

HOUSEHOLD APPLIANCE MERCURY SWITCH REMOVAL MANUAL

2018 update



Special Thanks to the following people and organizations for their contributions in the development of this manual:

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or

<http://dec.vermont.gov/assistance/compliance/publications/brochures>



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6.0 SOLID WASTE PLANNING ENTITIES

(Solid Waste Management Entity map) – For detailed information about your town go to:

<http://dec.vermont.gov/waste-management/solid/local-districts>

1.0 HOUSEHOLD APPLIANCE MERCURY REMOVAL

Safety Note: Proper personal protective equipment should be used at all times (i.e., safety glasses, gloves, Tyvek suit and in the event of a spill a respirator and mercury cartridges). In addition, spill equipment and storage material should be on-hand prior to any mercury-added device removal.

All appliances should be unplugged from an electrical outlet prior to any mercury switch removal. Appliances that have had these devices removed should be disabled to prevent future use (i.e., cut the electrical cord, or disable the gas feed line). All appliances that have had their mercury switches removed should be handled as scrap metal for recycling (not to be reused as a home appliance). All other hazardous components must be properly removed and disposed of (including but not limited to chlorofluorocarbons (CFCs) and polychlorinated biphenyls (PCBs)) prior to scrap metal recycling.

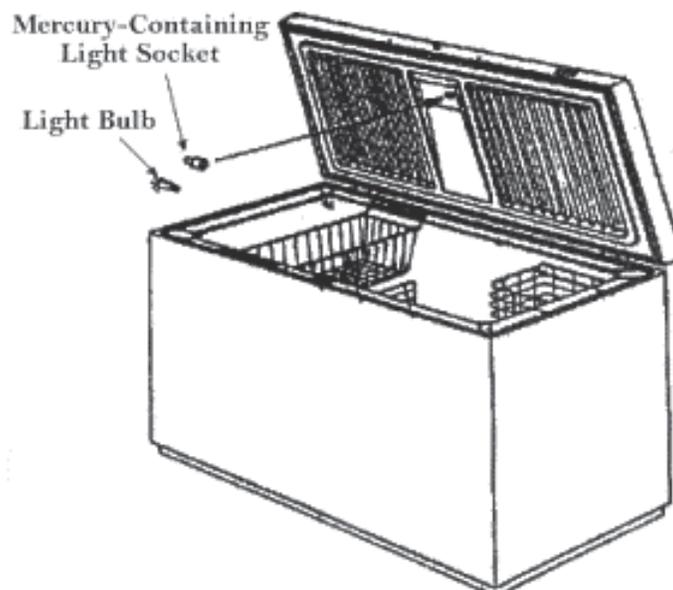
In case a switch breaks during the removal process, please follow the mercury spill clean-up instructions included in 5.1 mercury spills fact sheet at the end of this guide.

Note: Once these mercury-added components are removed, proper handling, storage and disposal are described on page 14 and the attachments at the end of this guide.

1.1 Chest Freezers

Some chest freezers are made with a mercury switch inside the freezer cover light socket (see Figure below). The mercury engages two contact points when the lid is opened thus completing the electrical circuit and turning on the light. All freezer manufacturers have stopped using mercury as a switching mechanism and begun using a mechanical switch by January 1, 2000. If there is no visible push button switch mechanism, the freezer is likely to have a lid mercury tilt switch.

Chest Freezer with Mercury-Containing Light Socket.



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The following procedure should be used for removal of the mercury tilt switch.

CHEST FREEZER MERCURY SWITCH REMOVAL

ESTIMATED REMOVAL
TIME: 1-5 MINUTES



STEP 1.

Open the freezer lid and look for a manual switch, similar to the one shown above. If it has a manual switch, the appliance can be handled as scrap metal (after removal of CFCs).



STEP 2.

Locate the light socket on the underside of the lid (on some freezers you may have to remove a plastic light cover).



If there is no manual switch, proceed to **STEP 2.**

STEP 3.

Remove the light bulb and properly discard.



STEP 4.

Remove the plastic housing (either by unscrewing it or breaking it off).



STEP 5.

Gently pull the light socket out of its mounting bracket (due to some lights having an in-line mercury switch see Reference Photo 2 below).



STEP 6.

Cut or remove the attached wires.



STEP 7.

Remove and properly dispose of the entire light socket.



REFERENCE PHOTO 1.

Assorted mercury freezer switches for disposal.



REFERENCE PHOTO 2.

Chest freezer light with an inline mercury switch (glass ampule).



1.2 Washing Machines

Mercury switches were used in a small number of washing machines manufactured prior to 1972 because of their ability to reliably function in a high-moisture environment. Most washing machines with mercury switches will have passed through the recycling stream by 2010. Mercury switches were used for two different applications in washing machines, both of these uses were for consumer protection.

One application of the mercury switch was used to detect a lid opening and engage a brake to quickly stop the washer drum from moving. This feature is particularly important when the washer is in a spin cycle because it reduces the risk of a consumer being injured by reaching into a spinning basket. This switch is located between the washer tub and the cover for the tub area of the washer and is activated when the lid of the washer is lifted.

