

ADVISORY COMMITTEE ON MERCURY POLLUTION



2003 ANNUAL REPORT

to the Governor, General Assembly
and Citizens of the State of Vermont
January, 2003

Committee Members:

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EXECUTIVE SUMMARY

This is the fifth annual legislative report of the Advisory Committee on Mercury Pollution, established to report on mercury contamination in the environment, health risks posed, and to review programs and methods to reduce contamination and health risk.

This report reviews: (1) the status of mercury product legislation in the region and Vermont's implementation of mercury product labeling; (2) status of mercury education and reduction efforts and initiatives; (3) status of mercury monitoring and research and monitoring needs in the environment; (4) Committee work plan for 2003; and (5) Committee recommendations.

Mercury Education and Reduction Efforts

- A subcommittee consisting of health care professionals, the Department of Health, and the Agency of Natural Resources initiated several efforts to educate women of childbearing age, parents of young children, pregnant and nursing mothers regarding mercury and fish consumption advisories. Efforts included distribution of approximately 5000 brochures and posters to health care professionals and patients.
- Municipal household hazardous waste programs continued to collect significant quantities of mercury-added products and elemental mercury from households and small businesses.
- The Agency of Natural Resources and the Vermont State Dental Society worked cooperatively to develop and disseminate environmental best management practices guidelines to approximately 350 dentists. These best management practices address proper handling of mercury and other hazardous wastes. A subcommittee was established to make recommendations on requirements to install dental amalgam separators in order to minimize release of mercury amalgam particles to wastewater.
- Voluntary efforts were initiated to collect mercury-containing auto convenience light switches from salvage yards and state vehicles prior to auction.
- The Agency of Natural Resources is working collaboratively in a new initiative with the Vermont Association of Hospitals and Health Systems to encourage voluntary mercury reduction programs at Vermont hospitals.

Vermont's Product Labeling Law

- The Agency of Natural Resources has reviewed nearly 200 labeling plans from mercury-added product manufacturers.
- This year, the Agency of Natural Resources reached agreement with fluorescent lamp manufacturers that are part of the National Electrical Manufacturers' Association (NEMA) on approved methods for lamp and package labeling. Lamps manufactured after November 30, 2003 will require a label in order to be offered for sale or use in Vermont.

Regional Mercury Reduction Efforts

Several states have adopted statutory provisions attempting to reduce mercury use and release that are summarized in this report.

Monitoring of Mercury in the Environment

Several ongoing studies are furthering our understanding of how mercury accumulates and is distributed in watersheds and fish. Priority areas of research and monitoring have been identified.

Committee Recommendations

The majority of the Committee recommends that H.14 (Comprehensive Mercury Management) passed by the Senate in 2002 be reconsidered by the Legislature.(*). The following modifications to H. 14 should be considered:

1. Include a repeal of 10 V.S.A. 6605(g) that addresses incinerator emissions of mercury. This provision has significant wording problems that make implementation difficult.
2. Prohibit mercury convenience lighting switches in vehicles manufactured after July 1, 2003.
3. Require auto manufacturers to share responsibility for removal and proper disposal of mercury switches in existing vehicles.
4. Prohibit the sale and installation of mercury-containing thermostats except for industrial uses, and other uses determined through an exemption process.
5. Product labeling requirements of 7107 – Remove provision that postpones effective date until states representing a population of 10 million or more have adopted similar provisions for greater regional consistency in labeling.
6. Mercury in Schools 7115 – Expand the scope of this section to require removal of existing mercury-added laboratory compounds and mercury-added measuring devices (such as manometers and barometers) from the lab premises.
7. State procurement preferences 7116 – Eliminate this section, as state government has a mercury procurement executive order in place that is more stringent (and is currently being implemented)
8. Funding should be sought to complete the replacement of mercury dairy manometers at Vermont dairy farms.
9. The Committee supports the state's participation in the Interstate Mercury Education and Reduction Clearinghouse (IMERC)
10. The Committee recommends that the Agency of Natural Resources coordinate with others to promote the sale and use of non-mercury Energy Star thermostats and encourage proper collection and management of these mercury-added thermostats taken out of service.
11. Support and provide funding as necessary for these priority research and monitoring needs:
 - a. Study the link between power generation and fish tissue mercury contamination in hydropower reservoirs.
 - b. Air monitoring at the Vermont Monitoring Cooperative's Underhill, VT air monitoring station.
 - c. Design and implementation of a fish tissue mercury indicator monitoring program that will serve as a long-term indicator of changes in environmental mercury contamination.

