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I. Introduction

Universal waste is a category of widely generated hazardous waste that poses a relatively low risk to human health and/or the environment during accumulation, storage, and transport. While a majority of hazardous waste is generated by laboratories or in industry, universal wastes are generated by nearly every type of business, as well as in private residences. Because of the low risks and widespread use associated with universal waste, the regulations pertaining to universal waste management are much less stringent than those for non-universal hazardous wastes.

II. Regulatory Authority

Universal waste is regulated by the Environmental Protection Agency under 40 CFR 273 (Standards for Universal Waste Management) and the Wisconsin Department of Natural Resources, Requirements for Universal Waste Management.

III. Universal Waste Types/ Definitions

Hazardous wastes that can be handled as universal waste include batteries, pesticides, mercury containing devices, lamps, cathode ray tubes, and antifreeze.

A. Batteries

There are many types of batteries with various chemical compositions. They can be of varying shapes, sizes, and styles: cylindrical, rectangular, flat cells, button cells, lantern, nine volt, and battery packs are all common. The battery chemistry is what determines its regulatory status. Batteries regulated as universal waste have one of the following chemistries: lead acid, nickel cadmium, silver, mercury, or lithium.

All batteries except large lead acid batteries are disposed of through BatteriesPlus...
Recycling program.
Large lead acid batteries can be disposed of through the BatteriesPlus recycling program or taken directly to a local recycling center by the EH&S Department.

B. Pesticides

Pesticides that are listed in the Wisconsin Department of Natural Resources Universal Waste Management Standards NR763.03 can be managed as universal waste if one of the following conditions is met:

1) The pesticide is a recalled pesticide that has been suspended or cancelled and is either part of the voluntary or mandatory recall under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) or is not in compliance with FIFRA; or

2) The pesticide is part of a collection and management program administered or recognized by the WDNR.

C. Mercury Containing Devices

Thermostats, thermometers, manometers, barometers, sphygmotonometers, relays, and switches are all devices that can contain mercury. These devices can be managed under the universal waste rule provided they are intact.

D. Lamps

A lamp, or the bulb or tube portion in an electrical lighting device, contains a small amount of mercury. Small amounts of cadmium can also be present in some types of lamps. For these reasons, they must be managed as universal waste.

As with batteries, there are several shapes, sizes, and styles of lamps available. Small compact, U-tubes, circline, four foot straight, eight foot straight, and standard light bulb shapes are all very common. Lamps regulated as universal waste can be fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps.

E. Cathode Ray Tubes (CRTs)

Cathode ray tubes (CRTs) are the video display portion of a computer monitor or television set. CRTs contain a significant amount of lead. For examples, a 27-inch CRT-type television contains about 8 pounds of lead. The presence of lead requires that CRTs be managed as universal waste.

F. Waste Antifreeze

Ethylene glycol and propylene glycol are the common constituents of antifreeze. Neither of these is regulated as a hazardous waste if not used in an automotive application. During automotive use, antifreeze chemically breaks down and becomes acidic, corroding the engine’s cooling system. This corrosion causes the antifreeze to become contaminated with lead particles. Additionally, the antifreeze may become contaminated with gasoline, which contains benzene. Waste antifreeze may be managed under the WDNR Universal Waste Management Standards.

IV. Universal Waste Handler Status

The first step in management of universal waste is to determine the handler classification. Handler classification is based on the total amount of all of the universal waste that is accumulated. The three classifications for handling universal waste are small quantity handler, large quantity handler, and very large quantity handler.
A small quantity handler accumulates less than 5,000 kilograms (11,000 pounds) of universal waste on site at any time;  
A large quantity handler accumulates more than 5,000 kilograms (11,000 pounds) but less than 20,000 kilograms (44,000 pounds) of universal waste on site at any time, and  
A very large quantity handler accumulates 20,000 kilograms (44,000 pounds) or more of universal waste on site at any time.

The Marquette University is a **small quantity handler** of universal waste.

