ACTION PLANS FOR PBT POLLUTANTS

INTRODUCTION

To illustrate EPA's approach to PBT pollutants under the PBT Strategy, the draft Mercury Action Plan is attached. This action plan focuses on regulatory and voluntary actions, enforcement and compliance, research, and outreach to characterize and reduce risks associated with mercury. It involves multimedia and cross-office actions, quantitative challenge goals, stakeholder engagement, international coordination, and long-term emphasis on pollution prevention. In these ways, the draft Mercury Action Plan is representative of the overall Agency approach to PBT pollutants. Nonetheless, mercury is different from other PBT pollutants in terms of the maturity of EPA's knowledge base and program actions. Action plans for banned substances like canceled pesticides or PCBs, or for substances with less well characterized risk like octachlorostyrene, may differ significantly in substance and format from the action plan for mercury. Also, as the Agency moves forward in developing action plans for more PBT pollutants, opportunities will begin to appear for addressing multiple PBTs at a time, through orchestrated use of available multi-media, sector-based, and place-based approaches.

Table 1 summarizes the actions within the draft Mercury Action Plan.

Table 1. Significant Actions Underway to Identify and Reduce Risks from Mercury

Lead EPA Office	Action	Milestone
OAR, OECA	Implement Municipal Waste Combustion (MWC) And Medical Waste Incinerator (MWI) Regulations	New MWC and MWI units must comply at start up. Existing MWC units must comply by December 2000, existing MWI units by September 2002.
OSW	Promulgate Hazardous Waste Combustion Facilities Regulations	Final hazardous waste combustion facilities (incinerators, cement kilns, and lightweight aggregate kilns) regulations by February 1999
OAR, OPPTS	Develop Recommendations to Limit Emissions from Additional Source Categories	Proposed Industrial Combustion Coordinated Rulemaking – end of 2000
OAR	Require coal fired plants to submit information pertaining to the quantity and species of mercury emissions.	Public comment period on proposal notice in Federal Register closes October 22, 1998
OAR	Issue standard for mercury cell chlorine production	Proposed rule by November 1999
OAR, ORD, OW, OECA	Provide States and Tribes with Tools for Developing and Implementing Enforceable Total Maximum Daily Loads (TMDL) for Mercury	• Complete the pilot TMDL for mercury by end of CY 1999 • Complete studies on identifying sources by tracing emissions by end of CY 2000 • Initiate the "National Survey of Chemical Residues in Fish" in FY 1999
OW	Revise Mercury Water Criterion	Draft human health criteria methodology by the end of CY 1999; final criterion for methyl mercury by end of CY 2000.
OPPTS, Regions 1 and 5	Pursue Voluntary Reductions in Industrial Use and Releases	Ongoing Region 1 is piloting a recognition program for hospitals that reduce mercury emissions
OPPTS	Reduce TRI Reporting Threshold for Mercury	• Proposed Rule – end of 1998 • Final Rule – end of 1999
OSW	Develop Disposal Options for Hazardous Wastes Containing Mercury	Advance Notice of Proposed Rulemaking (ANPRM) in 1999
OIA, OPPTS, ORD, Regions 1, 5, 10	Give High Priority to Mercury in International Efforts	Representation and Leadership for Heavy Metals (including mercury) at AMAP Expert and Working Group meeting, Anchorage, AK, April 20-24, 1998; Representation and Leadership at Arctic Council Meeting, London, UK August 1998 Representing Region 1 in the NEG/ECP Mercury Action Plan
ORD	Develop a Mercury Research/Monitoring Strategy and Implement an EPA Mercury Research/Monitoring Plan	Draft Mercury Research Strategy – October 30, 1998

Lead EPA Office	Action	Milestone
Region 9, OW	Develop Options for Addressing Abandoned Mines Mercury Problem	ANPRM in 1998
Regions, OAR, OSW, OW, OECA	Support Regional, State and Local Actions to Reduce Mercury	Ongoing

EPA Action Plan for Mercury

INTRODUCTION

Mercury has long been known to have toxic effects on humans and wildlife. For centuries, mercury miners have had their work time-limited. In the nineteenth century, observation of toxicity in hatmakers using mercury brought the phrase "mad as hatters" into our lexicon. Mercury is a toxic, persistent, bioaccumulative pollutant that affects the nervous system. Methylmercury is the chemical species that bioaccumulates in fish. People who consume large amounts of fish are at risk of adverse effects of methylmercury on the nervous system. Because the developing nervous system is more vulnerable to mercury toxicity, children exposed to methylmercury through their mother's consumption of fish and individuals who eat large amounts of fish from local waters because of economic or cultural reasons are particularly at risk of adverse effects. Mercury is the most frequent basis for fish advisories, represented in 60 percent of all water bodies with advisories. Forty-one states have advisories for mercury in one or more water bodies, and eleven states have issued statewide mercury advisories.

Every Environmental Protection Agency (EPA) program, both regulatory and voluntary, is concerned with some aspect of exposure to mercury. Under these programs, the Agency has taken many actions to reduce human and environmental exposure to mercury, but there is still more work to be done. Both the 1995 and 1997 *Great Waters Reports to Congress* highlighted the risks of mercury in the Great Lakes, Chesapeake Bay, the Gulf of Mexico, Lake Champlain, and our coastal waters. In April 1997, President Clinton issued an Executive Order requiring each federal agency to assess risks that disproportionately affect children, including risks from mercury. On April 7, 1997, the United States and Canada signed the Binational Toxics Strategy, developed under the Great Lakes Water Quality Agreement. The Binational Toxics Strategy sets a challenge of 50 percent reduction by 2006 in the deliberate use of mercury nationwide and in the aggregate of releases to the air nationwide and to the water within the Great Lakes Basin.

