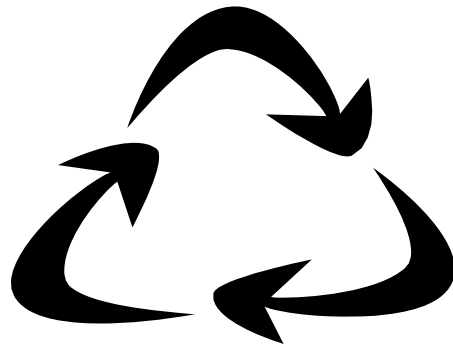


# Training Module (1-hour version) for Generators and Handlers Of Fluorescent and Mercury-Containing Lamps (and Ballasts)

(Training required by the Universal Waste Rule)



Prepared by:

## The Lamp Recycling Outreach Project

This project made possible through a cooperative agreement between the Association of Lighting and Mercury Recyclers and the United States Environmental Protection Agency for the Lamp Recycling Outreach Project



Funding provided by the USEPA

Lamp Recycling Outreach Project Participants:



Association of Lighting and  
Mercury Recyclers



National Electronic Manufacturers Association



**SWANA**<sup>®</sup>  
SOLID WASTE ASSOCIATION  
of North America

The Solid Waste Association of  
North America

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**“Lamp Recycling. The Responsible Thing To Do<sup>®</sup>”** is the slogan for the **Mercury Lamp Recycling Outreach Project**, a national outreach and education campaign that was started in 2003 with funding from the U. S. Environmental Protection Agency.

## “Lamp Recycling. The Responsible Thing To Do©”

This training module is offered as one of the deliverables for the **Lamp Recycling Outreach Project**, a cooperative agreement between the Association of Lighting and Mercury Recyclers and the USEPA.

### Requirement for training

In accordance with the Universal Waste Rule (40 CFR 273) there are training requirements for generators, small quantity handlers of universal waste (§273.16), and for large quantity handlers of universal waste (§273.36). These code sections state:

*§273.16 “A small quantity handler of universal waste must inform all employees who handle or have responsibility for managing universal waste. The information must describe proper handling and emergency procedures appropriate to the type(s) of universal waste handled at the facility”*

*§273.36 “A large quantity handler of universal waste must ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures, relative to their responsibilities during normal facility operations and emergencies.”*

This training module is intended to assist lamp generators and handlers with meeting regulatory requirements that pertain to **employee training for mercury lamp management**. As a courtesy, we have also included:

- 1) information on PCB and Non-PCB ballasts, because they often are associated with lamps. Ballasts are not Universal Wastes, but are considered hazardous in some states, and
- 2) samples of labels and workplace signage, also required under the UWR for the management of mercury lamps, and sample labels for ballasts. These are suitable for reproduction for the workplace.

This module includes the proper handling and emergency procedures for spent lamps that contain mercury. Any hazardous mercury lamp generator who is not exempt from the regulations (check with each state) must be able to **document that employees are trained** in accordance with these minimum requirements.

It is estimated that it will take less than one hour to present this module to employees.

## Context for the training

### Federal Register July 6, 1999 - Vol. 64, No. 128, pp. 36466-36490- Universal Waste Rule (UWR)- inclusion of mercury lamps:

- Requires full regulatory compliance for hazardous waste if Universal Waste management options are not chosen.
- Small and large quantity handlers of universal waste lamps are prohibited from diluting or treating universal waste lamps except by responding to releases. The prohibition against treatment includes a prohibition against crushing. The uncontrolled crushing of universal waste lamps in containers meeting only the general performance standards of the universal waste rule would not sufficiently protect human health and the environment.
- Imposes minimal training and labeling requirements on generators and handlers.

