



# Mercury Risks - What Missouri Schools Can Do

The Missouri Department of Natural Resources has produced this bulletin to help schools reduce the risk of mercury exposure for students and employees. This information is intended to assist schools in avoiding mercury spills with their associated health threats and cleanup costs, conducting planning efforts to address mercury and mercury containing products, and in carrying out collection and disposal programs for mercury. School superintendents and principals, school board members, science departments, janitorial staff, home economics departments and parents may find this information useful.

## Mercury

Mercury is a naturally occurring element found in trace amounts in rocks, minerals, soils and the atmosphere. It is the only heavy metal that is liquid at room temperature. In the elemental form, mercury can vaporize with increasing temperature. Other forms of mercury include inorganic such as mercury salts and organic forms, such as methyl mercury.

The amount of mercury found in the atmosphere, soil and water has increased during the last hundred years due to human activities. Each year in the United States, 150 tons of mercury is emitted into the atmosphere. More than 50 tons is emitted by coal fired power plants alone. Waste incineration and improperly disposed of mercury products are responsible for the rest of the mercury released into the environment.

When mercury is exposed to the air, or heated, it is released into the atmosphere. Rainfall or snowmelt then carries the mercury into lakes and waterways. Once in the water, bacteria converts elemental mercury to methyl mercury. In this form, mercury accumulates in the tissues of some fish. When humans or other animals eat the fish, the mercury becomes a health risk. Mercury poisoning attacks the central nervous system in all humans. Unborn children and children under the age of 12 are at the highest risk, because their nervous system is still developing.

The greatest risk of exposure from elemental mercury in products such as fever thermometers is improper handling and disposal of spilled mercury. Mercury volatilizes quickly and is easily inhaled. Improper clean up with a vacuum, paintbrush or household cleaner increases exposure. Indoor air may be contaminated by mercury vapor from a broken fever thermometer, or other products that have gone unnoticed, or improperly cleaned up. At a high level, mercury can cause damage to the central nervous system, tremors, inability to walk, convulsions and even death.

Mercury is used in many items found in schools, such as thermometers, barometers, switches, thermostats, flowmeters, fluorescent lamps, bulk elemental mercury and laboratory reagents in chemistry and science labs. Most of these items can be replaced with mercury-free (or lower-mercury) alternatives. Dangerous and costly mercury spills occur at schools from improperly storing and mishandling these items. The Missouri Department of Natural Resources encourages schools to prevent spills by discontinuing the use of mercury compounds and



mercury-containing equipment, removing those materials from the school, and disposing of them in accordance with state and federal hazardous waste or universal waste regulations.

## **What Can School Officials Do Now?**

1. The best advice is to keep mercury out of your schools. Avoid buying mercury products and devices. Choose mercury-free substitutes for school purchases such as:
  - Alcohol or other spirit filled or digital thermometers
  - Electronic thermostats and switches
  - Aneroid blood pressure devices
  - Digital barometers and other gauges
2. Consider mercury a toxic material. Find out where mercury is in your school by conducting an inventory that includes type and quantity of device, location and who has management authority over that item.
3. Choose lower-mercury alternatives. There are currently no mercury-free fluorescent light bulbs manufactured, but low mercury bulbs are available. The Missouri Department of Natural Resources recommends all fluorescent bulbs be recycled.
4. Dispose of unwanted metallic mercury, mercury chemical compounds and reagents, and mercury-containing products in accordance with state and federal hazardous waste or universal waste regulations. For more information on proper disposal of fluorescent light bulbs, see the About Disposal and Recycling located on page 4 of this document.
5. Budget for hazardous waste disposal of mercury and other unsafe chemicals in schools.
6. Talk with teachers, school employees, parents, students and community officials about your plans for mercury education, reduction and elimination.

Minimizing mercury releases from improper disposal of broken thermometers, some paints, batteries, fluorescent light bulbs and other mercury containing items is important. It takes an effort from everyone to manage mercury wastes properly. Contact the department's Hazardous Waste Program at 1-800-361-4827 or (573) 751-7560 if you have questions about the content of this bulletin or other questions about mercury.

## **Cleaning up Small Spills**

A small spill is essentially the amount of mercury found in a fever or school science lab thermometer. Metallic mercury is liquid at room temperature and has no odor, but some of the metal will evaporate into the air and can be carried long distances. Because mercury is toxic when inhaled, you must be careful when handling and disposing of all items in the school that contain metallic mercury. If you break a thermometer, do not panic. The amount of mercury contained in an oral thermometer is small and does not present an immediate threat to human health. However, if it is not properly cleaned up and disposed of, it may present a health risk over time, particularly to children less than 12 years old and pregnant women.