Most recently, on February 19, 1998, President Clinton and Vice President Gore released the *Clean Water Action Plan*, which provides a blueprint for restoring and protecting the nation's water resources. The *Clean Water Action Plan* includes many key actions to ensure that the nation's waters support healthy people, including specific actions to address mercury and other contaminants. In the *Clean Water Action Plan*, EPA commits to developing in 1998, a multimedia strategy addressing mercury and other persistent, bioaccumulative and toxic pollutants that cannot be fully addressed through single media controls and approaches.

As required by the Clean Air Act (CAA) Amendments of 1990, in December 1997 EPA issued the *Mercury Study Report to Congress*. The extensively peer-reviewed *Mercury Study Report to Congress* inventories the quantity of mercury emissions to the air from a number of sources related to human activity; assess mercury transport and environmental exposure to wildlife and human populations; estimates the health and environmental impacts associated with this exposure; and describes the technologies (and associated costs) available to control these mercury emissions. Recent and planned EPA actions will greatly reduce releases of mercury to the environment and mercury exposures. Building on this foundation, more remains to be done.

The recommendations in *EPA's Action Plan for Mercury* are an example of how the Agency can work cooperatively across media programs to address persistent, bioaccumulative, toxic pollutants that move from land, to air, water and sediment.

OVERVIEW OF THE MERCURY PROBLEM

As it moves through environmental media, mercury undergoes a series of complex chemical and physical transformations. These scientific issues were addressed in the *Mercury Study Report to Congress*:

> *Mercury cycles in the environment as a result of natural and human (anthropogenic) activities. The amount of mercury mobilized and released into the biosphere has increased since the beginning of the industrial age. Most of the mercury in the atmosphere is elemental mercury vapor, which circulates in the atmosphere for up to a year, and hence can be widely dispersed and transported thousands of miles from likely sources of emission. Most of the mercury in water, soil, sediments, or plants and animals is in the form of inorganic mercury salts and organic forms of mercury (e.g. methylmercury). The inorganic form of mercury, when either bound to airborne particles or in a gaseous form, is readily removed from the atmosphere by precipitation and is also dry deposited. As it cycles between the atmosphere, land, and water, mercury undergoes a series of complex chemical and physical transformations, many of which are not completely understood.*
>
> *Mercury accumulates most efficiently in the aquatic food web. Predatory organisms at the top of the food web generally have higher mercury concentrations. Nearly all of the mercury that accumulates in fish tissue is methylmercury.*
>
> *Fish consumption dominates the pathway for human and wildlife exposure to methylmercury. The Mercury Study Report to Congress supports a plausible link between anthropogenic releases of mercury from industrial and combustion sources in the United States and methylmercury in fish. However, these fish methylmercury concentrations also result from existing background concentrations of mercury (which may consist of mercury from natural sources, as well as mercury which has been re-emitted from the oceans or soils) and deposition from the global reservoir (which includes mercury emitted by other countries). Given the current scientific understanding of the environmental fate and transport of this element, it is not possible to quantify how much of the methylmercury in fish consumed by the U.S. population is contributed by U.S. emissions relative to other sources of mercury (such as natural sources and re-emissions from the global pool).*
>
> *The typical U.S. consumer eating fish from restaurants and grocery stores is not in danger of consuming harmful levels of methylmercury from fish and is not advised to limit fish consumption. The levels of methylmercury found in the most frequently*

consumed commercial fish are low, especially compared to levels that might be found in some non-commercial fish from fresh water bodies that have been affected by mercury pollution. While most U.S. consumers need not be concerned about their exposure to methylmercury, some exposures may be of concern. Those who regularly and frequently consume large amounts of fish -- either marine species that typically have much higher levels of methylmercury than the rest of seafood, or freshwater fish that have been affected by mercury pollution -- are more highly exposed. Because the developing fetus may be the most sensitive to the effects from methylmercury, women of child-bearing age are regarded as the population of greatest interest.

Cost-effective opportunities to deal with mercury during the product life-cycle, rather than just at the point of disposal, need to be pursued. A balanced strategy which integrates end-of-pipe control technologies with material substitution and separation, design-for-environment, and fundamental process change approaches is needed. In addition, international efforts to reduce mercury emissions as well as greenhouse gases will play an important role in reducing inputs to the global reservoir of mercury.

STRATEGIC APPROACH

A successful action plan for identifying and reducing risks from exposure to mercury requires a new multimedia approach. As first step, EPA has analyzed current regulations, initiatives, and programs which manage and control mercury, and has identified a set of cost-effective options to move toward achieving further reductions. The cross-agency work group that developed this Action Plan is continuing to look for opportunities to address mercury through a more integrated multimedia approach The Agency proposes to take the following actions, in consultation with other federal agencies, and with the involvement of states, tribes and other stakeholders:

- **Control emissions from air point sources.** EPA has taken several important steps to reduce the levels of mercury and other pollutants, including reducing emissions from municipal waste combustors and medical waste incinerators. These actions, once fully implemented, will reduce mercury emissions caused by human activities by 50 percent from 1990 levels. Several other regulations that will limit mercury emission are under development, as well. Actions to reduce emissions of carbon dioxide to control climate change will also have a significant co-benefit in reduced mercury emissions. Additional work is being done in EPA's Total Maximum Daily Load (TDML) program to evaluate the linkage of air emissions to water quality impacts, to help determine appropriate geographically targeted reduction actions. In addition, EPA intends to gather high quality emissions data on coal-fired electric generating plants to address current uncertainties about mercury emissions and support a regulatory action.