### The Universal Waste Rule DOES NOT relieve generators of superfund liability

## Are you the generator or handler?

**Generator** - Any person, by site, whose act or process produces hazardous waste identified or listed in 40 CFR 261, or whose act first causes a hazardous waste to become subject to regulation. The generator definition can be found at 40 CFR 260.10 ([http://a257.g.akamaitech.net/7/257/2422/20cot20031500/edocket.access.gpo.gov/cfr\\_2003/julqtr/40cfr260.10.htm](http://a257.g.akamaitech.net/7/257/2422/20cot20031500/edocket.access.gpo.gov/cfr_2003/julqtr/40cfr260.10.htm)). A lamp generator can be considered a Small Quantity Handler of Universal Waste (SQHUW) or a Large Quantity Handler of Universal Waste (LQHUW) depending on how many spent lamps are accumulated at one time. Standards applicable to RCRA generators are found at 40 CFR 262. Universal waste handler requirements are found at 40 CFR 273 Subparts B and C.

## Information for Employees

### 1. Proper Handling Procedures for Mercury Lamps

#### **PURPOSE:**

To ensure that an employee's exposure to mercury is minimized and that materials containing mercury are handled and disposed of in an environmentally sound manner.

#### **BACKGROUND:**

All fluorescent lamps and most other types of energy-efficient lighting contain elemental mercury. Mercury has a unique combination of properties that make it the most efficient material for use in fluorescent and

HID lamps. The basic operating principles of fluorescent lamps depend on production of ultraviolet (UV) light and mercury is the most efficient product of the required UV. Safeguarding used lamps from breaking will minimize releases of mercury into the environment. Normal handling is a very low risk activity.

**CAUTION:**

Mercury released from broken lamps and mercury contaminated materials vaporize at room temperature. Mercury vapor is extremely toxic. Mercury is the only heavy metal that is liquid at room temperature. Because of this and other useful properties its usage is commonplace. It can be more harmful to inhale the vapor from a bead of mercury than to ingest the same bead. At room temperature mercury vaporizes readily into an invisible, odorless, and tasteless and potentially harmful element.

Ambient mercury levels in the breathing zone can be controlled if personnel are aware of and trained in mercury management. Be conscious of the hazard of unseen mercury contamination in cracks, corners and untreated storage containers.

**HANDLING PROCEDURES:**

Procedure for handling unbroken fluorescent lamps for packaging. Employee should wear the following safety equipment.

1. Gloves made of leather, or equivalent
2. Safety glasses with side shields or full face shield
3. Safety toed shoes or boots

**STEP 1:**

Place used lamps into new or used lamp boxes (the original egg crate material does not have to be placed back into the boxes) and tape the ends to secure the box, but do not make it hermetically sealed (air tight). There are other suitable containers available commercially or from recyclers.

- \*Broken or crushed lamps should be packaged in an approved container (e.g. 55 gallon drum) or bagged into smaller containers.
- \*Badly damaged boxes, wet boxes, etc. may not be accepted for transport.
- \*Boxes should be kept in a secure, dry area.
- \*For larger quantities, cross-stack and palletize lamp boxes to a maximum height of 6 feet. Secure boxes to pallet with shrink wrap or stretch film.
- \*All pallets need to be labeled as **Used Mercury Lamps** or **Universal Waste Mercury Lamps** (see sample label below).

**STEP 2:**

All employees who handle Universal Wastes shall wash hands with soap and water when beginning a work shift, before a break, and upon completion of the work shift. No tobacco materials, food, or beverages are permitted while working with mercury lamps.

**STEP 3:**

It is the employee's responsibility to ensure that these handling and disposal procedures are fully carried out. The proper use of the prescribed safety equipment will protect the employee from the potential dangers of contamination from mercury.

**STEP 4:**

Storage time is maximum 1 year from the first date of accumulation. Schedule removal (and recycling) by contacting \_\_\_\_\_.

- \* Minimum information required to schedule a pickup.
  - Contact person
  - Date of pickup
  - Physical address of location
  - Material location: i.e., loading dock, storage container.

## 2. Emergency Procedures- Breakage

**PURPOSE:** To ensure that accidental breakage is cleaned up without spreading the mercury and with minimum exposure to employees.

