



Management of Universal Waste

Technical Guidance

This technical guidance document describes some of the basic requirements for handlers of universal waste (UW). Universal waste is a subset of hazardous waste and contains mercury, lead, cadmium, copper and other substances hazardous to human and environmental health. Universal wastes are generated from a wide variety of sources (i.e., individuals, government agencies, hospitals, businesses, etc.) in a variety of settings, not just in traditional industrial settings. These wastes are referred to as *universal* because, at some point, almost every business, non-profit organization, and government agency generates them.

Goals of the Universal Waste Regulations

The universal waste regulations were developed with several interrelated goals in mind:

- To encourage the recycling of the categories of wastes designated as universal waste.
- To improve the management of certain types of hazardous wastes.
- To reduce the amount of hazardous waste that ends up in solid waste landfills and combustors.
- To ease the regulatory burden on the facilities that manage these wastes, particularly by allowing more time for accumulation of these wastes in order to facilitate appropriate recycling or disposal.
- To ensure that these wastes go to appropriate treatment or recycling facilities.

Categories of Universal Waste

Certain widely-generated hazardous wastes have been designated as universal waste. Managing qualifying hazardous wastes as universal waste is optional. Generators have the choice to manage hazardous wastes that fit into the categories of universal waste under the streamlined requirements of [40 CFR 273](#) instead of the more stringent RCRA Subtitle C requirements for hazardous waste. UW includes:

- **Hazardous waste batteries** – devices consisting of one or more electrically connected electrochemical cells designed to receive, store and deliver electric energy. Includes nickel cadmium batteries and lead acid batteries.

- **Certain hazardous waste pesticides** – substances that are intended for preventing or mitigating pests or intended for use as a plant regulator or defoliant. Excludes animal drugs and animal feed containing animal drugs.
- **Mercury-containing equipment** – devices that contain elemental mercury integral to their function. Includes thermostats, but does not include batteries or lamps.
- **Hazardous waste lamps** - bulbs or the tube portion of electric lighting devices that are specifically designed to produce radiant energy. Includes mercury vapor lamps, fluorescent light bulbs, and neon lights.

The applicability of the universal waste requirements to each category of waste described above can be found in [40 CFR Part 273 Subpart A](#).

Universal wastes that are mixed with hazardous wastes are fully regulated as hazardous wastes. Mixtures of universal waste and conditionally exempt small quantity generator waste or household hazardous waste can be managed under the universal waste requirements since these hazardous waste are not subject to full hazardous waste regulation.

Wastes that are not Universal Wastes

- **Non-hazardous batteries:** Batteries that are not hazardous at the time of disposal need not be managed as UW. Non-hazardous batteries include alkaline, carbon zinc, chloride zinc (commonly labeled *heavy duty*), nickel metal hydride (NiMH), zinc air, and lithium batteries

that are nine volts or less and higher voltage lithium batteries that have been discharged to less than one volt. Although non-hazardous, you are still encouraged to recycle them.

- **Electronic waste:** Circuit boards and cathode ray tubes (CRTs).
- **PCB-containing ballasts and small capacitors:** Lighting ballasts and small capacitors that may contain PCBs that are found in motors and appliances.

Advantages of Managing Hazardous Wastes as UW

- Universal waste volume is not included when determining hazardous waste generator status. This may benefit some companies by allowing them to reduce their generator status level which in turn would reduce their generator regulatory requirements.
- Universal waste can be accumulated for up to one year which is a longer accumulation time than allowed for small quantity and large quantity generators of hazardous waste.
- Less labeling is required on universal waste.
- A hazardous waste manifest is not required to accompany a universal waste shipment in Arizona or within any other state that recognizes it as universal waste.
- Less recordkeeping is required.
- A shipment of universal waste can be transported via a universal waste transporter rather than a hazardous waste transporter.