- **Revise water quality criteria, and improve measurement of mercury in water.** EPA will revise its water quality human health criterion for mercury and publish new analytical methods for measuring mercury levels in water.

- **Seek reductions in uses of mercury and improve information and citizens' right to know.** These use-reduction measures will reduce the levels of mercury in waste streams as well as the danger of accidental releases. Generally, EPA will look to voluntary rather than regulatory approaches to reduce mercury use. Additionally, EPA is considering changing the reporting requirements for mercury under the Toxic Release Inventory (TRI), which could result in additional reporting of mercury releases.

- **Develop an environmentally acceptable disposal method for mercury wastes designated as hazardous wastes.** Currently, EPA requires that hazardous wastes containing high levels of mercury be treated to recover the elemental mercury from the waste. This requirement may no longer be the preferred approach in all cases since the demand for mercury has been reduced to the point where the supply of recovered mercury exceeds it. Also, there are some air emissions of mercury associated with the recovery process. Therefore, EPA is evaluating alternative treatment technologies which would permanently stabilize mercury wastes to allow their disposal in hazardous waste landfills.

- **Seek reduction in exposure to highly exposed populations.** Because of the long time before reductions in releases will be reflected in lower fish-tissue levels, EPA will continue public information and outreach programs, including continued support and strengthening of the states' and tribes' fish advisory programs.

- **Decrease further environmental contamination from illegal use/disposal of mercury through focused compliance monitoring and enforcement of mercury restrictions and requirements.** Focus compliance assistance and outreach, monitoring and/or enforcement on sectors/sources that are significant contributors of mercury loadings to the environment. Where enforcement actions are warranted, use Supplemental Environmental Projects (SEPs) to encourage pollution prevention activities or mitigate damage. Expand compliance and enforcement activities for direct and indirect dischargers of mercury to surface waters.

- **Continue international efforts to reduce mercury releases.** The global circulation of mercury requires concerted efforts by all countries to solve the mercury problem in any one country.

- **Perform and support further research on all aspects of the mercury problem.** A research strategy is being developed that will permit targeting of federal and other research on the most important data gaps.

- **Support regional, state, tribal and local actions to reduce mercury.** State, Tribal and local governments play a key role in achieving mercury reductions. EPA will support

state and local efforts through funding, information sharing, and coordination. For example, EPA will expand outreach to publicly-owned treatment works about preventing mercury pollution in sewage discharges.

KEY MERCURY ACTION ITEMS

The list below provides more detail about the most significant actions that EPA is undertaking to deal with the problem of mercury exposure. It is not an exhaustive list, and many other EPA activities related to mercury will continue. For further information on these or other mercury activities, please contact the offices involved.

1. Air Regulations

Municipal Waste Combustion Regulation

The Clean Air Act requires EPA to establish stringent emission limits for new and existing municipal waste combustion (MWC) units and medical waste incinerators (MWI). The limits are to be based on "maximum achievable control technology" (MACT) and must address a range of pollutants including organic emissions (such as dioxin and furans), acid gases emissions (such as SO_2, HCl, and NO_x), and metal emissions (including cadmium, lead, and mercury).

EPA established the emission limits for MWCs in December 1995. New MWC units must comply at start-up and existing MWC units must comply by December 2000. The control system used at MWCs is acid gas/PM scrubbing to reduce organic emissions, acid gas emissions, and metals emissions, other than mercury. To control mercury, the scrubbing system is supplemented with activated carbon injection. A number of acid gas/PM scrubbing systems with carbon injection have been installed and other retrofits are underway. Available data indicates the control systems achieve over 90% mercury control. At the same time, battery manufacturers are reducing the mercury content of batteries which will also reduce the mercury emissions. Based on available data, overall mercury emissions from MWCs were estimated to be 54 tons per year (tpy) in 1990, were reduced to 29 tpy in 1995, and will be less than 5 tpy when all retrofits are completed.

Office : Office of Air and Radiation, Office of Enforcement and Compliance Assurance

Milestones: New MWC units must comply at start-up and existing MWC units must comply by December 2000.

Medical Waste Incinerators Regulations

EPA set emission limits for MWIs in September 1997. New MWI units must comply at start-up and existing MWI units must comply by September 2002. The most common control system used at MWIs is a wet scrubbing system that reduces organic emissions, acid gas emissions, and metals emissions, including mercury. Where MWI's are controlled with dry scrubbing systems, activated carbon must be injected for mercury control. Based on available data, overall mercury emissions from MWIs were estimated to be 50 tpy in 1990, were reduced to 16 tpy in 1995 (primarily as a result of state regulations), and will be less than 1 tpy when the MWI regulations are fully implemented.

Office: Office of Air and Radiation, Office of Enforcement and Compliance Assurance

Milestones: New MWI units must comply at start up and existing MWI units must comply by September 2002.

Promulgate Hazardous Waste Combustion Facilities Regulations

Section 112 of the Clean Air Act requires the Agency to promulgate regulations for the control of hazardous air pollutants emissions from specified source categories, including several types of combustion units that burn hazardous waste. In April 1996, EPA proposed emission standards for incinerators, cement kilns, and light weight aggregate kilns that burn hazardous waste. This proposal, which the Agency anticipates finalizing in December, 1998, requires the sources to control mercury emissions, as well as other hazardous air pollutants. Since the proposal, the Agency has received extensive public comment, including new emissions data and comments on the methodology used to estimate mercury emissions from these facilities.