**BACKGROUND:** Lamps are fragile and they can easily break. The regulations distinguish between accidental breakage that occurs during normal transport and intentional breakage or crushing. While there is no specific amount of breakage that is considered accidental, less than 5% is typical. Anyone who chooses to recycle lamps under the UWR should take standard precautions to minimize breakage, such as using the boxes from new lamps to store old ones in. More specific guidance on this is available from recyclers.

**CAUTION:** EPA provides the following breakage advisory for **THE HANDLING OF SMALL NUMBERS OF BROKEN FLUORESCENT LAMPS:**

1. If a lamp breaks in your home or workplace, close off the room to other parts of the building.
2. Open a window to disperse any vapor that may escape, and leave the room for at least 15 minutes.
3. Carefully scoop up the fragments with a stiff paper or a broom and dustpan (do not use your hands) and wipe the area with a disposable paper towel to remove all glass fragments.
4. **Do not use a vacuum,** as this disperses the mercury over a wider area.
5. All fragments should be placed in a sealed plastic bag and properly disposed of. Under the Universal Waste Rule, a hazardous lamp that is broken must be cleaned up and placed in a container. The container must be closed, structurally sound, compatible with lamps, and lacking any evidence of spillage.

6. For larger quantities of lamps broken at the same time (for example, a box of lamps falling from a lift truck) the use of Personal Protective Equipment may be required and we suggest contacting a hazardous waste cleanup contractor.

In some states, universal waste status is lost when lamps are broken and they must be handled as a full RCRA hazardous waste. It is important to check with your local, state, or federal office for the latest update in regulatory status or go to [www.lamprecycle.org](http://www.lamprecycle.org), or [www.almr.org](http://www.almr.org).

Health Effects: No adverse effects are expected from occasional exposure to broken lamps.



# Sample Labels for containers or pallets

The requirements for labeling used lamps (for generators and small quantity handlers of universal waste (§273.14), and for large quantity handlers of universal waste (§273.34) can be met by using a label similar to these samples, either on each container, or on a pallet of containers.

Universal Waste  
Mercury Containing Lamps  
for Recycling by

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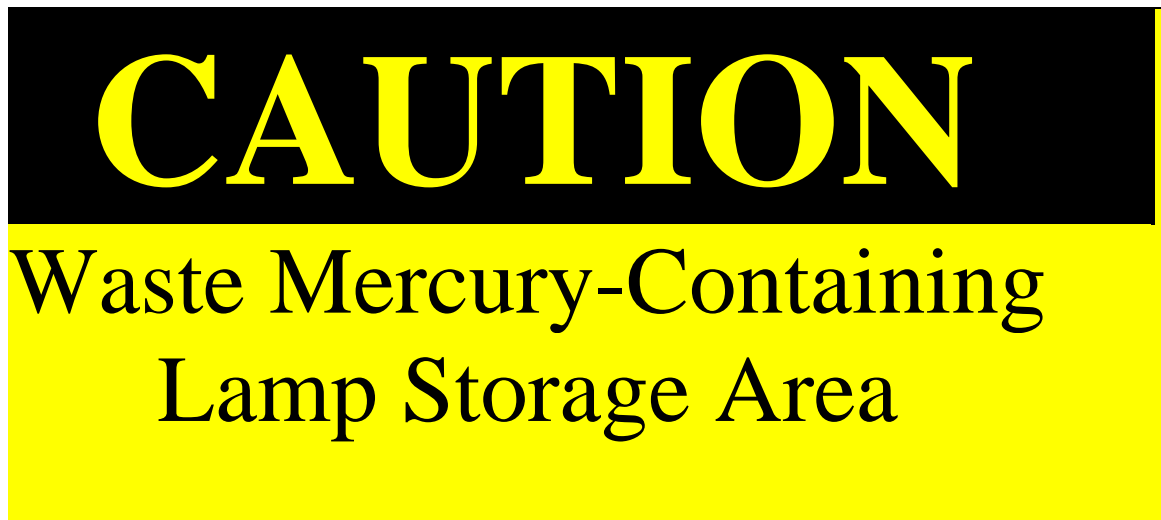
*Or*

**Universal Waste- Lamps**

Accumulation Start Date: \_\_\_\_\_

• *Alternate phrases, “Waste Lamps” or “Used Lamps” are acceptable*

**Sample signage for the workplace  
storage area**



The information below represents ALMR's interpretation of the Universal Waste Rule - environmental / legal professionals should be consulted for additional interpretations.