Another use for mercury switches in washing machines was in the dynamic stabilizing system to prevent a severe out-of-balance condition (only on certain models). This switch worked by breaking the circuit when the washing machine was severely out of balance. This switch is located on the back of certain washing machine models and is activated when the washing machine is severely out of balance.

These switches can be identified and removed using the following procedures.

WASHING MACHINE MERCURY SWITCH REMOVAL

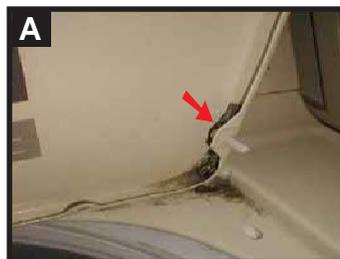
ESTIMATED REMOVAL
TIME: 5-10 MINUTES



STEP 1.

Open the lid on the washer and look for a non-mercury mechanical switch. These switches come in various sizes, shapes and locations. You should also be able to hear an audible “click” when a mechanical switch engages and disengages (with the opening and closing of the lid). If there is no mechanical switch continue to STEP 2. Photos A and B are examples of non-mercury mechanical switches.

Non-mercury mechanical switch examples:



A) back tab switch



B) front tab switch.

Once you have determined that there is no mechanical switch, the following procedure can be used to remove the mercury switch.

STEP 2.

Pry off the top of the washing machine as shown in figure “A”. or remove any fasteners from the lid as shown in figure “B”.



STEP 3.

On the underside of the lid, attached to the lid mounting rod, is an encapsulated mercury switch.



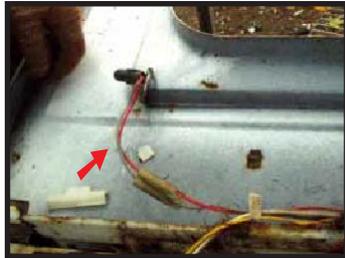
STEP 4.

Remove the switch from the bracket.



STEP 5.

Cut or remove any attached wires.



STEP 6.

Properly dispose of the entire washing machine mercury switch.



Another use for mercury switches in washing machines was in the dynamic stabilizing system to prevent a severe out-of-balance condition (only on certain models). Only through removal can you distinguish between a manual switch and a mercury switch. The mercury will be visible.

SEVERE OUT-OF-BALANCE SWITCH REMOVAL

ESTIMATED REMOVAL TIME: 5-10 MINUTES



STEP 1.

Locate the dynamic stabilizing switch on the back of the washing machine.



STEP 2.

Remove the fastening bolts.



STEP 3.

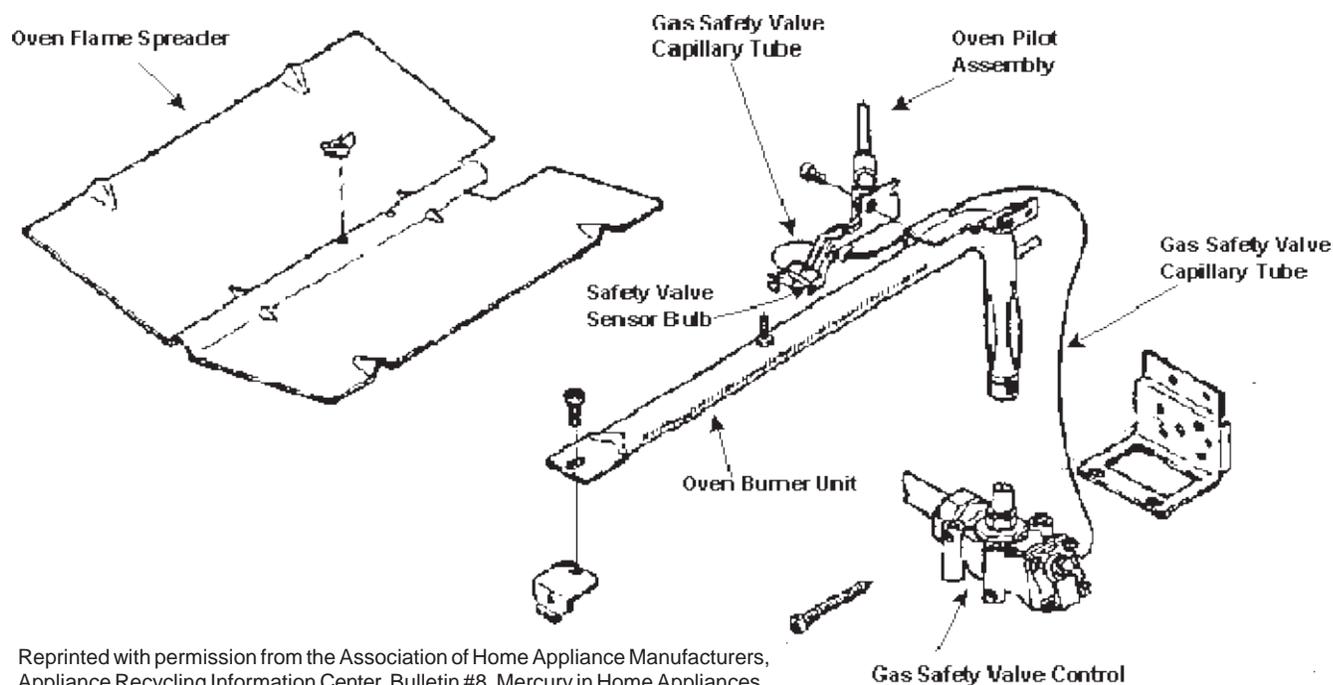
Disconnect the attached wires and properly dispose of the switch.