As required by the Clean Air Act, the final mercury standard will embody the maximum degree of reduction in emissions taking into consideration, as appropriate, the cost of achieving the emissions reduction. This strict, protective mercury standard will be based on mercury feedrate control (in the hazardous waste) and possibly also on other air pollution control technologies. The final rule is expected to achieve a substantial overall reduction in mercury emissions from these hazardous waste combustion facilities.

Office: Office of Solid Waste, Office of Enforcement and Compliance Assurance

Milestones: Final hazardous waste combustion facilities (incinerators, cement kilns, and lightweight aggregate kilns) regulations will be promulgated by February 1999.

Develop Recommendations to Limit Emissions from Additional Source Categories

Based in part on the recommendations of a Federal Advisory Committee, EPA is developing regulations to limit emissions of hazardous air pollutants, including mercury, and criteria pollutants for the following five source categories: industrial, commercial, and institutional boilers; process heaters; industrial, commercial, and other non-hazardous solid waste combustors (excluding municipal waste combustors and medical waste incinerators); gas turbines; and stationary internal combustion engines.

Office: Office of Air and Radiation

Milestones: Proposed regulations by end of 2000

Mercury Emissions from Power Plants

Emissions from coal-fired electric power plants represent the largest source category of mercury emissions to the atmosphere. EPA has just completed a report to Congress that examines technologies and strategies to control mercury emissions from this source. While there are currently no cost effective control technologies for mercury that are commercially available for utility boilers, some may become available in a few years. With implementation of the new National Ambient Air Quality Standards for fine particulate matter and ozone, and the second phase of the acid rain program, EPA expects to see a reduction of mercury emissions from utility boilers. Actions that power plants may take to reduce their emissions of the greenhouse gases that are responsible for climate change could also reduce mercury emissions from utilities. These reductions will occur largely as powerplants switch to cleaner fuels and use fuels more efficiently.

EPA intends to gather high quality emissions data about coal-fired electric generating plants to address current uncertainties about mercury emissions and support a regulatory action. To accomplish this, the Agency is requesting comments on a proposal to require all coal-fired power plants above 25 MW to provide the results of analysis to determine the mercury content of the coal they are burning. In addition a sample of plants would be required to perform stack testing for quantity and species of mercury emissions. The information obtained from this effort will allow EPA to calculate the amount and species of mercury emitted by each coal fired plant above 25 MW. This information will be available to the public.

Office: Office of Air and Radiation

Milestones: Public comment period on notice closes on October 22, 1998

After OMB approval, EPA will send out letters requiring emissions information in the fall of 1998.

Promulgate Emissions Standard for Chlorine Production Facilities

EPA is developing a rule that would limit mercury emissions from plants that produce chlorine using the mercury cell method. The rule will include emissions limits based on control technology and on management practices.

Office: Office of air and Radiation

Milestones: Proposed standard- November, 1999
Final standard - November, 2000.

2. Linking Air Emissions to Water Quality Impacts to Prioritize Control Actions

EPA will combine tools in the Clean Air Act and Clean Water Act to foster an air deposition/water quality management approach with state and local partners, including providing states and tribes with tools for developing and implementing total maximum daily loads (TMDL) for mercury from air deposition. EPA is also working on improving methods to identify sources by developing ways to trace pollutants back to sources, distinguishing between anthropogenic and natural sources, and attributing atmospheric loads to particular sources.

The goal of the TMDL pilot project is to demonstrate how to develop a TMDL for a waterbody that receives mercury from air deposition. The project will evaluate how to access and use existing air and water data to develop the TMDL, as well as how existing air and water modeling methods can be used. The project will also examine linkages between the Clean Air Act and Clean Water Act, and specifically, what state, local, tribal, or federal regulatory authorities that can be used to modify source air emissions to meet needed loading reduction goals.

To evaluate progress and emerging problems, EPA needs an updated information base on levels of mercury and other persistent, bioaccumulative toxics in fish. EPA will conduct a "National Study of Chemical Residues in Fish". This survey will evaluate the incidence and severity of mercury and other persistent, bioaccumulative toxicants in fish downstream of suspected problem areas and in background areas. EPA will work in partnership with state and tribal Departments of Health and Environmental Protection to carry out the study.

Office: Office of Air and Radiation, Office of Research and Development, Office of Water, Office of Enforcement and Compliance Assurance

Milestones: Complete the TMDL for mercury by end of 1999
Complete studies on identifying sources by tracing emissions by end of 2000
Initiate the "National Survey of Chemical Residues in Fish" in FY 1999.

3. Revision of Mercury Water Quality Criterion

Under the Clean Water Act, EPA establishes water quality criteria, that are used by states and tribes to establish enforceable water quality standards. Water quality standards may reflect a variety of site-specific considerations. Water quality standards are reflected in permits for dischargers to surface waters and in a variety of other regulatory actions.

The current national water quality criterion for mercury uses a method for estimating fish-tissue levels, the bioconcentration factor (BCF), which does not include biomagnification in the food chain. EPA subsequently published a water quality criterion for mercury in the Great Lakes basin which is based on use of a bioaccumulation factor (BAF), which does include biomagnification in the food chain.

The Office of Water (OW) is accelerating development of a revised water quality human health criterion for mercury, which will reflect two major elements:

- A revised Human Health Methodology -- this provides for use of BAFs rather than BCFs, and improved means for estimation of fish consumption;

- An updated human health risk assessment.