<p><b><i>Management of Used Fluorescent, High Intensity Discharge and Miscellaneous Lamps as Universal Wastes</i></b></p>
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***Universal Waste  
Basic Principles:***

- ◆ ***Eases Handling and Disposal Regulations***
- ◆ ***Reduces Cost to Properly Manage & Recycle***

The US EPA has added lamps that exhibit a hazardous characteristic, including mercury to the federal list of universal wastes regulated under the Resource Conservation and Recovery Act (RCRA) of 1990. ***This reduces the cost and regulatory burden on generators who recycle due to streamlined regulations regarding accumulation, storage, transport, treatment & disposal.***

Until July 6, 1999, federal and some state regulations made it difficult and expensive for generators to properly manage over 670 million lamps discarded each year as hazardous waste. Most ended up in municipal landfills which posed dangers for the public health and environment due to mercury and lead contamination of air and groundwater. Most states had already adopted policies to prohibit lamp disposal in municipal landfills and were granting handling exemptions to generators who recycle lamps.

***Federal Register  
July 6, 1999 - Vol. 64  
No. 128  
pp 36466-36490***

- ◆ Requires full regulatory compliance for hazardous waste if management as Universal Waste including recycling is not chosen.
- ◆ Optional for Households and Conditionally Exempt Small Quantity Generators (less than 100 kg/mo.). May manage lamps as Universal Waste or via RCRA exemption.
- ◆ Exempts whole lamps from shipment on Hazardous Waste Manifest and allows shipment using a Common Carrier Bill of Lading if lamps are destined for recycling.
- ◆ Does not require the analytical testing or reporting of whole lamps destined for recycling.
- ◆ Adds hazardous waste lamps to the federal universal waste rule (waste lamps that are hazardous due to exhibiting one or more of the characteristics of hazardous waste) which includes incandescent and neon lamps.
- ◆ Small and large quantity handlers of universal waste lamps are prohibited from diluting or treating universal waste lamps except by responding to releases. The prohibition against treatment includes a prohibition against crushing. EPA feels that uncontrolled crushing of universal waste lamps in containers meeting only the general performance standards of the universal waste rule would not sufficiently protect human health and the environment.
- ◆ Reduces record keeping, training and emergency requirements.
- ◆ Most businesses won't have to register with the EPA to obtain a generator ID or do reporting.
- ◆ Imposes minimal training and labeling requirements on generators and handlers.

***Generator***

- Any person, by site, whose act or process produces hazardous waste identified or listed in 40 CFR 261, or whose act first causes a hazardous waste to become subject to regulation. The generator definition can be found at 40 CFR 260.10 ([http://a257.g.akamaitech.net/7/257/2422/20cot20031500/edocket.access.gpo.gov/cfr\\_2003/julqtr/40cfr260.10.htm](http://a257.g.akamaitech.net/7/257/2422/20cot20031500/edocket.access.gpo.gov/cfr_2003/julqtr/40cfr260.10.htm)). A lamp generator can be considered a Small Quantity Handler of Universal Waste (SQHUW) or a Large Quantity Handler of Universal Waste (LQHUW) depending on how many spent lamps are produced in a year and whether they are accumulated. Standards applicable to RCRA generators are found at 40 CFR 262. Universal waste handler requirements are found at 40 CFR 273 Subparts B and C.