Universal Waste Handler Requirements

The universal waste regulations create two groups of generators of universal waste, called handlers, based on the amount of universal waste accumulated on-site. Universal waste handlers are not just those that generate or produce universal waste, but also those who receive universal waste from other handlers. Below is a description of the two universal waste handler groups – Small Quantity Handlers of Universal Waste and Large Quantity Handlers of Universal Waste and the main requirements each must comply with. A full description of handler requirements can be found in [40 CFR Part 273 Subpart B](#) and [Subpart C](#).

Small Quantity Handlers of Universal Waste - accumulate less than 5,000 kilograms (or about 11,000 pounds) of universal waste at any one time on-site. SQHUWs must comply with the following:

- Label or mark universal waste to identify the type of universal waste it is (See [40 CFR 273.14](#)).
- Manage universal waste in a way that prevents releases to the environment.
- Immediately respond to releases of universal waste and properly manage released waste.
- Distribute basic waste handling and emergency information to their employees to ensure that their staff is aware of these procedures.
- Accumulate universal waste for no more than one year.
- Comply with export requirements for foreign shipments.

SQHUWs are not required to notify PDEQ of their universal waste management activities, not required to keep records of universal waste shipments, and not required to use a hazardous waste manifest for off-site shipments of universal waste. However, PDEQ recommends keeping records of universal waste management as a best management practice (BMP). Handlers must comply with U.S. DOT hazardous materials requirements, if applicable.

Large Quantity Handlers of Universal Waste -

accumulate on-site 5,000 kilograms or more of universal waste at any one time. The designation as a LQHUUW is retained for the remainder of the calendar year in which the 5,000-kg threshold was exceeded, and may be reevaluated in the following calendar year. Handlers must comply with the following:

- Label or mark universal waste to identify the type of universal waste (See [40 CFR 273.34](#)).
- Manage universal waste in a way that prevents releases to the environment.
- Immediately respond to releases of universal waste and properly managed released waste.

- Ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures relative to their responsibilities during normal facility operations and emergencies.
- Accumulate universal waste for no more than one year.
- Comply with export requirements for foreign shipments.
- Notify PDEQ and obtain an EPA identification number from ADEQ if they do not already have one.
- Maintain records of all universal waste shipments received by and sent from the facility and retain these records for three years.

Handlers are not required to use a hazardous waste manifest for off-site shipments of universal waste, but must comply with U.S. DOT hazardous materials requirements, if applicable.

Waste Specific Management Requirements

Each type of universal waste has specific management requirements designed to prevent releases to the environment that handlers must comply with. These standards can be found in [40 CFR Section 273.13](#) for SQHUWs and [Section 273.33](#) for LQHUWs. Additionally, these sections discuss those activities that universal waste handlers can perform under the universal waste regulations such as ampule removal from mercury containing equipment and mixing or discharging batteries and what standards they have to follow in order to do them.

Attachment: ADEQ Fact Sheet “Managing Universal Waste Lamps for Business”

For additional information regarding proper management of solid or hazardous waste in Pima County, you may contact the Pima County Department of Environmental Quality (PDEQ) at (520) 724-7400, or the address at the beginning of this document, or visit the PDEQ website at <http://www.deq.pima.gov/waste/index.html> for access to the PDEQ Hazardous Waste Generators Handbook and waste or generator specific, technical guidance documents.

Managing Universal Waste Lamps for Businesses – March 2014

Background:

The U.S. Environmental Protection Agency (EPA) finalized the Universal Waste Rule (40 CFR Part 273) on May 11, 1995, to provide a streamlined approach for businesses to collect and manage certain widely generated hazardous wastes. The rule was intended to facilitate environmentally sound collection and encourage proper recycling and treatment of these wastes.

This fact sheet summarizes universal waste regulations for lamps, EPA's recommendations for management of fluorescent lamps, and ADEQ's adoption of the Universal Waste Rule for lamps.

What is a universal waste lamp?