1.3 Gas Ranges

Gas ranges are ignited using either an electronic ignition system or a pilot-light. Pilot-light ranges require a mechanical safety device to detect whether the pilot-light is on and shut off the supply of gas to the burner when the pilot-light is not burning. Otherwise, the potential exists for a dangerous quantity of gas to build up in the oven. The diagram on the following page depicts the mercury containing control device on the gas burner assembly.

Gas safety valve (flame sensor) assembly.



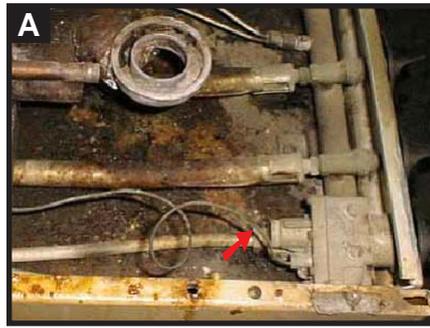
Reprinted with permission from the Association of Home Appliance Manufacturers, Appliance Recycling Information Center, Bulletin #8, Mercury in Home Appliances.

The gas burner is located beneath the oven cavity in the broiler pan. (*Note: All appliances manufactured after March 1, 2000 should be labeled if they incorporate a mercury-containing device.*) Gas ranges contain many temperature sensing probes and switches. The following procedure shows you how to distinguish the non-mercury probes and switches from the mercury switches (many times within the same appliance). Many of your stainless-steel safety valve capillary tubes and sensor bulbs are mercury-containing devices while copper safety valve capillary tubes and sensor bulbs are non-mercury containing devices. **As a general rule, magnetic metals are mercury-containing probes while non-magnetic metals are non-mercury containing probes.** This may be difficult to distinguish with baked on food. What may appear copper maybe stainless steel coated with baked on food. Removal of any baked-on food maybe necessary prior to determining metal type. Use of a magnet can also be helpful in making this determination.

Temperature capillary tubes and bulbs found within ovens or below upper burners are usually copper probes. A copper probe is good indication of a non-mercury containing device. These capillary tubes and bulbs are instead filled with an oil or sodium-potassium mixture. Photos A thru D on the following page show some examples of non-mercury probes.

NON-MERCURY TEMPERATURE PROBES

These photos are examples of non-mercury temperature probes in a gas range and oven. Photos A and B show the top view of a gas range after the burner surface has been removed. **Note that these capillary tubes and bulbs start at the temperature control knob.**



Photos C and D show the oven control temperature capillary tubes and bulbs (top of the oven cavity) which continue from the oven control knob into the oven cavity.



If you have determined that the gas oven capillary tubes and bulbs are mercury containing, the following procedure can be used to identify and remove the mercury gas safety valve control assembly.

GAS RANGE MERCURY GAS SAFETY VALVE CONTROL ASSEMBLY REMOVAL PROCEDURE

ESTIMATED REMOVAL TIME: 15-20 MINUTES



STEP 1.
Remove the broiler pan drawer.



STEP 2.
Once the drawer is removed you can view the burner assembly inside.



STEP 3.
When viewing the burner assembly, the small capillary tube (pointed out) is indicative of a mercury sensor switch.



STEP 3A.
Burner assemblies without a capillary tube but instead with an electronic pilot flame sensor (identifiable by the two wires) are **non-mercury**.



STEP 3B.

For gas ranges with a bracket covering the pilot, simply bend the bracket out of the way to view the wires indicating an electronic pilot sensor (non-mercury sensor).



Ranges without a capillary tube can be sent to scrap metal after making sure there is no fluorescent backlighting (see STEP 16) or PCBs.

For ranges with a capillary tube, **proceed to STEP 4.**

STEP 4.

If you have a capillary tube (like the one in the photo), you will now have to remove the burner assembly, valve and all attached gas fittings.



STEP 5.

Start by removing the key (sometimes a screw or a pressure fit) holding the burner assembly in.



STEP 6.

With the burner assembly loose, **proceed to STEP 7.**



STEP 7.

Disconnect the gas feed line by loosening the fitting or cutting the gas line.



STEP 8.

Disconnect the pilot gas feed line by loosening or cutting (there may sometimes be two feed lines).



STEP 9.

Remove the two screws holding the gas safety valve control in place.



STEP 10.

The entire burner assembly and valve are now ready to be removed. Note there is no screw or pin holding the oven burner unit, this is an example of a pressure fitting oven burner unit.



STEP 11.

Gas range with the oven burner unit and gas safety valve control removed.



STEP 12.

The removed oven burner unit and gas safety valve control.



STEP 13.

Remove the screw holding the gas safety valve control and gas safety valve capillary tube and bulb to the oven pilot assembly.



