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EH&S FACT SHEET

Environment, Health and Safety Information for the Berkeley Campus

Mercury Hazards, Precautions, and Pollution Prevention

Mercury-containing devices are commonly used in laboratories and shops to measure temperature (thermometers and thermostats), pressure (barometers and manometers), liquid density (hydrometers), and humidity (hygrometers, psychrometers and barometers). Other potential sources of mercury include:

- Fluorescent lights
- Light switches in fleet vehicles
- Custodial supplies and old paint
- Blood pressure-measuring devices and some medicines used in medical facilities
- Sinks and floor drains from previous spills

Since mercury poses a health risk and can harm the environment if released, these items must be handled safely and disposed of properly when damaged or no longer in use. Mercury-containing devices, reagents, and supplies should be replaced with mercury-free alternatives.

Mercury Toxicity and Exposure Hazards

Mercury is one of the twelve toxic pollutants identified by the U.S. EPA that impairs San Francisco Bay. Because it bioaccumulates and persists in the environment, mercury should not be used on campus except for essential purposes. Your cooperation will help UC Berkeley maintain compliance with its wastewater discharge permit and protect Strawberry Creek and our environment.

Mercury is a potent neurotoxin and can cause long lasting, human health effects. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems. Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation. (Agency for Toxic Substances and Disease Registry). Mercury can present exposure hazards under the following conditions:

- Mercury thermometers in ovens may break if the oven's temperature rises above the thermometer's capacity.
- Inadequate pressure-system connections in may release mercury into the air at high velocities, which will atomize the mercury into extremely small particles and spread it over a large surface area.
- Mercury dumped into sink drains may accumulate in the drain and continuously emit vapors or be spilled during plumbing or construction work. Plumbers using a torch on the plumbing may be exposed to mercury vapors.
- Spills not cleaned up promptly may vaporize faster than the room's ventilation can safely remove toxic fumes.

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Mercury Pollution Prevention and Best Management Practices

Mercury Pollution Prevention at UC Berkeley involves several approaches. These include: 1) Reducing or eliminating mercury-containing reagents; 2) Promoting the use of non-mercury containing devices and chemical reagents; 3) Implementing a mercury-free purchase policy; and 4) Coordinating a mercury device collection and exchange program.
The following is a list of "best management practices" that can be implemented by faculty, staff, and students:

- Make a list of mercury-containing devices and reagents. Eliminate all nonessential mercury sources. Go to *ehs.berkeley.edu/mercuryfree.html* for an audit checklist and disposal information.
- Replace mercury devices with non-mercury substitutes if available.
- Avoid inhaling mercury vapors by working in a fume hood, or well-ventilated area, and away from heat.
- Store mercury-containing reagents and waste in tightly capped and shatter-resistant containers away from sinks and drains.
- Prevent skin contact, especially when handling organic mercury compounds such as methylmercury. See the Material Safety Data Sheet for guidance on suitable glove types. If unavailable, contact your lab safety supplier or EH&S for assistance.
- Have a mercury spill kit on site to handle small spills and train personnel on the proper use of the kit. EH&S Specialists are available to assist with larger spills (department will be recharged for disposal and any contractor costs).

Mercury Spills

Mercury spills from broken thermometers are the most common type of hazardous material clean up on campus. Broken thermometers are also the number one source of potential mercury discharges to the sanitary sewer system.

Spilled elemental mercury may hide under benches, continuously exposing staff and students to vapors. Mercury-containing devices may also be broken inside a laboratory fume hood, thereby releasing vapors into the air, or broken in a sink, potentially discharging the mercury to EBMUD's wastewater treatment plant. This can pollute San Francisco Bay because the wastewater treatment plant cannot remove heavy metals from its wastewater discharge.

Handling Mercury Spills

In the event of a large spill of elemental mercury, isolate the area to deny access. Then report the mercury spill to EH&S. EH&S will provide experienced staff and supplies to clean up the spill safely. Here are some precautionary steps to take while waiting for EH&S:

- Turn off equipment if the mercury spill occurred in a hot water bath or other heated object.
- Prevent mercury from entering sink or floor drains.
- Avoid mercury exposure by keeping away from the spill and closing doors, if possible, to keep vapors from escaping.
- Prevent anyone from walking through an area containing spilled mercury, to prevent the spread of contamination.

Mercury-Free Alternatives

Laboratories and shops can become virtually mercury-free by eliminating all nonessential mercury-containing devices and chemical reagents. Here are more examples of mercury-free alternatives that can be explored:

- General purpose, laboratory thermometers: Ever-Safe non-toxic thermometers (*www.ertco.com*) and Enviro-Safe non-toxic thermometers (*www.vwrsp.com*) are both filled with organic material and comparable in price and accuracy to mercury-filled thermometers.
- Digital or microprocessor-based laboratory thermometers: Excellent accuracy but more expensive than thermometers filled with organic material. Used batteries must be disposed of properly.
- Thermostats may contain a mercury capsule. Several manufacturers, including Honeywell and General Electric, have a thermostat-recycling program where the contractor can return the old thermostat to the manufacturer for proper disposal.

This fact sheet was developed jointly by East Bay Municipal Utility District (EBMUD) and the University of California Berkeley (UC Berkeley). For more information, please call (510) 642-3073.