The combined effect of these changes will be to make the criterion more reflective of sound science and current risk assessment practice. The preferred approach to the revised criterion will be a methylmercury fish level to be used with measured fish tissue methylmercury levels. States and tribes which elect to depart from the preferred approach will be referred to defaults which will include mercury and methylmercury water levels. These water levels are likely to be more stringent than the current criterion. The direct effect of a more stringent water quality criterion may be to include new or more stringent discharge limits for direct dischargers to surface water (both industries and municipalities). Currently, direct water discharges are believed to be small compared to input from air deposition. Nonetheless, limits on direct discharges may be an important part of achieving mercury reduction goals. In parallel with the revision of the water quality criterion, OW will be revising its required analytical method to be more sensitive (below the new criterion level) and less subject to sample contamination. Together, these changes will lead to a more precise measure of mercury levels in water discharges and to more effective water quality-based effluent limits when the discharges are contributing to exceedances of water quality standards. EPA expects that permittees will most likely first consider pollution prevention to find and control sources of mercury into the wastewater, rather than end-of-pipe treatment to meet limits.

Indirectly, but no less importantly, revision of the water quality criterion will contribute to EPA's efforts to integrate assessment of watersheds and airsheds in order to target air pollution control and other activities to reduce mercury levels in water and ultimately, in fish and the humans and animals that eat fish.

With the release of the Mercury Study Report to Congress, the Agency committed to participate in an interagency review of recent human data on methylmercury. This review will

concentrate on levels of exposure to mercury associated with subtle neurological endpoints and is aimed at achieving consensus among Federal agencies on estimates of human risk. A workshop is scheduled for November 1998. In addition, Congress has required an 18-month National Academy of Sciences study and recommendation on the reference dose for methyl mercury.

Office: Office of Water

Milestones: Draft human health criteria methodology by the end of calendar 1999.

Peer review of application of new methodology to methyl mercury completed by mid-2000.

Final development of mercury criterion in 1999.

4. Pursue Voluntary Reductions in Industrial Use and Releases

Mercury consumption in the United States is attributable primarily to a few categories of products and processes, including the manufacture of chlorine and caustic soda, wiring devices and switches, measuring and control instruments, dental amalgam and laboratories. EPA is pursuing a number of voluntary reduction initiatives in these industrial uses and releases of mercury. Ongoing and planned mercury reduction actions include:

- collaboration with the chlor-alkali industry to achieve a 50 percent reduction in mercury use and releases by this sector by 2005, a commitment made by this industry through its representative, the Chlorine Institute. In addition, EPA will work with the industry to develop improved estimates of releases from this sector;

- outreach to hospitals, including Veterans Administration hospitals and other public and private hospitals to encourage them to discontinue purchases of mercury-containing devices and products and to properly dispose of existing mercury. In addition, EPA will explore opportunities to work with the American Hospital Association, other medical facilities, dentists, and veterinary clinics on reducing use and release of mercury;

- outreach to manufacturers and users of mercury switches and relays on mercury-free alternatives;

- outreach to the utility industry to encourage implementation of voluntary efforts to control mercury release, including elimination of the use of mercury-containing equipment, and exploration of potentially cost-effective options such as fuel-switching and optimization for mercury reduction of controls whose primary purpose is reducing emissions of other pollutants; and

- collaboration with laboratories on reduction of mercury use. As part of this effort, EPA will work with other standard-setting bodies to address mercury pollution prevention opportunities through revisions to approved analytical methods and directions for laboratory use, handling and recycling or proper disposal of mercury.

Office: Office of Prevention, Pesticides, and Toxic Substances, Regions 1 and 5

5. Reduce Reporting Threshold for Mercury Under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA).

Mercury and mercury compounds are currently listed under section 313 of EPCRA and reports are received from facilities that manufacture, process, use, release into the environment, or otherwise manage as waste mercury and mercury compounds. These reports are made available to the public through the Toxics Release Inventory (TRI). However, to date the reports have come from a fairly small number of large sources, such as chlor-alkali plants. In 1997, the categories of industrial facilities required to report under EPCRA section 313 were expanded to cover, among others, electric utilities, and hazardous waste treatment, storage and disposal (TSD) facilities. Combustion of fossil fuels for energy has been identified as a major source of mercury. Therefore, the facilities expansion could result in significant increases in reporting of mercury under EPCRA section 313.

It is likely that, to date, few reports on mercury releases have been received under EPCRA section 313 because reporting thresholds have been too high to capture mercury releases from many covered facilities. In order to ensure that reporting on mercury under EPCRA section 313 will be fully effective, especially taking into account releases from industrial facilities newly subject to EPCRA section 313, EPA is considering reducing the reporting threshold for mercury. EPA can reduce reporting thresholds from the levels set out under EPCRA section 313 as long as the new threshold "shall obtain reporting on a substantial majority of total releases of the chemical at all facilities subject to the requirement of this section." EPA is currently reviewing data on mercury in light of the criteria established in the statute for revision of the TRI reporting threshold.

EPA expects to propose a rule lowering the reporting thresholds for chemicals that persist and bioaccumulate (including mercury and mercury compounds) by the end of 1998. A final rule is expected by the end of 1999. Reporting under the final rule would be expected to begin in 2000, with the first reports covered by the new rule released in 2001.