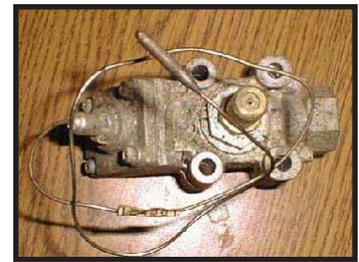
STEP 14.

Carefully pull the gas safety valve capillary tube and safety valve sensor bulb back through the bracket.



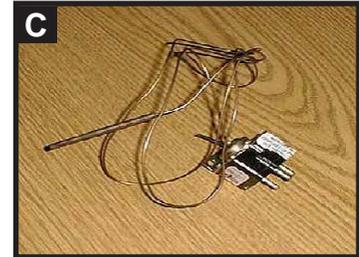
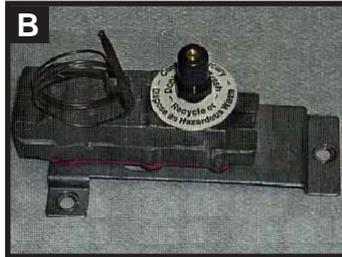
STEP 15.

The entire gas safety valve control, gas safety valve capillary tube and safety valve sensor bulb are now ready for proper disposal.



EXAMPLES OF SOME MERCURY GAS SAFETY VALVE CONTROLS, CAPILLARIES AND BULBS

Photos A & B show complete mercury gas safety valve control, capillary and bulb. Photo C shows a gas auto pilot probe.



GAS RANGE FLUORESCENT BACKLIGHTING REMOVAL

ESTIMATED REMOVAL TIME: 1-2 MINUTES



STEP 16.

Prior to disposal, all stoves should be inspected to make sure that there is no fluorescent backlighting or PCBs. Some backlighting contains fluorescent bulbs and PCBs that come in various shapes and sizes (in addition to the one shown in the photos) and should be carefully removed and disposed of properly.



1.4 Gas Hot Water Heaters

Although all the current literature states that mercury was not used in residential hot-water heaters, the following procedure has been included to help prevent any mercury-added thermocouples from entering the waste stream and eventually the environment. Use the following procedure to properly identify and remove any mercury-containing thermocouples (usually commercial hot-water heaters of 100 gallons or more).

GAS HOT WATER HEATER MERCURY THERMOCOUPLE REMOVAL

ESTIMATED REMOVAL
TIME: 5-10 MINUTES



STEP 1.

Locate the temperature control unit.



STEP 2.

Determine if there is an electronic flame sensor (determined by the presence of wires) or if there is a mercury thermocouple.



STEP 3.

Use a magnet to determine if it is indeed a mercury probe (non-magnetic probes are non-mercury).



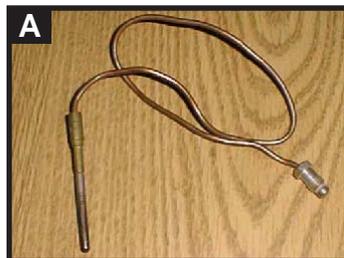
STEP 4.

If the probe is mercury, simply remove the bottom of the heater and loosen the nut attaching the probe. Then properly dispose of the mercury thermocouple.



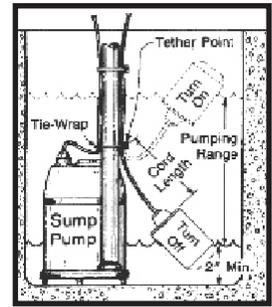
PHOTO A.

A non-mercury temperature probe. Notice that this probe is copper, which is a good indication of a non-mercury containing device.



1.5 Sump and Bilge Pumps

Another use for mercury was as a switch in sump and bilge pumps. This switch, which functioned very reliably in the high moisture environment, turned on and off based on the corresponding water level (see sump pump diagram at right). As the water level rises, so does the float ball and wire (a wire attached to the float is a good indication of a mercury sump pump) which would then tilt the mercury switch, completing the electrical circuit that turns on the pump. As the water level receded the electrical circuit would then be broken, and the pump would turn off.



Basic sump pump operation (mercury switch). Reprinted with permission from Purdue University.

SUMP PUMP MERCURY REMOVAL

ESTIMATED REMOVAL TIME: 1-2 MINUTES



The sump pump on the left is an example of a mechanical sump pump. This pump works on the same principle that as the float ball rises with the water it would turn on the pump (mechanical switch) and when the water recedes it would sink down with the water and shut off the pump. As can be seen in the photo on the left, a metal guide is used instead of a wire. This is a good indication of a non-mercury sump pump.



Sump pump float containing mercury.

A mercury-free sump pump. Notice the metal guide and no attached wires.

Once you have determined whether it is a mercury sump pump, the wire attaching the float can simply be cut and the whole float properly disposed of (see photo at right above).

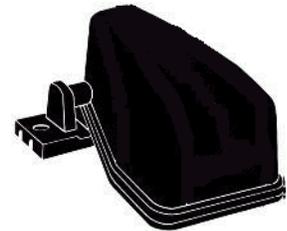
BILGE PUMP MERCURY REMOVAL

ESTIMATED REMOVAL TIME: 1-2 MINUTES



Bilge pump containing mercury.

