



NORTHERN ARIZONA UNIVERSITY

Universal Waste Management Plan
March, 2009

Index

- 1.0 General Information
- 2.0 Policy Statement
- 3.0 Northern Arizona University Universal Waste Handler Status
- 4.0 Definitions of Universal Waste
 - 4.1 Universal Waste Batteries
 - 4.2 Universal Waste Pesticides
 - 4.3 Universal Waste Mercury Containing Equipment
 - 4.4 Universal Waste Lamps
- 5.0 Handling of Universal Wastes
 - 5.1 Handling Batteries
 - 5.2 Handling Mercury-containing Equipment
 - 5.3 Handling Pesticides
 - 5.4 Handling used lamps
- 6.0 Labeling of Universal Wastes
 - 6.1 Universal Waste Labeling – Batteries
 - 6.2 Universal Waste Labeling- Pesticides
 - 6.3 Universal Waste Labeling- Mercury Containing Equipment
 - 6.4 Universal Waste Labeling- Lamps
- 7.0 Universal Waste Containers Requirements
 - 7.1 Battery Containers
 - 7.2 Pesticide Containers
 - 7.3 Mercury-containing Equipment Containers
 - 7.4 Lamp Containers (Mercury Containing Lamps)
- 8.0 Universal Waste Accumulation Areas
- 9.0 Proper Disposal of Universal Wastes
- 10.0 Universal Waste Management
 - 10.1 Waste Management - Batteries
 - 10.2 Waste Management - Pesticides
 - 10.3 Waste Management - Mercury Containing Equipment
 - 10.4 Waste Management - Lamps
- 11.0 Personnel Training
- 12.0 Record Keeping

Appendix A Broken Fluorescent Lamp Clean-Up Procedure

1.0 General Information

This document complies with 40 CFR 273 as referenced in the Arizona Administrative Code R18-8-273 - Standards for Universal Waste Management.

2.0 Policy Statement

The purpose of the Universal Waste Management Policy at Northern Arizona University (NAU) is to ensure that the university is in compliance with all federal and state regulations governing the handling and disposal of universal wastes. Furthermore it is the policy of NAU to protect employees, students, the general public and the environment from any exposure to the hazards of universal waste (UW). The NAU Universal Waste Management Policy covers all handlers of UW on NAU's Mountain Campus. No UW will be disposed of in any solid waste receptacle, but will be collected and stored until disposed of through an appropriate facility.

3.0 Northern Arizona University Universal Waste Handler Status

Northern Arizona University is a Small Quantity Handler of UW (SQHUW) as defined in 40 CFR 273.9. As a SQHUW, NAU is allowed to accumulate up to 5,000kg (11,000 lbs) of UW at any given time (40 CFR 273.9). NAU is allowed to store UW for up to 1 year without treatment, recovery or disposal. At the 1 year accumulation period, UW disposal must occur (40 CFR 273.15). As a SQHUW an EPA identification number is not needed for UW disposal. (40 CFR 273.12)

4.0 Definitions of Universal Waste

Universal wastes are defined in 40 CFR 261. The four categories of UW are:

4.1 Universal Waste Batteries (40 CFR 273.2)

Included are both discarded primary (non-rechargeable) and secondary (rechargeable) batteries. Batteries containing materials (cadmium, lead, mercury, etc.) that would render them Resource Conservation Recovery Act (RCRA) hazardous wastes are covered under the universal waste regulations.

4.2 Universal Waste Pesticides (40 CFR 273.9)

Classes of discarded pesticides those are eligible for management under the Universal Waste Rule

- (a) Stocks of unused suspended or canceled pesticides that are subject to a voluntary or mandatory recall under the section 19(b) of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), or a voluntary recall by a registrant of a pesticide that is not in compliance with FIFRA;

- (b) Stocks of other unused pesticide products that are collected and managed as part of a waste pesticide collection program.

4.3 Universal Waste Mercury Containing Equipment (40 CFR 273.4)

Includes devices, items, or articles which contain elemental mercury *that is integral to their functions* and which would otherwise be regulated as a hazardous waste when discarded by virtue of exhibiting the toxicity characteristic (TC) for mercury and that fail the Toxic Contaminant Leaching Procedure (TCLP)

- (a) Mercury-containing thermostats (formerly a separate universal waste category in the original rule), thermometers, barometers, mercury switches, and some meters, regulators, and gauges, in which elemental mercury is contained in ampoules or otherwise enclosed and can be managed intact.