(*) Committee member, Ric Erdheim, does not support H.14 as passed by the Senate.

INTRODUCTION

This is the fifth annual report of the Advisory Committee on Mercury Pollution, which was established by the 1998 Vermont Legislature to address and report on mercury contamination in the environment, health risks posed, and to review programs and methods to reduce contamination and health risk.

Mercury in the environment is both naturally occurring and the result of human activities. It can be found in the environment in its elemental, inorganic, and organic forms. In its elemental form, it is a silver, liquid metal used in thermometers, electrical switches, fluorescent lights, thermostats and many other products. It can be combined with other elements to form inorganic compounds. Most of the mercury found in the environment is inorganic. Inorganic mercury primarily enters the environment through emissions to the air from several sources. Examples of sources include emissions of coal-fired power plants, municipal and medical waste combustors, and natural processes such as erosion of ores and volcanic activity. Mercury is persistent, mobile and bioaccumulative in the environment, meaning it is retained and concentrates in organisms. In aquatic systems, inorganic mercury can be converted to an organic form, methylmercury, which can build up in fish to high levels. Federal Food and Drug Administration (FDA) regulations established consumption advisories for commercial fish that are found to have high levels of methylmercury. Also, the State of Vermont has issued public health advisories to warn people about eating certain fish caught in Vermont waters that are contaminated with mercury.

The developing fetus and young children are a higher risk population because methylmercury in the mother's body may enter the unborn child and breast-feeding infants. Young children are at risk because their nervous systems are still developing and because of their lower body weight as compared to adults. Adults who consume large amount of contaminated fish on a regular basis may also be at risk.

This report is divided into the following sections:

- I. Status of Mercury Reduction Efforts and Work of the Committee in 2001
- II. Monitoring of Mercury in the Environment
- III. Committee Work Plan for 2003
- IV. Committee Recommendations

I. STATUS OF MERCURY REDUCTION EFFORTS AND WORK OF THE COMMITTEE

Mercury Product Legislation

Last year's Advisory Committee report recommended mercury legislation to reduce the use and release of mercury contained in consumer and commercial products. The Vermont Senate passed H.14 by a 19-11 vote. This was a comprehensive bill that addressed most of the areas of legislation recommended by the Advisory Committee in its 2001 and 2002 reports to the Legislature.

Other New England states have adopted mercury product legislation and western states have adopted portions of legislation prohibiting the sale or use of such items as thermometers and thermostats (See section on Regional Mercury Reduction Efforts)

Vermont's Product Labeling Law

In 1999, the National Electrical Manufacturers Association (NEMA) sued the State of Vermont and in federal court and obtained an injunction that prohibited the enforcement of mercury-added lamp labeling. The ruling was appealed by the State of Vermont, and the U.S Second Circuit Court of Appeals overturned the injunction. NEMA brought the case before the United States Supreme Court and the court declined hearing the case. This year, the Agency of Natural Resources negotiated with lamp manufacturers and agreed on lamp labeling to meet the intent of Vermont's law and regulations. Authorization was granted by the Agency of Natural Resources to allow lamp manufacturers a labeling alternative for their lamp products primarily due to space considerations on the product.

Most lamps will be labeled with the symbol of "Hg" (chemical symbol for mercury). Package and insert labeling will include an explanation of the symbol, together with a toll free telephone number and a web site for consumers to obtain disposal information for their state. Part of NEMA's alternative labeling approval includes a financial contribution to a third party (\$40,000 over a two-year period) to assist in an educational campaign to make "Hg" a recognizable symbol and to promote the recycling of lamps. To date, 18 lamp manufacturers have provided a labeling plan to the state for approval. The Agency has provided an extension to allow lamp manufacturers additional time to implement their labeling plans. With this extension, manufacturers must label all mercury-added lamps manufactured on or after November 30, 2003 in order to offer them for sale or use in the state of Vermont. Most lamp manufacturers have elected to label their lamp products nationally and, in some cases, worldwide.