Bilge pumps work on the same principle as a sump pump. By rotating on a stationary point (see drawing on right) with the fluctuations in water level either up or down, the bilge pump would turn on or off. Several of the newer models use this method with a rolling steel ball instead of mercury to complete the electrical circuit. This can be determined by simply shaking the bilge pump. A steel ball bearing will be easily discerned from liquid mercury by the clicking sound of the rolling steel ball.



Automatic switch bilge pump.

Once you have determined it is a mercury bilge pump, you can simply remove the entire pump and properly dispose.

2.0 MERCURY HANDLING, STORAGE AND DISPOSAL

Once mercury devices are removed, they should be properly handled, stored and disposed. The handling, storage and disposal protocols covered below are a best management strategy for individuals or businesses (non-profit and for profit) that generate less than 11,000 pounds of universal waste at any time (all universal wastes combined). Individuals or businesses who will be generating more than 11,000 pounds should refer to Subchapter 9, the Universal Waste Management Standards in the State of Vermont Hazardous Waste Management Regulations.

For your information, attached at the end of this guide are two mercury fact sheets: ***Mercury Spills*** and ***Fluorescent and HID Mercury Containing Lamps***, which summarize handling, storage and disposal requirements for these products.

2.1 Handling

A mercury-containing switch or product should always be handled in a way that will prevent breakage. Also, when removing mercury or mercury-added components from a product, do so only over or in a containment device that will collect and contain any mercury released in the event of a mercury-added product breaking. Be sure to keep spill clean-up kits (See Section 3, Mercury Spill Clean-up) and equipment readily available and always ensure that there is adequate ventilation. ***Any spilled mercury or any contaminated clean-up materials must be handled as a hazardous waste. For large spill clean-ups (more than 1 or 2 tablespoons) a firm specializing in mercury clean-up should be acquired (see Mercury Spills Fact Sheet).*** Anyone handling mercury or mercury-added products should use proper personal protective equipment (latex gloves, Tyvek suit, safety glasses and a respirator with mercury cartridges if cleaning up a mercury spill) and be thoroughly familiar with proper mercury handling and emergency procedures.

2.2 Storage

All mercury-containing switches or products must be stored in containers that will prevent any breakage or leakage. These containers must be closed, structurally sound and compatible with the mercury-added products being stored. All containers of mercury-added products must be properly labeled with one of the following; "Universal Waste- Mercury-added Product(s)", or "Waste Mercury-added product(s)" or "Used Mercury-added products" and stored for no more than one year.

2.3 Disposal

Properly contained and labeled mercury-added products can be disposed of in three possible disposal routes. These are:

- Disposal through a local Solid Waste District, Alliance or Municipality. This is usually done through Household Hazardous Waste Collection events or facilities (see Attachment "Solid Waste Planning Entities" for list of Solid Waste Districts, Alliances and Municipalities).
- Disposal through a hazardous waste transporter (see 4.0, page 17)

3.0 MERCURY SPILL CLEAN-UP

MERCURY SPILL KIT

Most spill/safety equipment suppliers have spill kits for purchase. Those removing and collecting mercury on a continued basis should consider adding a commercially available spill kit to the supplies listed below. If a spill kit is not available; the following supplies should be on hand in the event of a mercury spill.

- index cards
- respirator with mercury vapor cartridges
- sulfur powder
- flashlight
- rubber squeegee
- zinc or copper flakes
- tape
- Ziploc plastic bags
- paper towels
- plastic dust pan
- wide mouth plastic container with cover
- plastic trash bags
- latex gloves

EMERGENCY MERCURY SPILL CLEAN-UP PROCEDURE

This clean-up procedure is only intended for small mercury spills. If the spill involves more than one or two tablespoons of free mercury or the material has splattered over a sizeable area, is in cracks and crevices or other difficult to clean places or is on a non-disposable porous item such as wall to wall carpeting or upholstery, ***we recommend you retain an environmental firm with the equipment and expertise to perform the cleanup (see attached Mercury Spills Fact Sheet) and call the Vermont Spills Hotline at 1-800-641-5005.***

- 3.1.1 Wear latex gloves to prevent skin contact. Keep your hands away from your face-especially your eyes, nose and mouth. ***Before beginning any spill clean-up, make sure that the area is adequately ventilated or you have a respirator with mercury vapor cartridges.***
- 3.1.2 Carefully pick up any broken pieces of glass (***NEVER SWEEP OR VACUUM MERCURY***). Place them on a paper towel or tissue. Wrap or fold the paper towel, and place into a leak-tight plastic bag, sealable plastic container, or glass jar.
- 3.1.3 Sprinkle sulfur powder on the spill area to control mercury vapors. Then, working from the outside of the spill area toward the center, push small mercury beads together with a card, stiff paper, or squeegee to form larger droplets. Put droplets into a leak-tight plastic bag, plastic container, or preferably a glass jar with a lid.
- 3.1.4 Use the sticky side of a two-inch (or wider) duct or masking tape to pick up any remaining glass or mercury beads. Pay special attention to cracks and crevices. Place tape and debris in a leak-tight plastic bag, sealable container, or a glass jar.
- 3.1.5 Use a flashlight to look around the spill area. The light will reflect off the shiny mercury beads and make it easier to see them.
- 3.1.6 Sprinkle sulfur powder on the spill area after cleaning up any visible beads of mercury, a color change from yellow to brown indicates that mercury is still present, and more cleanup is needed.
- 3.1.7 Sprinkle zinc flakes or copper flakes (available at hardware stores) to amalgamate any small amounts of mercury that may remain.