***Small Quantity  
Handler (SQHUW)***

- A universal waste handler (a generator or third party) who accumulates less than 5,000 kg (11,000 lb) total of universal waste (batteries, pesticides, thermostats, or lamps calculated collectively) at any time. No EPA ID is required. Storage time for the waste is up to one year. Employees are required to have minimal training and information on handling and emergency procedures. Proper marking and labeling of universal waste is required. SQHUW requirements are found at 40 CFR 273 Subpart B.

<b><i>Large Quantity Handler (LQHUW)</i></b>	<ul style="list-style-type: none"> <li>◆ A universal waste handler (a generator or third party) who accumulates 5,000 kg (11,000 lb) or more total of universal waste (batteries, pesticides, thermostats, or lamps calculated collectively) at any time. This designation as a LQHUW is retained through the end of the calendar year in which 5,000 kg or more total of universal waste is accumulated. The definition for LQHUW can be found at 40 CFR 273.9 (<a href="http://a257.g.akamaitech.net/7/257/2422/20cot20031500/edocket.access.gpo.gov/cfr_2003/julqtr/40cfr273.9.htm">http://a257.g.akamaitech.net/7/257/2422/20cot20031500/edocket.access.gpo.gov/cfr_2003/julqtr/40cfr273.9.htm</a>). An EPA ID is required, and state registration may also be required. Employees are required to have training and information on proper handling and emergency procedures. Proper marking and labeling of universal waste is required. LQHUW requirements are found at 40 CFR 273 Subpart C.</li> </ul>
<b><i>Universal Waste Transporter</i></b>	<ul style="list-style-type: none"> <li>◆ One who engages in the process of transporting waste lamps for 10 days or less. A transporter may not store, accumulate, dispose, dilute or treat universal waste lamps. No EPA ID is required. Proper marking and labeling of waste lamps is required. Transporter requirements are found at 40 CFR 273 Subpart D.</li> </ul>
<b><i>UW Transfer Facility</i></b>	<ul style="list-style-type: none"> <li>◆ Any transportation-related facility including loading docks, parking areas, storage areas and other similar areas where shipments of universal waste are held during the normal course of transportation for ten days or less. The definition for a Universal Waste transfer facility is found at 40 CFR 273.9 and requirements are found at 40 CFR 273.53 (<a href="http://a257.g.akamaitech.net/7/257/2422/08aug20031600/edocket.access.gpo.gov/cfr_2003/julqtr/40cfr273.53.htm">http://a257.g.akamaitech.net/7/257/2422/08aug20031600/edocket.access.gpo.gov/cfr_2003/julqtr/40cfr273.53.htm</a>)</li> </ul>
<b><i>Destination Facility</i></b>	<ul style="list-style-type: none"> <li>◆ A state or federally authorized/permitted treatment, recycling or disposal facility. A destination facility is subject to requirements similar to a "Treatment, Storage, and Disposal Facility (TSDF)," permitting requirements, the Land Disposal Restrictions (LDR), and other provisions under Subtitle C (40 CFR 273 Subpart E).</li> </ul>

# ***HANDLING AND DISPOSAL OF PCB AND NON PCB BALLASTS***

## **PURPOSE:**

To ensure that employee's exposure to PCBs is minimized and that material containing PCBs are handled and disposed of in an environmentally sound manner.

## **BACKGROUND:**

Polychlorinated bi-phenyls (PCBs) were used in the capacitors of fluorescent lamp ballasts and in the capacitors of high intensity discharge (HID) lighting fixtures. PCBs were also found in other electrical equipment including common household appliances. PCBs were used in these items as they were an excellent insulator and they would not burn.

In 1978, the United States Environmental Protection Agency (EPA) banned the use of PCBs as they were found to pose a health risk to humans. Mineral oils and powdered materials replaced PCBs in lamp and ballast and capacitors manufactured after 1978 and these items generally bear a label reading "No PCBs".

The majority of ballasts and capacitors you will come into contact with in your day to day job activities pose no health risk. However, there are still ballasts and/or capacitors in service that contain very small amounts of PCB fluid. For handling these ballasts and capacitors, follow the handling and disposal procedures outlined below.