V. Universal Waste Accumulation Sites

The University collects and stores universal wastes at the following locations:

**See Attachment:**

VI. Accumulation Time Limits

Universal waste can be accumulated for **up to one year** from the date the universal waste became a waste. The amount of time that a universal waste has been accumulated must be demonstrated, in one of the following ways:

1) Direct marking of the universal waste with the date that the universal waste became a waste;  
2) Marking the container the waste is in with the earliest date that waste began accumulating in that container;  
3) Marking a designated accumulation area with the earliest date that waste began accumulating in that area;  
4) Keeping an inventory that identifies the date that each universal waste became waste; or  
5) Keeping an inventory that identifies the earliest date that a universal waste became waste in a designated accumulation area.

VII. Universal Waste Management Requirements

A. General Requirements for All Universal Waste Types

As with other hazardous waste, proper storage and handling of universal waste is critical to ensuring personnel safety and compliance with appropriate regulations. General management requirements for all types of universal wastes are as follows:

1) Handlers will not dispose of universal wastes;  
2) Handlers will not dilute or treat universal waste, except when responding to releases;  
3) Universal waste will be managed in a way that prevents a release of any component of the universal waste;  
4) If containment of a universal waste is required, the container will be (a) closed at all times except when adding or removing waste (b) compatible with the universal waste and it's contents, and (c) free of defects, design characteristics or damage that would lead to leakage, spillage or other environmental releases;  
5) Universal waste stored outside must be covered, to prevent precipitation from coming into
contact with the waste; and

B. Requirements for Batteries

A battery becomes universal waste on the date that it is removed from service, either because it is no longer operable or because it is no longer wanted or needed.

The following management activities are allowed provided the individual battery cases are not breached, are intact, are closed except to remove electrolyte, and are immediately closed after electrolyte is removed:

Battery sorting;
Mixing battery types in one container;
Removing the electric charge by discharging;
Regenerating used batteries;
Disassembling battery packs into individual batteries or cells;
Removing batteries from consumer products; and
Removing electrolyte from batteries.

**NOTE:** Each battery or container of batteries must be labeled with one of the following: Universal Waste – Battery, Waste Batteries, or Used Batteries. Please see Appendix A for an example of a Universal Waste Label.

C. Requirements for Mercury-Containing Devices

Any used or unused mercury-containing device becomes a waste on the date that it is no longer operable or on the date that the handler decides to discard it. To manage a mercury-containing device as a universal waste, the following requirements must be met:

1) Mercury containing devices that show any sign of leaking, spilling, or damage that could cause spillage must be stored in a container that is closed, compatible with the waste, and free of defects that could cause leakage.

2) Ampoules containing mercury should not be removed from a mercury containing device.

3) If any waste is generated from a mercury-containing device breakage or emptying of ampoules (i.e., ampoules themselves, spill clean-up debris), the waste handler must determine if it exhibits the characteristic of hazardous waste for mercury. If the waste does meet the characteristic, it must be managed as a hazardous waste.

**NOTE:** Mercury containing devices or mercury device storage areas must be labeled with one of the following: Universal Waste - Mercury Containing Device(s), Waste Mercury-Containing Device(s), or Used Mercury-Containing Device(s). Please see Appendix A for an example of a Universal Waste Label.

D. Requirements for Lamps

A lamp becomes a waste on the day that it is removed from service, either because it is burned out or is no longer wanted or needed.

Lamps may not be intentionally crushed or dismantled. If lamps are unintentionally broken, the broken lamp and residue must be cleaned up and the area decontaminated. The broken lamps and clean-up debris may be managed as universal waste. Please refer to Appendix B for Broken Fluorescent Lamp Cleanup Guidelines.
NOTE: Lamps or lamp accumulation areas must be marked with the date the lamp is removed from service or the date the first lamp was placed in the storage accumulation area and one of the following: Universal Waste - Lamp(s), Waste Lamp(s), or Used Lamp(s). Please see Appendix A for an example of a Universal Waste Label.

E. Requirements for Cathode Ray Tubes (CRTs)

A cathode ray tube becomes a waste on the day that it is determined to be non-repairable or unusable for its original purpose.

