

Mercury Dental Amalgam Collection and Recovery U.S. Federal and State Models



UNEP Mercury Waste Management Partnership Area
Meeting

Tokyo, Japan

March 9-10, 2010

Thomas Groeneveld

National Program Chemicals Division

Office of Prevention, Pesticides, and Toxic Substances

U.S. Environmental Protection Agency



Purpose

- Summarize the issue of mercury use, releases, and environmental fate of waste dental amalgam
- Provide examples of how U.S. EPA and the Commonwealth of Massachusetts are addressing collection and recycling



Dental Amalgam Use in the U.S.

- Use of dental amalgam has declined in the past two decades, but accounts for ~30 percent of dental fillings in the U.S.
- EPA estimates ~160,000 dentists working in more than 120,000 dental offices use or remove amalgam
- Mercury can be released when mercury-containing fillings are placed or drilled out, as well as disposal of excess amalgam stocks
- Waste amalgam materials that are flushed into chair-side drains enter the solid waste stream



Mercury Amalgam Waste in the Environment

- Publicly Owned Treatment Works (POTWs)
 - At ~90 percent efficiency, some amalgam in wastewater reaches lakes, rivers, and streams
- Medical Waste Incinerators
 - Medical waste “red” bags incinerated at facilities not designed to handle mercury component of amalgam
- Landfills
 - If disposed in garbage, can reach landfills and potentially leach into groundwater
- Fertilizer
 - Sludges from POTWs may be applied to agricultural lands as fertilizer



- Revised 2007 American Dental Association (ADA) “Best Management Practices for Amalgam Waste”
 - Amalgam separators
 - Precapsulated alloys
 - Proper disposal and recycling of captured amalgam
 - Avoiding the use of oxidizing cleaning agents and heat disinfection for amalgam containing materials



- Office of Water
 - EPA's 2008 Final Effluent Guidelines Plan did not identify the dental sector for an effluent guidelines rulemaking
 - EPA is pursuing voluntary measures to increase installations and use of amalgam separators and best management practices
 - Stated in the December 2008 Memorandum of Understanding (MOU) on Reducing Dental Amalgam Discharges
 - The purpose of the MOU is to have dental offices install and properly maintain amalgam separators, and recycle the collected amalgam waste



Amalgam Waste Management – U.S. EPA (cont'd)

- Office of Solid Waste and Emergency Response
 - EPA is developing strategies to enhance amalgam waste management in dental offices
 - When abbreviated, the specific actions spell “G.R.I.T.”
 - **G**ray bag it...
 - Discard excess amalgam wastes into a special waste “gray” bag
 - Never dispose of dental amalgam wastes in medical waste “red” bags or in office trash containers
 - **R**ecycle it...
 - Select a responsible dental amalgam recycler who will manage waste amalgam safely to limit the amount of mercury which can go back into the environment
 - **I**nstall it...
 - Install an amalgam separator in the office to capture up to 95 percent of the mercury leaving a dental office through drains
 - **T**each it...
 - Educate and train staff about the proper management of dental amalgam in the office



Amalgam Waste Management – States

- Voluntary
 - State and local voluntary management programs are based on or derived from the 2007 ADA guidance
- Mandatory
 - The Clean Water Act allows states to pursue more stringent actions than are called for at the Federal level
 - Nine states, including Massachusetts, have chosen to implement mandatory amalgam separator programs



Amalgam Waste Management – Massachusetts

- Initial efforts in June 1998, pursuant to regional U.S.-Canadian Action Plan
 - Plan set phased percentage reduction goals for 2003, 2010, and Long-Term
- In 2001, initiated voluntary program
 - Outreach conducted through State Dental Association and other professional meetings
 - Achieved only modest increases in use of amalgam separators
- In 2004, announced that regulations requiring amalgam separators and other BMPs would be adopted in 2006
 - Phase I: Incentives for early compliance (2004-2006)
 - Phase II: Adoption of mandatory requirements (2006)



- Phase I – Early Compliance Program
 - Relied on self-certification via Internet filings, subject to penalties
 - Enforced via compliance audits
 - Incentives
 - Waived permit fees
 - Retroactively recognized previously installed systems
 - Offered better incentives for earlier participation



Amalgam Waste Management – Massachusetts (cont'd)

- Phase II – Mandatory Program
 - Applies to dental practices likely to generate wastewater containing amalgam mercury
 - Includes general dentists, pediatric dentists, endodontists, prosthodontists
 - Exempts oral surgeons, periodontists, orthodontists
 - Requires
 - Install amalgam separator for every dental chair where waste amalgam is generated
 - System must remove 95 percent of amalgam waste based on ISO 11143 protocol
 - Maintain and operate separators according to manufacturer specifications
 - Use only pH neutral cleaners with vacuum lines
 - Recycle all mercury-containing amalgam waste
 - Keep records to document that program requirements are met



- Results
 - More than 70 percent of dentists certified under the voluntary compliance program
 - Regulations mandating the use of amalgam separators adopted on schedule in 2006
 - Compliance audits indicate more than 95 percent of covered practices installed separators



Contact Information

- For more information:

Damon Highsmith
U.S. Environmental Protection
Agency
MC 4303T
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460
highsmith.damon@epa.gov

Wendell Tomes
U.S. Environmental Protection
Agency
MC 5306P
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460
tomes.wendell@epa.gov

C. Mark Smith, Ph.D., M.S.
Massachusetts Department of
Environmental Protection
1 Winter Street
Boston, MA 02108
c.mark.smtih@state.ma.us