional recycling and reclamation programs for mercury-containing products by establishing innovative public/private partnerships with combustion facilities, businesses, institutions and municipalities.

23. Institute collection programs for elemental mercury used by dentists, water suppliers, and other identified users, and establish safe handling practices for the collected mercury.

24. Develop strategies to minimize cross-media impacts of mercury management policies by coordinating efforts and facilitating discussions among air, water, and waste programs.

25. Support regional collaboration to resolve regulatory issues and barriers associated with safe waste management and recycling of mercury containing wastes and to enhance state and provincial implementation of improved regulatory programs.

Action Item 4: Outreach and Education

Objective #1: Educate the public about the adverse health and environmental effects of mercury and ways to reduce the risk of exposure. Develop effective outreach programs for at-risk populations**.**

Recommendations

26. Develop and implement a communications strategy to contact and educate sensitive populations about the health effects of consuming mercury contaminated fish and ways to reduce their risk.

27. Develop and implement a communication strategy to address health effects of exposure to elemental mercury from incidental/accidental exposure and through ritualistic uses of mercury.

28. Develop consistent and/or compatible health advisories for States and Provinces with shared waterbodies and publicize them.

Objective #2: Educate the public and industry about products that contain mercury and recommend appropriate substitutes and other methods of reducing their use of mercury and proper recycling and waste management techniques.

Recommendations

29. Develop brochures on products containing mercury, and alternatives.

30. Develop a regional educational programs for commercial and institutional sectors that generate substantial mercury waste, and promote the use of low or no mercury products and processes and, if necessary, proper recycling and waste management.

31. Develop a regional guide to the state and provincial agency mercury contacts.

Action Item 5: Research, Analysis and Strategic Monitoring

Objective #1: Support and expand research and analysis to improve our understanding of mercury sources, impacts and cycling in the environment.

Recommendations

32. Establish a bi-national mercury research workgroup which will identify regional research priorities, interface with Canadian and U.S. national research efforts, and initiate/implement region-specific research.

33. Develop or refine mercury inventories in all states and provinces. Coordinate with federal authorities to improve emissions estimates for source categories with uncertain projections and collect more accurate and representative data to enable the development of inventories for sources that are not currently included in the mercury inventory, including refineries and mobile sources.

34. Coordinate and facilitate information exchange, in order to achieve the same level of quality among inventories and ensure uniformity with the RELMAP inputs.

35. Develop a systematic approach for quantifying the expected reductions from existing and planned emissions control strategies and updating the emission estimates for the affected sources.

36. Promote the collection of more emissions test data for sources such as utility and non-utility boilers, mobile sources, and oil refineries.

37. Coordinate with federal authorities to develop an updated inventory of the sources of mercury in municipal solid waste.

38. Promote the development of a viable mercury dispersion model for use by researchers and regulators.

39. Encourage research on green chemistries for safe alternatives.

Objective #2: Support and expand strategic monitoring of mercury emissions, deposition and fish tissue levels and develop meaningful environmental indicators to measure and track progress.

Recommendations

40. Develop a comprehensive set of regional indicators to evaluate the effectiveness of reduction strategies and measure environmental results.

41. Develop a regional long-term atmospheric transport monitoring network that would measure mercury, acid rain, and fine particulate matter at each site.

42. Integrate the existing and forthcoming New England and Eastern Canadian regional mercury deposition networks and maintain these networks for at least five years. Adjust network components as necessary.

43. Develop standard protocols for fish and wildlife tissue sampling and analysis to ensure consistent and comparable data. Conduct additional fish tissue monitoring as necessary, and develop a comprehensive database for the Eastern Canadian provinces and New England states.

Action Item 6: Mercury Stockpile Management

Objective: Minimize mercury stockpile entry into commercial marketplace to reduce future emissions.

Recommendations

44. Under the auspices of the NEG/ECP, advocate for the safe management of U.S. Department of Defense mercury stockpiles.

45. Seek to identify any other mercury stockpiles, both public and private, and ensure their safe management.