Handlers of CRTs may not intentionally break or shred a cathode ray tube unless the following are met:

The handler installs and maintains a system designed to minimize release via wind dispersal, run-off, and direct releases;
Breaking, shredding, and storage practices do not pose a hazard to human health or the environment;
The handler prevents exposure of humans or the environment to harmful quantities of lead or other hazardous constituents;
Before transporting or offering shredded CRTs for transport, the handler packages the CRTs in containers that are impermeable, closed, and designed to prevent a release to the environment; and
Any spill clean-up debris, or other residual waste generated from the breaking or shredding of CRTs that exhibits a characteristic of hazardous waste, must be managed as a hazardous waste.

NOTE: A Cathode Ray Tube or CRT accumulation area must be marked with the one of the following: Universal Waste - Cathode Ray Tube(s), Waste Cathode Ray Tube(s), or Used Cathode Ray Tube(s). Please see Appendix A for an example of a Universal Waste Label.

F. Requirements for Used Antifreeze

Used antifreeze becomes a waste on the date that the antifreeze becomes unsuitable for its original purpose due to the presence of physical or chemical impurities or loss of original properties, or on the date that the handler decides to discard it.

NOTE: Used antifreeze containers must be marked with one of the following: Universal Waste - Antifreeze, Waste Antifreeze, or Used Antifreeze. Please see Appendix A for an example of a Universal Waste Label.

G. Requirements for Pesticides

A recalled pesticide will become waste on (a) the date that the manufacturer of the recalled pesticide agrees to participate in the recall and the person conducting the recall decides to discard the pesticide, or (b) when the handler decides to discard the unused pesticide.

Universal waste pesticides must be containerized in a container compatible with the waste, or over-packed in a waste container that is compatible. These pesticides must be labeled with the original label that accompanied the pesticide at the time of sale or distribution and the words Universal Waste-Pesticide(s) or Waste- Pesticide(s).

1) Universal waste pesticides must be stored on an impervious surface. An impervious surface may be concrete or asphalt (without cracks or holes). Earth, wood, and gravel surfaces are not considered impervious surfaces.

2) Waste pesticides that contain free liquid may not be stored in an area with functional floor drains or
manholes unless secondary containment is present. If secondary containment is necessary, it must be sufficient to contain a spill from the largest container in the secondary containment. Containment is not required in areas with functional floor drains or manholes provided:

The waste pesticide contains no free liquid, and
The area is sloped or drained to remove precipitated liquid or containers are elevated or otherwise protected from accumulated precipitation.

1. Security Measures

The following security measures must be provided at all outdoor storage areas for universal waste pesticide:

An artificial or natural barrier that completely surrounds the universal waste pesticide storage area to prevent unauthorized entry by people or livestock;
An entry that is controlled at all times; and
A sign at all entries to the storage area with the legend, “Danger – Unauthorized Personnel Keep Out,” or other words indicating that only authorized personnel are allowed entry and that the area is dangerous.

2. Preparedness and Prevention

The following applies only to the management of universal waste pesticides:

a. The following equipment must be present in sufficient quantity to handle the amount of universal waste pesticide accumulated:
   Portable fire extinguishers;
   Fire control equipment;
   Spill control equipment; and
   Decontamination equipment.

b. Aisle space must be maintained to allow unobstructed movement of personnel, fire control equipment, spill control equipment, and decontamination equipment.

c. Emergency contact information must be posted at the telephone nearest to the accumulation site. The posted information must include:
   Spill control equipment;
   Marquette University Public Safety 8-1911)
   Wisconsin Department of Natural Resources
   Emergency Response Team telephone number (Veolia Emergency Response, 1-800-688-4005); and
   Steps to take in an emergency.

VIII. Inspections

There are no inspection requirements for small quantity handlers of universal waste.

IX. Off-Site Shipment/Transportation

Universal waste may only be sent to another universal waste handler or a Transfer, Storage, Disposal, or Recycling Facility (TSDRF). Prior to shipping universal waste off-site, the generator of the waste must obtain approval from the destination facility.

If a universal waste meets the definition of a hazardous material under US Department of Transportation regulations, the handler must comply with the DOT requirements set forth in 49 CFR 172-180.
The university may self-transport universal waste to another handler or TSDRF. In the event that MU decides to self-transport universal waste, the university will comply with the requirements for Universal Waste Transporters.