Since the law passed in 1998, about 200 labeling plans have been reviewed for mercury-added products being sold for use in the state. These plans include labeling of mercury-added consumer products, (retail, industrial and commercial) including everything from thermostats to microscopes. There are a significant number of mercury-added product manufacturers that have not submitted plans as required by Vermont law. Efforts are still underway to identify and notify manufacturers of their requirements.

Mercury Education and Reduction Initiatives

The following is a brief summary of mercury education and reduction initiatives in Vermont that the Committee has reviewed or been involved with:

- ***Outreach to sensitive populations*** – A subcommittee was formed by the Advisory Committee to inform and educate sensitive segments of Vermont's populations regarding mercury and fish consumption advisories. It was concluded that more could be done to inform sensitive populations through Vermont's vast health care network. Focus areas for outreach include pregnant women, mothers of young children, nursing mothers and populations that consume large quantities of fish.

Accomplishments in 2002:

- 4,500 mercury in fish brochures distributed, (with a goal of 10,000), to health care professionals to provide information to the public.
- 1,500 mercury in fish posters developed and distributed to various health care offices and public locations.
- Presentations for OB/GYN and Pediatric Grand Rounds in hospitals.
- Mailings of brochures and posters to nearly 1,700 physicians.

- E-mail distribution to 700 health care professionals, advocacy groups and other interested parties - provided electronic copies of brochures, fish advisories and health-related information regarding mercury's effects on the developing fetus.
- Articles in health association newsletters on health effects of mercury to the developing fetus.
- Mailings of educational materials to childbirth educators, nurses, doulas(birthing coach and support), midwives, WIC, nursing mother programs, and pregnancy information services.
- ***Municipal Collections of Mercury*** – The table below shows amounts of mercury collected through municipal household hazardous waste programs over the last three calendar years from households and small businesses. Wastes typically collected include thermometers, thermostats, mercury-containing switches and mercury spill clean-up debris. Mercury-added lamp collections have increased about 25% from the previous year. Outreach efforts are planned to promote the recycling of fluorescent lamps in the commercial, industrial and institutional sectors, where recycling rates are believed to be relatively low.

Mercury Collection in Municipal Programs			
Type of Mercury Waste	Year		
	2000	2001	2002
Mercury Products/Debris*	972 lbs	1675 lbs	1069 lbs
Elemental Mercury**	25 lbs	161 lbs	120 lbs
Mercury-Added Lamps**	0.8 lb (141,000 ft)	1.4 lbs (248,200 ft)	1.8 lb (323,300 ft)

* includes the weight of mercury and non-mercury-containing components

** represents actual weight of mercury collected

- ***Mercury Switches in Autos*** – The Agency of Natural Resources and the Agency of Transportation initiated a program to replace mercury convenience light switches in its vehicle fleet with non-mercury switches. Mercury switches are now being removed from all state vehicles prior to auction.

The Agency of Natural Resources also piloted a voluntary auto switch removal program with four salvage yards. Salvage yard operators received training on switch removal. Over 300 switches were collected in the pilot.

In a further effort to reach salvage yards in the state, the Agency sponsored salvage yard workshops about environmental compliance issues. Information was mailed to about 150 salvage yards. Eight workshops were conducted at various locations across the state. As a part of these workshops, a mercury switch bounty program was developed to offer a monetary incentive for removing mercury switches from vehicles. Five additional salvage yards signed up for the program. The bounty program collected an additional 500 automobile mercury switches. The switches collected from both salvage yard programs represent nearly 2 pounds of mercury.

- ***Thermostat Collection Program*** – VT DEC has placed 33 collection containers at plumbing, heating and electrical wholesaler locations throughout the state for collection of discarded mercury thermostats (primarily from contractors). To increase awareness to contractors, DEC

notified over 2,000 heating and plumbing contractors and licensed oil, propane, and natural gas installers of the free disposal program. Over 300 thermostats have been collected at these locations.