Office: Office of Prevention, Pesticides, and Toxic Substances

Milestones: Proposed Rule - end of 1998
Final Rule - end of 1999

6. Develop Disposal Options for Hazardous Wastes Containing Mercury

Current waste treatment standards for many hazardous wastes containing mercury are based on recovery of mercury through retorting. EPA is planning to evaluate other options because 1) the supply of recycled mercury is increasing while the demand is decreasing and 2) there are concerns over potential emissions from retorting. In addition, for organic hazardous wastes which contain mercury, the current treatment standards are often based on incineration, which also raises concerns over air emissions.

Therefore, EPA is considering an Advance Notice of Proposed Rulemaking (ANPRM) to revise its hazardous waste treatment standards to include alternatives based on permanent stabilization of mercury. These alternatives could also apply to elemental mercury. The Agency hopes to issue this ANPRM in 1999.

Office: Office of Solid Waste

Milestones: ANPRM in 1999

7. Give High Priority to Mercury in International Efforts

Mercury's ability to be cycled globally poses both a challenge and an opportunity to the U.S. As long as mercury is produced, used and released into the environment in other countries, the U.S. will be on the receiving end of some mercury, thus reducing the overall impact of our domestic mercury control measures. Yet, this problem represents a real opportunity for the U.S. to demonstrate leadership internationally on mercury risk characterization and risk reduction.

EPA is participating in bilateral and international fora to encourage the cooperative development and use of relevant scientific and technical information about mercury. These fora include the U.S.-Canada Great Lakes Binational Toxics Strategy, the North American Commission for Environmental Cooperation (CEC) and its Sound Management of Chemicals Initiative, the U.N. Economic Commission for Europe's Convention on Long-Range Transboundary Air Pollution (LRTAP) and its legally-binding protocol on mercury and other heavy metals, the Organization for Economic Cooperation and Development (OECD) and its programs on heavy metals risk management and the elimination of environmentally adverse economic subsidies, the Arctic Monitoring and Assessment Program (AMAP), and the New England Governors/Eastern Canadian Premiers (NEG/ECP) Mercury Action Plan.

On April 7, 1997, the United States and Canada signed the Great Lakes Binational Toxics Strategy. The 50% emissions reduction goal of the binational strategy is detailed on page 2 of this action plan. At the present time the EPA and Environment Canada are working with all industrial sectors that release mercury, States, Tribes, environmental groups and the public, to help identify and undertake specific mercury reduction activities.

Under the CEC Resolution #95-5 mercury was identified as one of the first four chemicals selected for the Sound Management of Chemicals Initiative. A North American Regional Action Plan (NARAP) on mercury has been developed that establishes a number of cooperative initiatives among Mexico, Canada, and the United States to improve the scientific understanding of the mass balance of mercury in North America, to promote pollution prevention actions across the continent, and to assist Mexico in capacity building. By June of 1999, phase II of the NARAP will be completed. It will establish specific action-oriented commitments for activities addressing mercury use and reductions.

In February 1998 the U.S. and other Parties to the U.N. Economic Commission for Europe's Convention on Long-Range Transboundary Air Pollution (LRTAP) concluded negotiations on a legally-binding protocol on mercury and other heavy metals. The protocol includes obligations to control mercury emissions from stationary sources and to establish and report mercury emissions inventories. It also contains obligatory and voluntary provisions regarding the use of mercury in products. The U.S. can take a number of steps to encourage other ECE countries to comply with the protocol.

Through the Arctic Monitoring and Assessment Program and other international initiatives, the U.S. is collaborating with other countries to better characterize and understand the international or transboundary nature of mercury sources, transport, deposition and fate. In addition, the U.S. will continue to encourage other countries to undertake domestic mercury risk reduction measures, with a focus on pollution prevention approaches. This could involve working bilaterally on a government-to-government basis and multilaterally through the OECD, the LRTAP Convention or other international fora.

On June 8, 1998 The New England Governors/Eastern Canadian Premiers signed a resolution concerning mercury and its impacts on the environment. In addition, the Governors and Premiers adopted the Mercury Action Plan which has as its regional goal "The virtual elimination of the discharge of anthropogenic mercury into the environment." The NEG/ECP has established a task force, which includes the New England states, the Eastern Canadian Provinces, to coordinate and implement the Mercury Action Plan. The action plan identifies 45 specific actions to reduce mercury emissions. Including emission reduction targets from specific source categories, such as municipal waste combustors, medical waste incinerators, sludge incinerators, utility and non-utility boilers, industrial and area sources and source reduction and safe waste management of mercury.

Office: Office of International Activities, Office of Prevention, Pesticides, and Toxic Substances, Office of Research and Development, Regions 1, 5, and 10

Milestones: Representation for Heavy Metals (including mercury) at AMAP Expert and Working Group Meeting , Anchorage AK, April 20-24, 1998

Representation For Mercury at the Arctic Council Senior Officials meeting, London, UK, August 1998

Signing of LRTAP Heavy Metals Protocol, Denmark, June 1998

Development and implementation of cooperative mercury monitoring programs with other Arctic countries

By June of 1999, phase II of the CEC NARAP will be completed.

The Mercury Task force will report back to the NEG/ECP Committee of the Environment in June 1999.