- 3.1.8 When finished, carefully remove latex gloves and place them in a leak-tight plastic bag, sealable plastic container, or glass jar. Do not touch the glove fingertips or parts that may have come in contact with the mercury. Place all the closed containers in a double plastic bag and tie the opening. Properly dispose through a hazardous waste transporter (see page 17, or call your Solid Waste District, Alliance or Municipality (see Solid Waste Planning Entities map).
- 3.1.9 Thoroughly clean your hands and body. ***Never wash contaminated clothing in a washing machine or remove contaminated clothing or apparel from a spill site. This will help prevent further site contamination.*** These should also be disposed of properly.

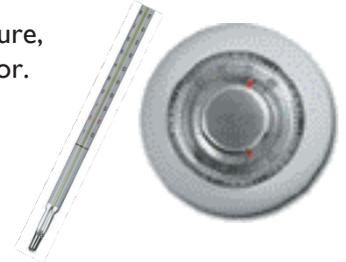
4.0 HAZARDOUS WASTE TRANSPORTERS

The following is a partial list of companies that offer hazardous waste transportation. This list should in no way be considered a recommendation or endorsement by the Vermont Department of Environmental Conservation.

Company	Phone	Address	Town	State
Safety-Kleen	802-479-1200	23 West Second St.	Barre	VT
Care Environmental		10 Orben Drive	Landing	NJ
Clean Harbors	860-583-8917	761 Middle St.	Bristol	CT
Clean Venture	508-872-5000	133-138 Leland St.	Framingham	MA
ENPRO Services of Vermont, Inc.	802-923-1970	54 Avenue D	Williston	VT
Environmental Products and Services of Vermont	802-862-1212	273 Commerce St.	Williston	VT
EQ Northeast	508-384-6151	185 Industrial Rd.	Wrentham	MA
Heritage Environmental Services	518-452-7301	10 Apollo Dr.	Albany	NY
Maine Labpack	207-767-1933	175 Lancaster St., Suite 208L	Portland	ME
Moran Environmental	781-815-1104	75-D York Ave.	Randolph	MA
PSC Environmental Services	401-265-5717	275 Allens Ave.	Providence	RI
Tradebe Environmental Services	800-345-4525	410 Shattuck Way	Newington	NH
Triumverate				
Veolia Environmental Services	1-800-354-2382	398 Cedar Hill Street	Marlboro	MA
Accuworx USA	802-522-1306	21 Metro Way	Barre	VT
Photech Environmental Solutions	905-938-9465	600 Read Road	St. Catharines	ON

FACT SHEET: Mercury Spills

Mercury is a natural substance that can be found in the environment. At room temperature, metallic mercury is a shiny, silver liquid that can evaporate into a colorless, odorless vapor. Mercury is harmful to both humans and wildlife and is found in many different products. When mercury is contained in thermometers there is very little chance of exposure. If the item breaks, mercury can be released. The small amount of mercury from a broken “fever” thermometer is unlikely to cause health problems if the spill is promptly, safely, and properly cleaned up.



Can I clean up a small spill in my own home?

You can probably clean up a small spill by yourself if the following is true:

- The spill is a small amount, less than or equal to one household thermometer.
- The spill is limited to a small area and mercury has not been spread around.
- The spill is on a hard surface like tile, linoleum or wood that is in good condition.
- The spill is on a small porous item like an area rug, a blanket or clothing that can be safely and appropriately disposed of as indicated below for mercury debris.

If the spill involves a large area, has been spread around, is in cracks and crevices or other difficult to clean places, or is on non-disposable porous item such as wall to wall carpeting or upholstery, follow steps  to  below then contact the emergency spill program at - **800-641-5005**

For information on broken fluorescent lamps visit www.mercvt.org or call **-855-63-CYCLE** (toll-free in VT). During non-work hours, contact the Northern New England Poison Center at **-800- 222-1222**

How can I clean up a small spill in my home?

-  **1.** Open windows to ventilate the area. Close off the room from other rooms in your house. Shut the door and close any air pathways (like floor or ceiling grates, air conditioning or heating vents) which will circulate mercury vapors into other areas of the house.
-  **2.** Keep pets, children (especially infants and young children) and pregnant women out of the room. Isolate the area - Do not walk on the mercury or track it into other areas of the house.
-  **3.** Wear disposable gloves if at all possible.
-  **4.** Use stiff cardboard (such as playing cards or index cards) to push mercury droplets together and to scoop up beads of mercury; a flashlight will reflect off of shiny mercury beads and make them easier to see.
-  **5.** Use the sticky side of duct or masking tape to pick up any remaining mercury beads.
- 6.** Place the mercury-contaminated cleanup materials (cardboard, gloves, tape, etc.) into double plastic bags or preferably a glass or rigid container with a lid for containment. In the meantime, store the bag or container (label and separate from your regular trash) - outside the house in an area inaccessible to children. Contact your local solid waste district, alliance or municipality for proper disposal of spill cleanup debris. See www.mercvt.org “proper disposal” or call toll free **-855-63-CYCLE** or **(802) 522-5736**.
- 7.** Wash your hands or shower if you came in contact with the mercury.
- 8.** For health questions, call **-800-439-8550** (toll-free in VT) and dial zero to speak with an operator. During non- work hours, contact the Northern New England Poison Center at **-800-222-1222**
- 9.** Once cleaned up, weather permitting, leave windows in the contaminated room open as long as practical.