A lamp is the bulb or tube portion of an electric lighting device that is designed to produce radiant energy. It includes, but is not limited to, fluorescent tubular and compact fluorescent lamps (CFLs); high intensity discharge; neon; mercury vapor; high pressure sodium; and metal halide lamps.

EPA encourages the use of fluorescent lamps because they use about 20 percent to 25 percent less electricity, which in turn reduces mercury and greenhouse gas emissions from power generating stations.

The amount of mercury in a standard fluorescent lamp varies depending on the type and manufacturer of the lamp, but typically ranges from 8 milligrams – 14 mg, and can possibly be as high as 50 mg with some older lamps. The amount of mercury in a low-mercury bulb (often referred to as "green-tipped" lamps) can typically range from 3.5 – 4 mg depending on the manufacturer. Newer fluorescent lamps in general will typically have less mercury, but mercury is an essential



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component in fluorescent lamps and cannot be eliminated completely.

An unused mercury-containing lamp becomes a waste on the date the handler decides to discard it.

Who is affected by this rule?

Businesses

Businesses that generate less than 100 kilograms of hazardous waste in one calendar month [Conditionally Exempt Small Quantity Generators (CESQG)] are strongly encouraged to participate in voluntary collection and recycling programs by taking these spent lamps to collection centers for recycling or proper treatment and disposal.

Under federal regulations, the Toxicity Characteristic Leaching Procedure (TCLP) determines if a lamp is a hazardous waste. This test measures the leachability of certain metals, including mercury and organic constituents. Lamps that pass the TCLP test for mercury are not hazardous and not subject to federal regulation. The amount of mercury in a fluorescent lamp

typically exceeds and fails the TCLP limit. Therefore, the lamp is a hazardous waste when disposed.

Small and large quantity hazardous waste generators are required to manage spent lamps under 40 CFR Part 273 or under 40 CFR Part 261.

Households

Households that generate spent lamps are not regulated as hazardous waste. Households are encouraged to recycle spent lamps at local retailers or collection centers that accept spent lamps (see back page).

"Green-Tipped" fluorescent lamps

Green-tipped lamps usually will not fail the TCLP limit for mercury and can be managed as a solid waste. Check the manufacturer literature to confirm that these lamps have been tested and do not fail the TCLP. However, ADEQ recommends that you have your spent green-tipped lamps analyzed to confirm they are non-hazardous; alternatively, assume they are hazardous waste and handle them accordingly. ADEQ also recom-

mends that the facility keep hazardous and/or non-hazardous waste determination records on file and periodically retests or checks for updated literature.

Green-tipped lamps still contain mercury and should be managed to prevent breakage. ADEQ encourages the recycling of all mercury-containing lamps, regardless of the mercury content. Spent lamps can be recycled to recover mercury, glass, and metal.

Management:

Regulatory Determination

Lamps can be managed as hazardous waste (regulations found in 40 CFR Part 262 and A.A.C. R18-8-262) or as universal waste (regulations found in 40 CFR Part 273 and A.A.C. R18-8-273). If managing the lamps as hazardous waste, the facility must make a determination of how many lamps are generated per month to determine the generator status (ADEQ estimates that 350 four-foot lamps will generate 100 kg of hazardous waste). If managing the lamps as universal waste, the facility must make

a determination of how many lamps are accumulated on-site at any one time to determine the handler status (<5,000 kg on-site is considered a Small Quantity Handler of Universal Waste).

Location

Identify an area in your facility where universal waste lamps will be stored. This area should be away from high-traffic areas, should be clean, dry, and free of broken lamp debris, and should ideally have an independent air handling system to help minimize employee exposure to mercury in the event a lamp is broken.

Handling of Lamps

Employees handling lamps must understand the Universal Waste Rule for lamps. The lamps should be handled carefully to prevent breakage, placed immediately in a sturdy container, and brought to the universal waste storage area.

Storage of Spent Lamps

Lamps must be stored in a container that is structurally sound and compatible with the contents of the lamp. It also should lack evidence of leakage, spillage, or damage that could cause

releases of mercury.