8. Develop a Mercury Research/Monitoring Strategy and Implement an EPA Mercury Research/Monitoring Plan

The Office of Research and Development (ORD), in cooperation with scientists from EPA program offices and regions, will develop a mercury research/monitoring strategy to facilitate coordination and communication on mercury-related research plans and projects among organizations in the public and private sectors, including other Federal agencies, state governments, academia and industry. This brief strategy document will be developed using as its basis the risk-based framework in the Mercury Study Report to Congress and will include the following summary information:

(1) description of research needed to better assess potential health and ecological risks, to more completely document exposures, and to better manage such risks, and

(2) description of ongoing EPA research activities, including various modeling and monitoring studies, e.g., in South Florida and in the Great Lakes region and participation in international fora, e.g, the North American Task Force on Mercury (pursuant to the North American Commission on Environmental Cooperation established under NAFTA).

The strategy will identify the scientific and technical information needs and priorities for research in the relevant areas. Some of the research areas that may be addressed are: emission characterization, atmospheric transport and fate, deposition, fate in terrestrial and aquatic media, bioaccumulation, ecological toxicity, health effects, exposure, monitoring, risk communication, and risk management-related prevention, control, and remediation of mercury and mercury compounds. ORD initiated the strategy development effort in January 1998 and will make available a draft that is ready for peer review by October 30, 1998.

Based on the mercury research/monitoring strategy, ORD and other EPA offices, in cooperation with the greater scientific community, will develop and implement an EPA research/monitoring plan. The plan will build on ongoing research efforts in the areas of mercury fate and transport modeling and monitoring, assessment methods development for health and ecological impacts, risk communication, and advances in pollution prevention and

other risk management technologies and approaches. The plan will include consideration of the following research areas:

- the development and evaluation of emission control technology for coal-fired utilities and other mercury emitters in support of the Office of Air and Radiation (OAR) and the Office of Solid Waste and Emergency Response (OSWER) programs. This effort will include attention to speciation issues, control option costs and the ultimate disposal of the mercury-containing wastes resulting from the control options.

- the development of fate, transport and transformation data in support of Office of Water (OW) determinations of total maximum daily loads (TMDLs) for mercury.

- the provision of deposition monitoring technology to determine the effectiveness of control options.

- the virtual elimination of the use of mercury in products and improved management of mercury wastes in support of the Office of Prevention, Pesticides, and Toxic Substances (OPPTS), OSWER, and the Regions.

- the refinement and improvement of health and environmental risk assessments for mercury that reflect evaluation of recent studies of health and environmental effects of mercury exposure, with particular attention to sensitive sub-populations, e.g., the developing fetus and children, to support risk-based decision-making.

Work under this plan will include research conducted in-house by ORD, as well as a component of extramural research supported through ORD's Science To Achieve Results (STAR) grants program.

Office: Office of Research and Development

Milestones: Draft mercury research strategy - October 30, 1998

9. Develop Options For Addressing Abandoned Mines Mercury Problem

Mercury at abandoned mine sites is a problem faced by many western States. The mercury at the abandoned mine sites is either from abandoned mercury mines (No active mercury mining occurs in the United States), or from gold and silver mining sites, where mercury was either used as an amalgamation agent in historic large scale placer mining and traditional hard rock mining operations, or from recent small scale "recreational" placer mining operations, which continue to flourish in the western states.

To address the potential for mercury contamination of watersheds that drain these abandoned mine sites, EPA will support efforts to fully research the extent and nature of this problem, including efforts to characterize and map the sites, and study watershed impacts downstream. EPA will also support efforts to locate responsible parties where feasible. EPA will also assist in the cleanup and remediation of sites, undertaken by "Good Samaritans" as defined by the law in different States. EPA will consider whether it would be appropriate for certain abandoned sites to be issued NPDES permits, or general storm water permits, where such permits are not currently required or have not been issued.

Disposal options will also need to be developed for the disposal of mercury contaminated mining wastes. Currently the common options are to cover the site soils with clean soil, paving, or some other material, or to excavate and transport the contaminated soil to an offsite landfill. Another alternative for small and large sites that should be considered is permanent stabilization of mercury. This has been proposed for an ANPRM in 1998, and the ANPRM could be required to address the potential use of permanent stabilization as a disposal method for mine wastes, including a study of its scientific feasibility and costs. Another alternative to control mercury disposal at small "recreational" placer mining sites, may be to provide specially marked and designed disposal containers for use in small scale placer mining, and education on how and why these containers should be used. Methods to safely dispose these containers must also be developed and implemented.

Office: Region 9, Office of Water

Milestones: ANPRM in 1998

10. Support Regional, State and Local Actions to Reduce Mercury

State and local governments are vital to the achievement of mercury reductions. They have a central role to play in outreach to the business community and to the general public about the importance of properly disposing of mercury-containing products and the alternatives to such products. In addition to this important pollution prevention role, State and local governments have developed innovative mercury reduction laws and regulations that supplement, and in some cases provide a model for, national efforts. EPA supports State and local efforts through funding of mercury reduction projects, provision of information about mercury sources and reduction opportunities, and coordination of joint efforts. This support will be expanded under implementation of the Great Lakes Binational Toxics Strategy.

Funding Support: EPA supports State and local efforts through grants to worthwhile projects. Examples of current projects funded by EPA include: an exploration in Minnesota of innovative ways to regulate the release of mercury comprehensively, including from currently-unregulated sources, such as a mercury emissions "cap-and-trade" program; State mercury task forces, which are bringing together stakeholders to make and implement recommendations for sectors that use

or release mercury;[*] mercury "clean sweeps" that collect and properly dispose of household and small business stores of unneeded mercury; mercury pretreatment programs at sewage treatment districts; investigation of use of mercury in ethnic practices, and a variety of outreach efforts to small business. State business outreach efforts funded by EPA include a program to encourage heating, ventilation, and air conditioning contractors and suppliers to promote the use of non-mercury thermostats and to properly dispose of mercury thermostats that they replace, and outreach to hospitals and other medical care facilities to encourage them to avoid or limit the use of mercury-containing products and to properly manage the disposal of existing mercury. EPA will continue to fund State and local projects that create innovative ways to reduce mercury or that follow a path of proven success.