- ***Mercury in Dental Offices*** –The Vermont State Dental Society (VSDDS) worked cooperatively with the Agency of Natural Resources to develop and disseminate environmental best management practices guidelines to 350 dentists in Vermont. These guidelines included best management practices for proper handling of waste mercury-containing dental amalgam. DEC staff presented at the Vermont State Dental Society’s annual meeting to more than 250 dentists, hygienists and dental assistants on the environmental best management practices and other mercury issues. DEC also had a booth at the two-day meeting to provide dental offices with information on proper waste management.

A dental amalgam separator subcommittee was formed to make recommendations to the Advisory Committee on incorporating dental amalgam separators into the best management practices guidelines. These devices are used to capture and further reduce fine dental amalgam particles in wastewater discharges. At some point in the future, amalgam separators will be required as a best management practice to minimize mercury discharges to wastewater. A pilot project will be conducted in 2003 to: (1) test a variety of amalgam separators in dental offices; (2) gather information on each type of unit such as convenience, effectiveness, ease of use, and maintenance needs; and (3) provide dental offices with an opportunity to observe separators first hand.

- ***Mercury in Health Care*** - The Vermont Agency of Natural Resources, Department of Environmental Conservation (DEC) and the Vermont Association of Hospitals and Healthcare Systems (VAHHS) have developed a program to encourage hospitals to reduce purchase and use of mercury-added products in hospitals and affiliated healthcare clinics. The program promotes the development of mercury reduction plans through education and technical assistance.
- ***Posting of Fish Consumption Advisories at State Access Areas*** - During 2002, the DEC Water Quality Division posted the text of the current fish consumption advisory, as well as other information (mercury in the environment, health effects of mercury and common misperceptions about mercury in fish) at many state public boating access areas throughout Vermont. Department of Health and DEC provided the printed materials for this purpose.
- ***School Presentations*** – In 2002, VT DEC staff made presentations on mercury in the environment to 18 schools, which included over 1,000 middle and high school Vermont students.

Regional Mercury Reduction Efforts

The Agency of Natural Resources regularly updates the Advisory Committee on regional mercury reduction efforts through its involvement with various regional groups. The following are significant results of regional efforts in 2003.

- The states of Connecticut, Maine, New Hampshire and Rhode Island have enacted various provisions of the New England Waste Management Officials’ Association (NEWMOA) model mercury product legislation. Connecticut and Rhode Island have adopted most provisions of the

model legislation including phase-out of certain mercury-added products based on the mercury content. Other states outside of the New England area are focusing on various provisions of mercury regulation. Ten states as well as various counties, individual cities and various health related associations have some form of mercury thermometer ban for sale and/or use. (For more details see **Appendix A**)

- NEWMOA and its member states have been participating in an interstate clearinghouse known as the Interstate Mercury Education and Reduction Clearinghouse (IMERC) to assist states in coordinating on various aspects of implementing mercury product legislation. The IMERC Clearinghouse is implementing a uniform notification process for manufacturers of mercury-added products and formulated products to provide a central location for submission. IMERC will be coordinating mercury product alternative labeling requirements. NEWMOA also facilitates state communications on mercury education and reductions efforts and legislative issues through its Mercury Work Group and web site.
- NEWMOA obtained an EPA grant to facilitate a regional education program for lamp recycling outreach in the New England area, with a goal of significantly increasing the rates of recycling of end-of-life lamps.

II. MONITORING OF MERCURY IN THE ENVIRONMENT

Several ongoing studies and monitoring efforts have yielded findings of consequence and significance to Vermont. Summary points of these studies and efforts are as follows:

- Studies in New Hampshire and Vermont indicate that mercury is significantly elevated in fishes of acidic, high elevation, forested lakes.
- Mercury levels are extremely low in fishes of eutrophic lakes in New Hampshire and Vermont (lakes that are nutrient and algae-rich). This finding is significant and should prompt the Vermont Department of Health and Agency of Natural Resources to re-evaluate fish advisories on eutrophic lakes where these advisories could be relaxed.
- Further information and publications will be forthcoming from the VT-NH REMAP Project in the coming year on mercury deposition to watersheds and the relationship between lake water quality and fish mercury.
- Mercury air monitoring at the Underhill, Vermont air monitoring station has stopped. EPA has earmarked \$100,000 for continued monitoring through UVM; however, these funds have not been secured by UVM at this time.
- Ongoing studies are showing that controlling sediment releases could significantly reduce mercury releases to streams in agricultural areas.
- A modeling project to estimate mercury loading and fate in Lake Champlain is progressing. This project will provide a better understanding of the accumulation of mercury in the lake.