The container should be stored in such a way that it will not tip over and must be closed unless actively adding or removing universal waste lamps. The container must be labeled or marked with the words "Universal Waste – Lamp(s)," or "Waste Lamp(s)," or "Used Lamp(s)." A label with those words can be affixed to or the words can be written on the container.

A handler of universal waste lamps must be able to demonstrate the length of time that the lamps have been accumulated as a waste. The handler may not accumulate universal waste for longer than one year. Demonstrating accumulation time can be accomplished by:

- a.) marking or labeling the container or storage area with the first date a lamp was placed in the container, or
- b.) maintaining an inventory system on-site that identifies the date each lamp became a waste or the earliest date that a lamp in a group of lamps became a waste.

Developing a recycling program:

1. Assess your facility with the following questions:
 - *How many lamps are in your facility?*
 - *Where are they located?*
 - *How many lamps are replaced per month or year?*
 - *How do you currently manage and store spent lamps?*
 - *Do employees know who to call if a lamp is burned out?*
2. Consult federal and state regulations concerning universal waste lamps.
3. Select a recycler that will best serve your needs and can provide assurance that your lamps are being properly managed. Consider the following criteria in selecting a recycler:

- **Service:** responsiveness, timeliness, flexibility, capabilities
 - **Risk Management:** environmental record and compliance history, government permits and approval for facility operations and transportation, maintained debris and dust-free public areas, insurance requirements for general and pollution liability are met, and indemnities or other assurances offered to clients.
4. Establish a process for handling and storing spent lamps. See the above section for recommendations.
 5. Getting your spent lamps to the recycler is important.
 - **Pick-Up Service:** offered by transportation companies or the recycler.
 - **Mail-In or Box Program:** the recycler may provide a container for your spent lamps, which can be

shipped when filled. In this program, your facility must ensure the containers meet all proper packaging, labeling, and shipping requirements.

- **Self-Transport:** you can transport the lamps to the recycling facility yourself. Ensure the lamps are managed in a way that prevents breakage.
6. Educate employees about the dangers of mercury, importance of minimizing the release of mercury, and your management procedures for lamp handling and storage. Employees must be trained in accordance with applicable state and federal requirements.
 7. Keep records of your recycling efforts, including documentation like a receipt or certificate that the recycler is properly recycling the lamps.

Containers holding lamps should not be overfilled or underfilled when shipped. Care should be used when stacking boxes to keep the lamps from being crushed. Do not secure lamps together with tape or rubber bands.

Broken Lamps

Once a lamp breaks, it releases mercury vapors into the air so it is important to ensure the immediate cleanup and containment of the lamp debris. Make sure your facility has proper procedures for reporting and managing broken lamps. Accidentally broken lamps and their debris can be managed as universal waste, whereas, intentionally broken lamps and their debris must be managed as hazardous waste unless other exemptions apply (i.e. lamps were generated in a household or a CESQG facility).

EPA recommends that broken lamps are to be kept in a sealed container, preferably glass or metal. Containers should be removed from the building as soon as possible and kept in a cool place, away from high-traffic areas, in the Universal Waste Storage Area or the 180/90-Day Hazardous Waste Storage Area. Containers of broken lamps should not be opened to add or remove broken lamps. Follow OSHA, EPA, and state regulations when managing broken lamps.

Drum Top Crushers:

Drum-top crushers (DTCs) are devices that fit on the top of a 55-gallon drum and crush fluorescent lamps into the drum; they are typically used to reduce waste lamp storage and transport.

Arizona allows the use of DTCs but all manufacturer requirements must be followed. A business that uses a DTC must follow applicable hazardous waste generator rules found in 40 CFR Part 262 and A.A.C. R18-8-262. Intentionally crushed lamps must be counted towards the generator's monthly hazardous waste generation and must be managed as hazardous waste at the point of generation.

A generator must minimize the release of hazardous waste to the environment.