In addition, EPA will work with states to incorporate mercury reduction activities into the day-to-day work of state environmental agencies by making these activities a priority in Environmental Performance Partnership Agreements (EnPPAs). EnPPAs define the working relationship among state environmental agencies and describe the work that state agencies will do with federal funds.

Information and Coordination: EPA also plays an important role by providing information and facilitating information exchange about mercury among States. Currently, this function is most highly developed among the Great Lakes States, where EPA leads a Mercury Workgroup that promotes information exchange about mercury and encourages cooperation among local, state and federal agencies in their mercury reduction efforts. The workgroup has allowed participants to help each other develop more effective programs for the control of mercury, and has helped educate participants on the latest mercury-related research. It also provides a forum for coordination of mercury-related work among staff with responsibilities for different environmental media. The workgroup seeks to reduce mercury releases in the Great Lakes states through the regulatory process and through voluntary pollution prevention programs. Activities that the workgroup engages in include: identification of mercury sources; identification of alternatives to mercury use; refinement of public outreach information and materials; commenting on draft legislation and regulation; development of conferences, and updates on mercury-related research.

EPA will expand this role nationally under implementation of the Binational Toxics Strategy, with a Mercury Web Site and list-server to disseminate information about mercury sources and reduction opportunities more broadly, including to State and local governments outside of the Great Lakes basin. This effort will include publicizing model pollution prevention programs that State, Tribal and local governments can adopt.

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[*] For instance, Michigan's Mercury Pollution Prevention Task Force secured the commitment of the auto industry to eliminate the use of mercury switches used for convenience lighting.

In addition, EPA will support State, Tribal and local efforts to educate the public on appropriate ways to reduce mercury exposure. As part of this effort, EPA will continue to provide State, Tribal and local agencies with technical assistance in the development of fish consumption advisories that reflect local mercury levels and local fish consumption patterns, and which balance the risks of exposure to mercury with the health benefits of including fish in the diet.

Finally, the mercury reduction work undertaken through the Binational Toxics Strategy will be coordinated, as much as possible, with other ongoing national, binational, trilateral and international efforts, such as the Commission for Environmental Cooperation (CEC).

Legislation and Regulation,: Under the Binational Toxics Strategy, EPA plans to compile and disseminate information on model State, Tribal and local mercury-related legislation and regulation. In addition to the pollution prevention programs described above, individual States have developed legislation or regulations prohibiting incineration or landfilling of mercury-containing lamps and other devices, phasing out the use of mercury in dairy manometers and other products, and requiring manufacturers of mercury relays to develop take-back programs. Publicizing these innovative laws and regulations will provide a possible model for other governments to follow.

Recently, Region 5 has begun to coordinate with States on possible expansion of the "Universal Waste Rule" to cover additional mercury-containing wastes beyond the thermostats, batteries and pesticides encompassed by this regulation. Inclusion in the Universal Waste Rule can streamline waste handling requirements and encourage the safe disposal or recycling of mercury-containing products. EPA will consider expansion of this effort on a national basis.

EPA will assist States in adoption of regulations to control mercury emissions from medical waste incinerators and municipal waste combustors, and will work with States and sources to develop schedules for compliance with the regulations.

Assistance to Sewage Treatment Works: Local sewage treatment works will play an important role in mercury reduction through implementation of pretreatment programs that encourage or require industrial users and households to limit mercury discharges. EPA has funded model mercury pretreatment programs in Duluth, Minnesota and Detroit, Michigan and has developed a compendium of mercury pollution prevention information useful for pretreatment program managers. EPA will provide information to sewage treatment works nationwide on different strategies to reduce mercury releases. These strategies could be considered for development of required pollutant minimization programs, and State and/or Federal compliance assistance efforts. This outreach to sewage treatment works could be part of a multi-media approach for municipalities, including mercury reduction opportunities for all municipal "wastestreams": wastewater, solid waste, and air emissions.

Compliance Monitoring and Enforcement: Decrease further environmental contamination from illegal use/disposal of mercury through focused compliance monitoring and enforcement of

mercury restrictions and requirements. Focus compliance assistance and outreach, monitoring and/or enforcement on sectors/sources which are significant contributors of mercury loadings to the environment. Where enforcement actions are warranted, use Supplemental Environmental Projects (SEPs) to encourage pollution prevention activities or mitigate damage.

To further the Agency's goals to protect and enhance public health and the environment, in applicable circumstances EPA advocates the inclusion of Supplemental Environmental Projects (SEPs) in the settlement of environmental enforcement actions. A SEP is an environmentally beneficial project which a defendant agrees to undertake as part of such a settlement, but which the defendant is not otherwise legally required to perform. This may include cleaning up a damaged area beyond the regulatory requirements or providing some additional protection not required by regulation or statute. A defendant's willingness or ability to perform a SEP is considered as a factor in establishing the final penalty paid by the defendant. EPA particularly encourages SEPs in communities where there are environmental justice concerns, to help ensure that persons who spend significant portions of their time in areas, or depend on food and water sources located near where violations have occurred, are protected.

Office: Regions, Office of Air and Radiation, Office of Solid Waste, Office of Water, Office of Enforcement and Compliance Assurance

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