EAST TENNESSEE STATE UNIVERSITY

Facilities Management

Policy Number: 700.17
Title: Mercury Management Plan
Implementation Date: August 2010
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Purpose

The purpose of this Mercury Management Plan is to (a) establish guidelines to be followed when mercury is released or spilled into the environment, (b) outline disposal procedures and (c) provide alternatives that can be used for mercury substitution.

Sources of Mercury

Mercury is a naturally occurring element that is found in air, water, and soil. It exists in several forms: elemental or metallic mercury, inorganic mercury compounds and organic mercury compounds. Elemental or metallic mercury is a shiny, silver-white metal and is liquid at room temperature. If heated, it is a colorless, odorless gas. Elemental mercury is used in thermometers, fluorescent light bulbs and electrical switches. Inorganic mercury compounds (in the form of salts) are typically used as fungicides, antiseptics and/or disinfectants. Organic mercury compounds, such as methylmercury, are formed when mercury combines with carbon. Microscopic organisms convert inorganic mercury into methylmercury, which is the most common organic mercury compound found in the environment.

Please visit www.epa.gov/mercury for more information on all mercury related topics.

Potential Health Effects of Mercury

I. Short Term Exposure

Inhalation:
Mercury vapors are highly toxic via an inhalation route. Mercury causes severe respiratory tract damage. Symptoms include sore throat, coughing, pain, tightness in chest, breathing difficulties, headache, muscle weakness, liver changes, fever, and pneumonitis. Most inhaled mercury vapors are retained in the lungs and quickly passes into bloodstream.

Ingestion:
Mercury may cause burning of the mouth and pharynx, abdominal pain, vomiting, corrosive ulceration, and bloody diarrhea. Delayed death may occur from renal failure.

Skin or Eye Contact:
Causes irritation burns to skin or eyes. Symptoms include redness, pain and blurred vision. It may cause serious and/or permanent eye and skin damage.

II. Long Term Exposure

Chronic exposure through any route can produce central nervous system damage. Chronic exposure may cause muscle tremors, personality and behavior changes, memory loss, metallic taste, loosening of teeth, digestive disorders, skin rashes, brain damage and kidney damage. Mercury can cause skin allergies and accumulate in the body, especially in fat. Mercury can pass through the placenta of pregnant females and may damage the developing fetus affecting fetal brain and nervous system development. No evidence has been shown or provided to substantiate that mercury is a carcinogen.

Mercury as a Hazardous Waste

- Mercury is regulated by the EPA as a hazardous waste.
- Mercury cannot be disposed of down the sanitary sewer or thrown in the regular trash.
- Mercury waste must be managed according to all federal, state regulations as well as ETSU's Hazardous Waste Management Policy.
- Mercury waste must be properly labeled with an orange hazardous waste tag and stored in a sealable container. These tags are supplied by the Environmental Health & Safety Office.
- Mercury waste must be segregated from other waste streams when stored.
- The ETSU Environmental Health & Safety Office must be notified for a hazardous waste pickup using the form found at: http://healthsafety.etsu.edu/static/pickupform.

Mercury as a Universal Waste

- Universal wastes are EPA regulated wastes, but are not hazardous waste if properly recycled.
- Mercury-containing equipment means a device or part of a device that contains elemental mercury integral to its function.
- Universal waste regulations can be found in 40 CFR Part 273. The universal waste standards were created in an attempt to make it easier to collect the mercury-containing equipment and send them for recycling (or proper treatment and disposal).

- Examples that involve mercury include thermostats, batteries and fluorescent light bulbs.
- Universal waste mercury-containing equipment (i.e., each device), or a container in which the equipment is contained, must be labeled or marked clearly with any of the following phrases: "Universal Waste-Mercury Containing Equipment," "Waste Mercury-Containing Equipment," or "Used Mercury-Containing Equipment."
- A structurally sound container must be used for storage (best practice is to use original box or container), must have the accumulation start date clearly marked, container must be kept closed and waste streams must be segregated.
- Contact Environmental Health & Safety Office at extension 96029 for labels or to request a hazardous waste pickup use the form found at: http://healthsafety.etsu.edu/static/pickupform.