NEVER

-  Ignore or sweep up the spill.
-  Use a vacuum to clean up the spill.
-  Pour mercury down the sink.
-  Wash mercury-containing items in a washing machine.
-  Throw mercury in the trash.

Fluorescent & HID Mercury Containing Lamps

What are the concerns about mercury?

Mercury is a highly toxic heavy metal that is released into the environment when mercury-containing lamps are broken or discarded. Although lamps contain a relatively small amount of mercury, the high volume of spent lamps generated in Vermont each year contributes to mercury contamination, particularly in fish and wildlife. State and federal fish advisories restrict consumption of certain freshwater and marine fish (see: www.mercvt.org).

What kinds of lamps contain mercury?

Fluorescent lamps (linear and compact fluorescent) and high intensity discharge (HID) lamps contain mercury. HID is a term used to describe mercury vapor, metal halide, and high pressure sodium lamps.

How are mercury-containing lamps regulated?

Spent lamps, whether generated by businesses or households, cannot by law be disposed in the trash, and if possible, should be recycled. Spent lamps generated by businesses and institutions are subject to Universal Waste Management Standards contained in the Vermont Hazardous Waste Management Regulations (VHWMR) ([Subchapter 9](#)). See the fact sheet on [Universal Waste](#) for more information.

What are the options for recycling mercury-containing lamps?

The following recycling options are available to homeowners and businesses:

- Contact your local solid waste district or municipality for information about the availability of nearby collection sites or household hazardous waste collection events. Many hardware stores and other retailers offer free collection programs for smaller quantities of lamps from households and small businesses.
- Some electrical wholesale suppliers accept lamps from their customers for recycling.
- Businesses that already use a permitted hazardous waste transporter to pick up hazardous wastes may be able to ship spent lamps using that same transporter.
- Check www.mercvt.org or call 1-855-632-9253 for more recycling information.

Are there special storage requirements for businesses or solid waste facilities?

Yes. Under the Universal Waste Management Standards, you are required to immediately package lamps in structurally sound containers (boxes) that prevent breakage. Lamps are landfill banned, so they cannot be disposed with trash. Boxes or containers must be:

- Sized for the bulbs;
- Kept closed and sealed with tape once full (Do not tape lamps together);
- Labeled "Used Lamps", "Universal Waste Lamps" or "Waste Lamps;"
- Stacked no higher than five feet;
- Stored on site for no more than one year. Dating the box when you start a new one is the easiest way to show compliance; and
- You may self-transport mercury-containing lamps to a Universal Waste Handler without a manifest.

Note: Improper handling or labeling of Universal Waste Lamps are now subject to environmental citations (see 10 V.S.A. § 8019), with fines of \$150-\$1500.

Environmental Fact Sheet: Fluorescent & HID Mercury Containing Lamps

Can the so-called “green tip” or low mercury lamps be disposed in the trash?

No. Even though some manufacturers make lamps that are low in mercury, these lamps are also prohibited from disposal as solid waste in Vermont.

Is crushing an acceptable method of managing spent lamps?

No. Vermont regulations prohibit the intentional breaking or crushing of mercury-containing lamps since studies have shown that even enclosed crushing devices designed specifically for lamps release a significant amount of mercury vapor. Although lamp crushing devices are commercially available for the purpose of increasing lamp storage space (decreasing lamp volume), the use of such devices is prohibited without full certification under the VHWMR. Lamps that are intentionally broken must be managed as hazardous waste.

What if a lamp accidentally breaks?

If a lamp breaks during routine handling, collect the residue (see below for safe clean-up instructions) into a container and evaluate the residue to determine if it is subject to regulation as hazardous waste under the VHWMR. If the residue exhibits the toxicity characteristic for mercury (see [VHWMR section 7-208](#)), it must be managed on-site and disposed of as hazardous waste according to applicable VHWMR requirements.

If a lamp is broken after being placed in a shipping container (e.g., box, drum, etc), the lamp should be left in the shipping container, and the container should be sealed immediately. The sealed container may still be managed as Universal Waste.