Facilities using DTCs must minimize the release of mercury from the device. For example, facilities could prevent a release of mercury by having a control device on all DTCs to prevent emissions and by not transferring crushed lamps to another container. DTCs must be used in a cool room with adequate ventilation that does not recirculate the air per manufacturer requirements. Filters used in DTCs may be hazardous waste. Facilities must have a waste determination for these filters per 40 CFR Part 261.

Facilities using DTCs to crush "green-tipped" lamps must ensure that only "green-tipped" lamps are being crushed. EPA has found that DTCs can cause exposures of mercury even with low mercury "green-tipped" lamps. ADEQ highly recommends that these facilities monitor mercury levels and install control devices to minimize the release of mercury from the "green-tipped" lamps.

ADEQ does not endorse nor discourage the use of DTCs, but highly encourages the recycling of all mercury-containing

lamps, regardless of the mercury content. ADEQ highly recommends that facilities periodically perform waste determinations on these crushed lamps, and keep this documentation on file.

The Arizona Industrial Commission may specify additional requirements for businesses operating bulb crushers. For additional information, please call (602) 542-5795.

Where can I get more information?

For additional information please contact ADEQ:

Hazardous Waste Inspections and Compliance Unit

Waste Programs Division
1110 W. Washington St.
Phoenix, AZ 85007
(602) 771-4673 or
Toll free at (800) 234-5677 Ext. 771-4673
Hearing impaired persons call
ADEQ's TDD line: (602) 771-4829
www.azdeq.gov/enviro/waste/index.html



Drum top crusher use is regulated by applicable hazardous waste generator rules.

The following Web sites offer additional information:	
EPA's Universal Wastes:	www.epa.gov/osw/hazard/wastetypes/universal/
EPA's Compact Fluorescent Light Bulbs (CFLs):	www.epa.gov/bulbrecycling
EPA's Spent Mercury-Containing Lamp Recycling:	www.epa.gov/wastes/hazard/wastetypes/universal/lamps/index.htm
EPA's Management and Disposal of Mercury-Containing Light Bulbs (Lamps):	www.epa.gov/wastes/hazard/wastetypes/universal/lamps/faqs.htm#43
EPA's Mercury and Mercury Containing Products:	www.epa.gov/mercury www.epa.gov/epawaste/conserve/tools/stewardship/products/mercury.htm
EPA's Broken Lamps Clean-up Procedures:	www.epa.gov/mercury/spills/index.htm#fluorescent
EPA's Local Recycling Options for Households:	www.epa.gov/bulbrecycling
EPA's Mercury Lamp Drum-Top Crusher Study:	www.epa.gov/waste/hazard/wastetypes/universal/drumtop/index.htm
Energy Star on Compact Fluorescent Lamps (CFLs):	www.energystar.gov/cfls
Earth 911:	www.earth911.org

Spent Lamp Management Facilities in Arizona:

Recycling your lamps can be accomplished through regular pick up by hazardous waste transporters, mail-in prepaid boxes offered by a number of different retailers, or by dropping off your lamps at one of the following facilities:

WM LampTracker, Inc.	10 S. 48th St., Suite #4 Phoenix, AZ 85043	(602) 353-9282 (800) 414-0443
Lighting Resources, LLC	1522 E. Victory St., Suite #4 Phoenix, AZ 85040	(602) 276-4278
Veolia Environmental Services	5752 W. Jefferson St. Phoenix, AZ 85043	(602) 233-2955

Treatment, Storage, & Disposal Facilities in Arizona

Clean Harbors	1340 W. Lincoln St. Phoenix, AZ 85007	(602) 258-6155
Heritage Environmental Services, LLC	284 E. Storey Rd. Coolidge, AZ 85228	(520) 723-4167
Safety-Kleen Corporation	4161 E. Tennessee St. Tucson, AZ 85714	(520) 790-7714
Safety-Kleen Corporation	6625 W. Frye Rd. Chandler, AZ 85226	(480) 940-7202