Mercury Spill: What NOT to Do

- **Never** use a vacuum cleaner to clean up mercury. The vacuum will put mercury into the air and increase exposure.
- **Never** use a broom to clean up mercury. It will break the mercury into smaller droplets and spread them.
- **Never** pour mercury down a drain. It may lodge in the plumbing and cause future problems during plumbing repairs. If discharged, it can cause pollution of the septic tank or sewage treatment plant.
- **Never** wash clothing or other items that have come in direct contact with mercury in a washing machine, because mercury may contaminate the machine and/or pollute sewage. Clothing that has come into direct contact with mercury should be discarded. By "direct contact," we mean that mercury was (or has been) spilled directly on the clothing, for example, if you break a mercury thermometer and some of elemental mercury beads came in contact with your clothing.
- **Never** walk around if your shoes might be contaminated with mercury. Contaminated clothing can also spread mercury around.
- **Never** touch mercury with bare hands.

Mercury Spills: What to Do

- The best practice is to prevent the mercury from spreading and to divert the mercury away from drains, cracks and crevices. **Once accomplished, contact the Environmental Health & Safety Office immediately at extension 96029.**
- Keep people who are not involved away from the spill area to limit exposure and to prevent the spread of contamination.
- The EH&S Office has a Nikro Mercury Recovery Vacuum specifically designed to cleanup both dry and liquid mercury.
- The Nikro mercury vacuum collects and controls both liquid mercury and mercury contaminated particulate matter and returns clean air to the environment.

- The vacuum system features a liquid mercury separator that allows the operator to collect and separate the mercury in a removable, sealable collection jar, a disposable filter bag, a 99.97% @ 0.3 micron HEPA filter and a high capacity activated carbon filter.
- The Environmental Health & Safety Office stocks mercury spill kits that consist of items such as mercury absorbent powder, nitrile gloves, dust pan, scraper, shoe covers and sealable bags.

Mercury Thermometer Replacement

Before you purchase a mercury thermometer, consider an alternative non-mercury thermometer

- Mercury from broken thermometers presents a hazard for faculty, staff and students in laboratory areas.
- Broken mercury thermometers create hazardous waste that is costly to clean up and costly to dispose of.
- Mercury presents a hazard to the local environment: mercury in broken thermometers in sinks eventually end up at the wastewater treatment facility where it can endanger microbes and interfere with the treatment process.
- Non-mercury thermometers are available that are safe and less toxic and are equally accurate.
- Non-mercury thermometers can be used in incubators, water baths, or other applications where mercury thermometers have been traditionally used.
- Most non-mercury thermometers are certified by the National Institute of Standard and Technology or the National Committee for Clinical Laboratory Standards to meet accuracy requirements.
- If you must use a mercury thermometer, please purchase a Teflon coated and/or non-breakable thermometer.

General Purpose Non-Mercury Laboratory Thermometers		
Thermometer Description (Range / Division)	**Vendor Catalog Number**	
	VWR-Enviro-Safe	**Fisher Scientific**
Total Immersion (e.g. Refrigerators, Freezers, Incubators, etc.)		
-100 to 50 C/1.0 C	NA	15-059-229
-20 to 110 C/ 1.0 C	61019-034	15-160-19

-20 to 150 C/ 1.0 C	61019-031	15-160-21
-10 to 210 C/ 1.0 C	61019-007	15-160-23
Partial (76mm) Immersion (e.g. Water Baths, Heat Blocks, Glassware, etc.)		
-35 to 50 C/ 1.0 C	NA	15-160-30
-20 to 110 C/ 1.0 C	61019-001	15-160-20
-20 to 150 C/ 1.0 C	61019-004	15-160-22
-10 to 200 C/ 1.0 C	NA	15-059-223
-10 to 260 C/ 1.0 C	61019-010	15-160-26
-1 to 101 C/ 0.1 C	NA	15-160-16

Mercury Product Disposal Control Act

- Enforceable starting January 1, 2011 by Tennessee Department of Environment and Conservation (TDEC).
- When performing an inspection, the TDEC inspector may/will ask:
  i) "Are you aware that the Mercury Product Control Act applies to your business"
  ii) "The Mercury Product Control Act requires proper recycling of mercury added consumer products rather than disposing of such products in the solid waste stream. Do you have a plan for recycling mercury added consumer products?"

Contact Persons

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Approved by: _____
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Date approved: _____

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