If small amounts of mercury are spilled in a room:

1. Evacuate the spill area. Leave all shoes, clothing and other articles that were splashed with mercury at the spill site.
2. Wash skin exposed to mercury with soap and water.
3. Turn off heating/air conditioning to prevent mercury vapors from being spread throughout the building.

4. Isolate the spill site by closing interior doors.
5. Ventilate the spill area to the outdoors by opening outside windows for passive ventilation. If a window fan is available, use it as an exhaust fan to provide active ventilation to the outdoors.
6. Assemble cleanup supplies. If a mercury spill kit is not readily available, use the following items:
  - Rubber, nitrile, or vinyl gloves
  - Safety glasses
  - Eye dropper or syringe without a needle
  - Playing cards
  - Rubber squeegee
  - Duct tape or other heavy duty tape
  - Plastic container with lid or heavy duty ziplock bags
  - Flashlight

**NEVER USE A VACUUM CLEANER OR BROOM TO CLEAN UP A MERCURY SPILL.**

A vacuum cleaner will vaporize mercury and disperse it to the air, creating a worse hazard. A broom will break mercury into smaller beads, making it more difficult to clean up.

7. Dress appropriately. Remove jewelry from hands and wrists so the mercury does not combine (amalgamate) with other metals. Put on protective gloves and safety glasses. Wear old clothes that can be discarded if they become contaminated.
8. Inspect the spill site with a bright flashlight (the mercury beads shine like mirrors).
9. Pick up the mercury drops using one or more techniques:
  - If a commercial mercury spill kit is available, follow the manufacturer's instructions to clean up the mercury.
  - If a spill kit is not available carefully use a squeegee or playing cards to combine the beads and concentrate the spill into as small an area as practical.  
**Be very careful – mercury beads roll easily on a hard surface.**
10. Use an eyedropper or syringe to suck up the beads. Put the beads in a plastic container, zip lock bag, 35-mm film canister or other appropriate small container. Or use the sticky side of duct tape to grab the beads. Put the tape and beads into a zip lock bag or other appropriate container. Once all the visible mercury beads have been picked up, reinspect the area with a flashlight to look for more beads that may have migrated to any cracks, baseboards, etc. Continue cleaning up until all visible mercury has been removed.
11. Double bag all mercury-contaminated materials using heavy-duty ziplock bags.
12. If carpet has been contaminated, it may be necessary to remove it for disposal, depending upon the amount of mercury spilled.
  - Continue to ventilate the spill area to the outdoors for at least 24 hours after clean up has been completed.

**DO NOT DUMP MERCURY DOWN THE DRAIN OR INTO THE TRASH.** Call the Missouri Department of Natural Resources' Environmental Emergency Response's 24-hour hotline at **(573) 634-2436**. Staff can provide technical assistance with any cleanup or disposal questions. On-scene cleanup and air monitoring assistance may be provided for larger mercury spills. The

department may also provide direct assistance with disposal of elemental mercury. Do not hesitate to call the hotline with questions about mercury spills.

The law requires you to report any mercury spill greater than one pound, which equals the amount contained in about two tablespoons. To report a mercury spill, call the department's hotline listed above.

For larger mercury spills, follow the preliminary evacuation and isolation steps 1 through 5 and call the department's hotline number for on-scene cleanup assistance.

### **About Disposal and Recycling**

Unwanted devices that contain mercury such as thermometers, thermostats, barometers, manometers and mercury containing lamps may be managed as universal wastes. Universal wastes are a subcategory of hazardous waste with streamlined management requirements. For more information about universal waste see [www.dnr.mo.gov/pubs/pub2058.pdf](http://www.dnr.mo.gov/pubs/pub2058.pdf).

Mercury containing devices should not be disposed of in the regular trash. Arrange to dispose of these materials properly as universal waste.

Unwanted laboratory chemicals, including jars of elemental mercury, must be managed as hazardous waste and universal waste handling is not an option. Hazardous waste must be packaged, marked and labeled, transported and disposed of according to applicable state regulations.