X. Record Keeping and Tracking

The handler must keep a record of each shipment. The record can be in the form of a log sheet, an invoice, a manifest, a bill of lading, or another type of shipping document. The record must include the following information:

- Spill control equipment;
- The name and address of the universal waste handler;
- Destination facility;
- Quantity of each type of universal waste; and
- Date of shipment.

The University keeps both bills of lading and invoices for each shipment of universal waste in the Office of Environmental Health and Safety. These records will be kept for at least three years from the date of shipment.

XI. Employee Training

A small quantity waste handler must ensure that all employees who manage or handle universal waste are thoroughly familiar with waste handling methods and emergency procedures applicable to the waste they are handling, relative to their responsibilities during normal University operations and emergencies. Additionally, employees who handle or manage universal waste pesticides must be trained in accordance to the requirements of 40 CFR 265.16 (Hazardous Waste training requirements).

MU personnel who manage universal waste are trained annually. Training meets the requirements for universal waste (including universal waste pesticides).

Appendix A: Universal Waste Label

The label below, or one containing similar information, will be used to mark universal wastes.
Antifreeze

Batteries

Cathode Ray Tubes

Mercury Containing Devices

Accumulation Start Date _________________ Month / Day /
Appendix B: Broken Fluorescent Lamp Clean Up Guidelines

Only trained, authorized personnel may perform the clean up of broken fluorescent light bulbs at MU. Campus community members should not attempt to clean up broken fluorescent light bulbs. If you have witnessed a fluorescent lamp break at MU, please contact the Facilities Support Center at 8-7043. If you have questions about these procedures or general questions about mercury, please call the Office of Environmental Health and Safety ext. 8-8411.

Clean Up Procedures

NOTE: The following procedures are to be used in the event that up to four 4-foot fluorescent light tubes, two 8-foot fluorescent light tubes, or eight compact fluorescent light bulbs, break at one time. Facilities Operations and Maintenance will hire an environmental contractor to manage the clean up of broken bulbs in excess of these quantities.

1. Gather clean up materials or a pre-prepared fluorescent bulb clean up kit. This must include safety glasses, heavy gloves (use nitrile, natural rubber, or PVC only), disposable shoe covers, a dust pan, a squeegee, small pieces of cardboard with at least one straight edge, paper towels, a small spray bottle filled with water, air-tight sealable 6-mil plastic disposable bags or a rigid plastic container with a tight-fitting lid, a flashlight, duct tape, and mercury absorbent powder (commercially available from various safety distributors).

2. Remove jewelry and put on personal protective equipment (gloves, disposable shoe covers, and safety glasses).

3. Secure the area around the breakage to keep broken bulb debris from being tracked to other areas. Close doors and restrict access to the room until clean up has been completed.

4. Turn off all fans and air conditioning systems to prevent mercury vapors from being circulated to other areas. Open a window for ventilation.

5. Wait 5 minutes before beginning. Never use a vacuum cleaner for cleaning up a mercury spill and never flush mercury down the drain.

6. Hard Flooring: Begin removing broken glass with dustpan, cardboard, or squeegee. Work from the outer edge of the debris area, moving in towards the center. Place the broken pieces in a disposal bag or container. Shine a flashlight to find glass fragments. Use duct tape to pick up glass fragments. Avoid skin contact.

7. Carpeted Areas: Fold or roll the carpet so that mercury debris is trapped inside and place the carpet in a plastic bag for disposal. If breakage is on wall-to-wall carpet, the Facilities Support Center can arrange for an environmental clean up contractor for assistance.

8. Sprinkle mercury absorbent powder on the breakage site to stop the release of vapors. Mist powder with water from a spray bottle. Wipe up the powder with a moist paper towel and place in a sealed container with other contaminated debris.

9. Carefully remove gloves by turning them inside out to contain any powder on the surface of the gloves. Place all debris, clean up materials, tools and equipment, and any contaminated clothing in a double bag and place in a sealed container and keep in a safe place for pickup. Wash skin using soap and water following clean up.

10. Contact the Office of Environmental Health and Safety to remove waste from the site.