## **HANDLING PROCEDURES:**

Procedure for removal of 'non leaking' PCB capacitors from fluorescent lamp ballasts. Employee should wear the following safety equipment.

1. Gloves made of chemical resistant neoprene coated, butyl rubber, or leather.
2. Safety glasses with side shields or full face shield.
3. Safety toed shoes or boots.

**STEP 1:**

Once removed from the fixture, the Toxic Substance Control Act (TSCA) requires that PCB ballasts be stored in approved DOT drums. The drums should be stored inside the building.

Outside storage is permitted if they are on an impervious surface, the drum lids are secured, and they are protected against weather and vandalism.

**STEP 2:**

Separate ballast by type (PCB, non PCB) and visually check for leakers, and place into drums.

NOTE: Leaking PCB ballasts must be double bagged and placed in a drum containing at least 3 inches of vermiculite.

**STEP 3:**

Properly label drums PCB or Non PCB. See sample labels below. Secure drum lid.

All protective equipment that comes into contact with any material leaking from a capacitor will be placed in proper containers for disposal. Employees shall wash hands with soap and water when beginning a work shift, before a break, and upon completion of the work shift. No tobacco materials, food, or beverages are permitted while working with lamp ballasts.

It is the employee's responsibility to ensure that these handling and disposal procedures are fully carried out. The proper use of the prescribed safety equipment will protect the employee from the potential dangers of contamination from PCBs.

**STEP 4:**

Storage time is maximum 30 days from the first date of accumulation. Longer periods may subject you to permitting and other compliance requirements. You are encouraged to contact your state agency or regional federal EPA office for any pre-notification, storage or other requirements that may apply. Then, schedule removal (and recycling) by contacting \_\_\_\_\_.

**CAUTION  
CONTAINS  
PCBs**  
(Polychlorinated Biphenyls)

A toxic environment contaminant requiring special handling and disposal in accordance with U.S. Environmental Protection Agency Regulations 40 CFR 761. For Disposal Information contact the nearest U.S. E.P.A. Office.

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In case of accident or spill, call toll free the U.S. Coast Guard National Response Center:  
**800-424-8802**

Also Contact E.P.S.I.

Tel. No. 800-414-0443

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**HAZARDOUS  
WASTE**

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL  
IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY  
AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY.

ACCUMULATION START DATE \_\_\_\_\_ E.P.A. WASTE NO. NON RCRA

D.O.T. PROPER SHIPPING NAME RD, ENVIRONMENTALLY HAZARDOUS

AND SUBSTANCE, SOLID, N.O.S., 9, UN3077

U.N. OR N.A. NO. DG III, (POLYCHLORINATED BIPHENYLS)

GENERATOR NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

E.P.A. I.D. NO. \_\_\_\_\_ MANIFEST DOCUMENT NO. \_\_\_\_\_

**HAZARDOUS WASTE  
HANDLE WITH CARE**

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## *Management of Fluorescent Light Ballasts*

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### *Lighting Ballasts*

#### **Fluorescent Lighting Ballasts are Regulated - Do Not Throw In The Trash.**

- ◆ In the Preamble to the 1982 PCB regulations the U.S. EPA authorized the disposal of fluorescent light ballasts in a municipal landfill under the disposal exemption granted in 40 CFR 761.60. However, the **PCB Mega-Rule** which was promulgated on June 29, 1998, and became effective on August 28, 1998, has changed that exemption.
  - ◆ According to data submitted in the TSCA Section 21 petition, ballasts manufactured prior to July 1978, have a better than 50% chance of containing PCBs at 50 ppm or greater in their potting material. (Federal Register Vol. No. 124 page 35404.) U.S. EPA is asking that anyone who seeks to dispose of fluorescent light ballasts in a municipal landfill to “assume that the potting material contains PCBs at 50 ppm or greater and dispose of them as PCB waste.”
-