**For more information about managing hazardous waste, visit the department's Web site at:**

[www.dnr.mo.gov/pubs/pub117.pdf](http://www.dnr.mo.gov/pubs/pub117.pdf)

If you generate less than regulated quantities, visit the department's Web site at [www.dnr.mo.gov/pubs/pub128.pdf](http://www.dnr.mo.gov/pubs/pub128.pdf)

Fluorescent lamps may be recycled. For a list of recycling locations, visit the department's Web site at [www.dnr.mo.gov/pubs/pub451.pdf](http://www.dnr.mo.gov/pubs/pub451.pdf)

For more detail on waste fluorescent lamps, visit the department's Web site at [www.dnr.mo.gov/pubs/pub24.pdf](http://www.dnr.mo.gov/pubs/pub24.pdf)

For Missouri hazardous waste disposal facilities that you may contact for price quotes visit the department's Web site at [www.dnr.mo.gov/pubs/pub968.pdf](http://www.dnr.mo.gov/pubs/pub968.pdf)

### **Web Sites for More Mercury Information**

*Mercury: In Your Community and The Environment*

[www.epa.gov/glnpo/bnsdocs/merccomm/merccomm.pdf](http://www.epa.gov/glnpo/bnsdocs/merccomm/merccomm.pdf)

Helps your students learn about the health and environmental concerns associated with mercury, where it is in their school and homes, and helps school officials and family members do something about it. Contains teacher and student activity materials.

*State Mercury Schools Programs*

[www.epa.gov/epaoswer/hazwaste/mercury/school.htm](http://www.epa.gov/epaoswer/hazwaste/mercury/school.htm)

Find out about state-sponsored programs to facilitate the removal of mercury-containing materials in schools.

### *Schools Chemical Cleanout Campaign (SC3)*

[www.epa.gov/epaoswer/osw/consERVE/clusters/schools/index.htm](http://www.epa.gov/epaoswer/osw/consERVE/clusters/schools/index.htm)

The SC3 Campaign provides information about how to remove potentially harmful chemicals from schools; emphasizes the implementation of preventive programs such as chemical management training for lab instructors and microscale techniques and raises national awareness of the issue of chemicals in schools.

### *Agency for Toxic Substances and Disease Registry Metallic Mercury Exposure Alert*

[www.atsdr.cdc.gov/alerts/970626.html](http://www.atsdr.cdc.gov/alerts/970626.html)

ATSDR's National Alert about metallic mercury in schools and ritual mercury use.

### *Getting Mercury Out of Schools and Communities*

[www.newmoa.org/prevention/mercury/schools/](http://www.newmoa.org/prevention/mercury/schools/)

Northeast Waste Management Officials Association (NEWMOA) developed outreach and assistance materials to assist communities in identifying and removing elemental mercury and products containing mercury from schools and from homes.

### *Mercury in Schools*

[www.mercuryinschools.uwex.edu/](http://www.mercuryinschools.uwex.edu/)

With funding from EPA, the University of Wisconsin Extension's Solid and Hazardous Waste Education Center (SHWEC) developed a mercury in schools project. Key project activities include: creating and maintaining a clearinghouse for information relating to reducing mercury usage, increasing mercury recycling and improving mercury management in schools, educating students and teachers about eliminating mercury and conducting workshops for educators and agency staff.

### *Mercury – Schools Topic Hub*

[www.glrppr.org/hubs/toc.cfm?hub=501&subsec=7&nav=7](http://www.glrppr.org/hubs/toc.cfm?hub=501&subsec=7&nav=7)

Great Lakes Regional Pollution Prevention Roundtable resources about mercury in schools.

### *Mercury in Necklaces and Jewelry*

[www.doh.wa.gov/ehp/ts/IAQ/MercuryNecklaces.html](http://www.doh.wa.gov/ehp/ts/IAQ/MercuryNecklaces.html)

Information about necklaces with mercury from Mexico that have become popular with children; pictures of the necklaces are shown. If the necklace is broken, the amount of mercury spilled can warrant a hazardous cleanup response and evacuation. Many states have issued health alerts about these necklaces and the risks that they pose to children and schools.

### **For more information call or write:**

Missouri Department of Natural Resources

Hazardous Waste Program

P.O. Box 176, Jefferson City, MO 65102-0176

1-800-361-4827 or (573) 751-6822 office

(573) 526-8922 fax

[www.dnr.mo.gov/env/hwp](http://www.dnr.mo.gov/env/hwp) Program Home Page