- Studies by the US Geological Survey show that large precipitation events and the associated release of particulate matter to receiving waters can be responsible for the majority of mercury loading to waters on an annual basis.
- New data available from four lakes in southern Vermont show elevated levels of mercury in the sediments. Combined with other information, this suggests the possibility that there are regional mercury sources influencing waters in southern Vermont. One such possible source of release could be related to an historic mercury refining operation in the Albany, New York area.
- A group of scientists assembled under the Northeast Ecosystem Research Center have received a grant to develop maps of mercury contamination, maps of mercury risk to wildlife and humans, and models permitting prediction of mercury in fish tissue across New England and southeast Canada.

Research and Monitoring Needs

Three research and monitoring needs for Vermont have been identified and discussed at Advisory Committee meetings. These also appear in the recommendation section of the report and are as follows:

- Study the link between water level fluctuations in hydroelectric reservoirs and the increased levels of fish tissue mercury contamination observed in those reservoirs.
- Mercury monitoring activities at the Underhill air monitoring station have been temporarily halted. Given that funding has been earmarked through the EPA budget for this activity, it is important to take the necessary steps to resume monitoring at this station.
- Recent short-term fish tissue monitoring projects have suggested a need to develop a longer-term fish tissue-monitoring program, to serve as an indicator of changes in environmental mercury contamination. Funding is currently being sought to develop this program.

III. COMMITTEE WORK PLAN FOR 2003

1. Continue to provide testimony and information to legislative committees on proposed mercury legislation.
2. Continue to review environmental monitoring data, studies, and environmental research initiatives (state, regional and national) on all aspects of mercury contamination in air, soils, water, and biota to gain a better understanding of the ecological and human health risks in Vermont.
3. Continue to provide comment and review on revisions and enhancements to Vermont DEC's mercury emissions inventory and stay abreast of efforts to revise the regional mercury emissions inventory.
4. Review, comment, and advise on mercury education and reduction efforts and programs of the VT DEC, Department of Health, Solid Waste Districts and municipalities, and other private and non-profit organizations.

5. Continue to oversee efforts of DOH and DEC to improve outreach and education to the general public and sensitive populations on fish consumption advisories for both recreational and commercial fish.
6. Continue to oversee of efforts by the Agency of Natural Resources, its Departments, and other organizations, to post fish consumption advisories at all state-owned access points to waters of the state.
7. Review ongoing dental amalgam separator evaluation efforts by its amalgam separator subcommittee and provide recommendations for potential adoption as an amendment to current Best Management Practices Guidelines for dental offices.
8. Continue to review the status and effectiveness of manufacturer-sponsored mercury product collection and take-back programs for products such as thermostats, batteries, and medical products. Continue to review effectiveness of collection programs sponsored by the state and municipalities for products such as motor vehicle switches, appliance switches, electronic products and dairy manometers.
9. Provide comment to DEC on lamp recycling education and outreach efforts.
10. Continue to work in conjunction with the Dept. of Agriculture, Food and Markets to assist with securing funding for completion of the replacement and removal of remaining mercury dairy manometers at working and non-working farms throughout the state.
11. Monitor progress of mercury reduction efforts at hospitals and health care facilities in Vermont through collaborative efforts of the DEC and Vermont Association of Hospital and Health Care Systems.

IV. COMMITTEE RECOMMENDATIONS

Legislative Recommendations

The majority of the Committee recommends that H.14 (Comprehensive Mercury Management) passed by the Senate in 2002 be reconsidered by the Legislature.(*). The following modifications to H. 14 should be considered:

1. Include a repeal of 10 V.S.A. 6605(g) that addresses incinerator emissions of mercury. This provision has significant wording problems that make implementation difficult. (x)
2. Prohibit mercury convenience lighting switches in vehicles manufactured after July 1, 2003.
3. Require auto manufacturers to share responsibility for removal and proper disposal of mercury switches in existing vehicles. (**)
4. Prohibit the sale and installation of mercury-containing thermostats except for industrial uses and other uses determined through an exemption process. (**)
5. Product labeling requirements of 7107 – Remove provision that postpones effective date until states representing a population of 10 million or more have adopted similar provisions. (**)