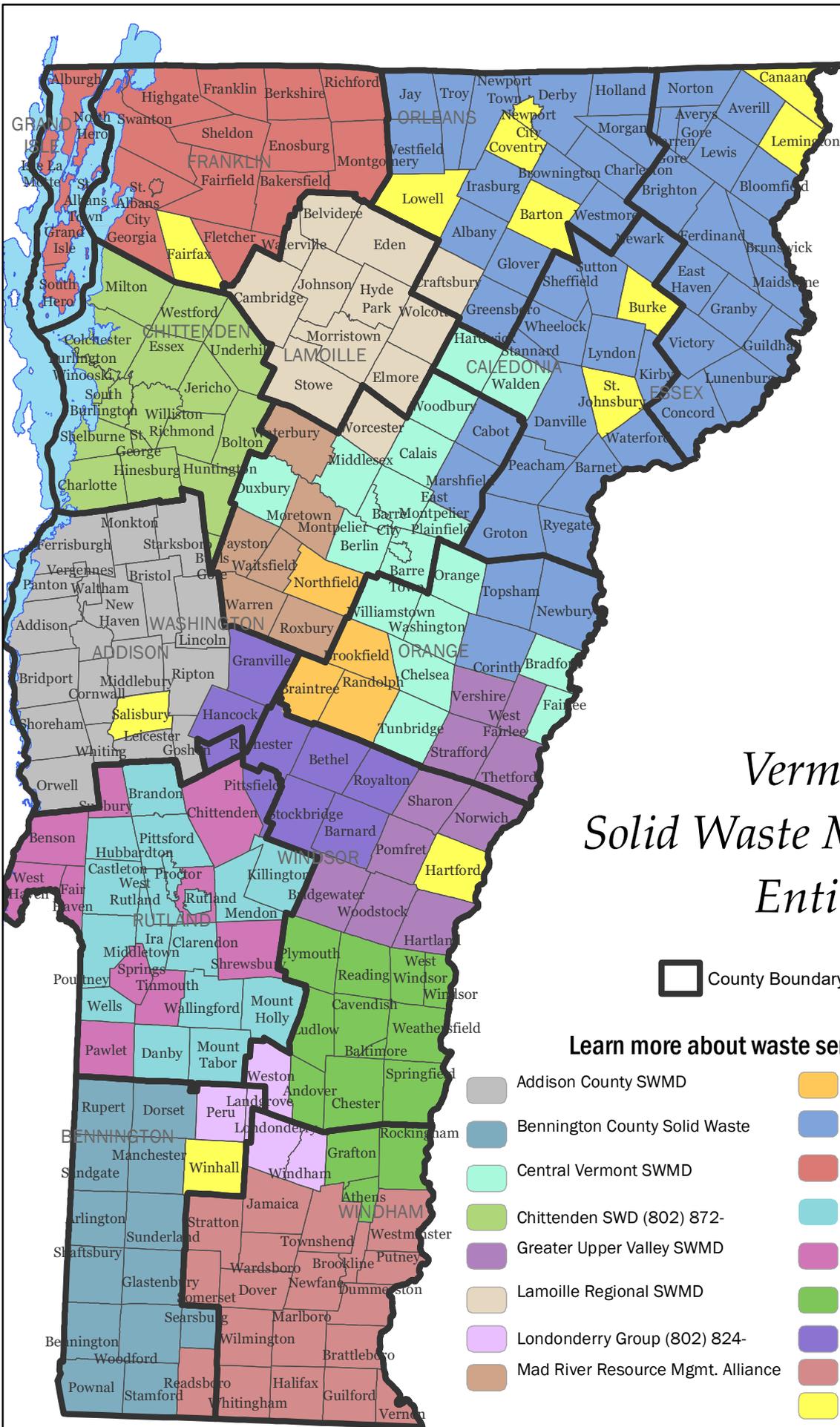
You can safely clean up a broken lamp by following the directions below:

- ✓ **DO NOT VACUUM OR SWEEP** – up the broken lamp, as this may spread any mercury vapor that is present to other rooms. Keep all people and pets away from the breakage area.
- ✓ Ventilate the room by closing all interior doors and vents, opening windows and any exterior doors in the room and leaving the room (restrict access) for at least 15 minutes.
- ✓ Remove all materials you can, and don't use a vacuum cleaner.
 - Wear disposable gloves if available
 - Carefully scoop up the glass fragments and powder with a stiff paper or cardboard (such as playing cards or index cards)
 - Pick up any remaining small pieces of glass and powder using sticky tape (such as masking or duct tape)
 - Wipe the area clean with a damp paper towel or disposable wet wipe
- ✓ Place all cleanup materials (cardboard, gloves, tape, etc.) into a glass or rigid container with a lid.
- ✓ Wash your hands.
- ✓ Leave windows in the affected room open as long as practical (weather permitting).

If the residue is determined to be hazardous waste, it must be disposed properly in accordance with the VHWMR.

For more information contact:

Vermont Department of Environmental Conservation
Waste Management and Prevention Division
1 National Life Drive, Davis 1
Montpelier, VT 05620-3704
(802) 828-1138



February 13, 2018



Vermont Solid Waste Management Entities

County Boundary

Learn more about waste services in your area:

- | | |
|-----------------------------------|----------------------------------|
| Addison County SWMD | Mountain Alliance (802) 728- |
| Bennington County Solid Waste | Northeast Kingdom SWMD |
| Central Vermont SWMD | Northwest Vermont SWMD |
| Chittenden SWD (802) 872- | Rutland County SWD |
| Greater Upper Valley SWMD | Solid Waste Alliance Communities |
| Lamoille Regional SWMD | Southern Windsor/Windham |
| Londonderry Group (802) 824- | White River Alliance (802) 234- |
| Mad River Resource Mgmt. Alliance | Windham SWMD (802) 257- |
| Individual town with approved | |