6. Mercury in Schools 7115 – Expand the scope of this section to require removal of existing mercury-added laboratory compounds and mercury-added measuring devices (such as manometers, and barometers from the lab premises.
7. State procurement preferences 7116 – Eliminate this section, as state government has a mercury procurement executive order in place that is more stringent (and is currently being implemented)
(x)

Other Recommendations

8. Funding should be sought to complete the replacement of mercury dairy manometers at Vermont dairy farms.
9. The Committee supports the state’s participation in the Interstate Mercury Education and Reduction Clearinghouse (IMERC) (**)
10. The Committee recommends that the Agency of Natural Resources work with others to promote the sale and use of non-mercury Energy Star thermostats and encourage proper collection and management of these mercury-added thermostats taken out of service.
11. Support and provide funding as necessary for these priority research and monitoring needs:
 - a. Study the link between power generation and fish tissue mercury contamination in hydropower reservoirs.
 - b. Air monitoring at the Vermont Monitoring Cooperative’s Underhill, VT air monitoring station.
 - c. Design and implementation of a fish tissue mercury indicator monitoring program that will serve as a long-term indicator of changes in environmental mercury contamination.

Note:

- * Committee member, Ric Erdheim, does not support H.14 as passed by the Senate
- ** No vote by Committee member Ric Erdheim
- *** Abstention by Ric Erdheim
- x No vote by Committee member, Michael Bender

**APPENDIX “A”
States’ Mercury Legislation**

Legislative Provision	CA	CT	ME	MA	MI	MN	NH	OR	RI	VT
Mercury Product Notification		✓	✓				✓		✓	
Interstate Clearinghouse		✓	✓				✓		✓	
Bans on Certain Hg-Added Products		✓	✓				✓		✓	
Automobile w/switches ban	✓✓		✓✓					✓✓		
Novelty ban	✓*	✓*				✓*	✓	✓*	✓*	
Mercury fever thermometer ban	✓	✓	✓*	✓	✓ _W	✓ _W	✓	✓	✓	
Use in schools ban	✓*		✓		✓		✓		✓	
Dairy manometer ban		✓	✓			✓*			✓	
Thermostat ban			✓✓**					✓✓ _X		
Phase-Out and Exemptions		✓*	✓**						✓	
Labeling		✓*	✓***			✓***		✓ _X	✓*	✓***
Automobile labeling		✓	✓						✓	✓
Lamp labeling		✓*	✓ _y			✓ _y			✓ _y	✓
Disposal Ban	✓*		✓***			✓ _Z			✓*	✓***
Collection System Plans		✓*	✓**			✓ _Z			✓*	
Disclosure			✓*						✓	
Control on Sale of Elemental Mercury		✓	✓			✓	✓		✓	
Public Education and Outreach		✓	✓				✓		✓	✓
State Procurement			✓			✓ _Z			✓	

✓= Provisions that have been passed

✓✓= New provision passed – not included in model legislation

* = Provision was modified and passed by the legislature

**= Maine passed a bill requiring a phase-out and collection system for certain mercury-containing automobile switches, a legislative report on other opportunities for mercury product phase-out, and ban on the sale of mercury thermostats (exemptions may be granted if use provides benefit to the environment, public health or public safety when compared to available nonmercury alternatives) effective January 1, 2006.

***= Not model legislation – applies to specific list of products

_W= Minnesota and Michigan both have a sales ban on all mercury thermometers.

_X= Oregon has labeling for thermostats ONLY – their ban is on the installation of thermostats by contractors

_y= Lamp labeling on sales invoice

_Z= Minnesota has a statewide disposal prohibition for mercury-added products, legislation that requires a “good faith effort” by crushers to remove mercury switches from vehicles, and a “State Agency Program” regarding the purchase of mercury-added products.

States that have banned the sale of mercury fever thermometers:

California, Connecticut, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, Oregon, and Rhode Island.

By the Advisory Committee on Mercury Pollution:

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Vermont House of Representatives, House Natural Resources
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