4.4 Universal Waste Lamps (40 CFR 273.9 (c))

Types of lamps include

- (a) Fluorescent bulbs, which include linear, U-tube and circline fluorescent tubes, bug zappers, tanning bulbs, black lights, germicidal bulbs, high output bulbs, cold-cathode fluorescent bulbs, and compact fluorescent bulbs.
- (b) High intensity discharge bulbs, which include metal halide, ceramic metal halide, high pressure sodium, and mercury vapor;
- (c) Mercury short-arc bulbs;
- (d) Neon bulbs.

Hazardous waste lamps become subject to this rule when they are permanently removed from a fixture or determined to be discarded. Broken fluorescent light bulbs may not be crushed. If they are crushed or broken they must be managed as a hazardous waste rather than a Universal Waste.

5.0 Handling of Universal Wastes

Handling of Universal Waste will occur in such a manner as to mitigate personal and environmental exposure to hazardous materials.

5.1 Handling of Batteries

Improper storage and handling of universal waste batteries can pose special health and safety risks. Steps should be taken during the handling and storing of batteries to minimize the risks.

Mercury vapors may accumulate in sealed drums if stored for an extended period of time when storing batteries containing mercury. Containers should be placed in a well-ventilated area to minimize worker exposure to mercury vapor emissions when they are opened to add or remove batteries.

When accumulating different types of batteries, be aware that some types of batteries may be incompatible with each other. Explosion is another potential risk when batteries are stored in contact with one another. Waste batteries that contain a residual charge when collected together may discharge each other, creating heat and forming hydrogen gas. If the container is not properly ventilated, there is a potential for an explosion.

There is a potential for partially corroded batteries to leak caustic chemicals. If proper precautions are not taken, workers handling batteries may get chemical burns on their skin. Workers handling batteries should protect themselves by wearing protective clothing, including gloves and eye protection.

5.2 Handling mercury containing equipment

Universal waste mercury-containing equipment must be handled in such a way that prevents releases of any UW or component of UW to the environment. The procedures outlined in this section are required by law.

- (a) Mercury-containing equipment with non-contained elemental mercury or that shows evidence of leakage, spillage, or damage must be placed in a closed, structurally sound container. The container must lack evidence of leakage, spillage or damage, and must be designed to prevent the escape of mercury into the environment by volatilization or any other means.

- (b) Mercury ampoules may be removed provided
 - i. They are removed in such a manner as to prevent breakage
 - ii. Removal occurs over a collection device
 - iii. A mercury clean-up kit is readily available
 - iv. The removal area is well ventilated and monitored for OSHA compliance
 - v. Spilled or leaked mercury is immediately transferred to a storage container
 - vi. Employees are thoroughly trained in proper handling and emergency procedures.
 - vii. Removed ampoules are stored in closed, structurally sound, non-leaking containers in a manner that prevents breakage upon shipment
 - viii. Handlers of universal waste who removes mercury-containing ampoules from mercury-containing equipment or seals mercury from mercury-containing equipment in its original housing must determine whether the following exhibit a characteristic of hazardous waste identified in 40 CFR part 261, subpart C

- (c) Mercury-containing equipment that does not contain an ampoule may remove the open original housing holding the mercury from universal waste mercury-containing equipment provided the handler
 - i. Immediately seals the original housing holding the mercury with an air-tight seal to prevent the release of any mercury to the environment; and
 - ii. Follows all requirements for removing ampoules and managing removed ampoules under paragraph 5.2(b)
- (d) Waste resulting from spills or leaks and/or other solid waste generated as a result of the removal of mercury-containing ampoules or housings must be checked to see if it exhibits a characteristic of a hazardous waste. If so, it must be managed as a hazardous waste.
- (e) If a mercury containing device is broken the mercury must be appropriately collected and placed in the hazardous waste disposal system. Contact the Office of Regulatory Compliance (ORC) for spill clean-up and disposal of mercury

5.3 Handling Pesticides

Pesticides must be handled in such a way to protect personnel and the environment and must be stored in containers that meet the following specifications:

- (a) A container that remains closed, structurally sound, compatible with the pesticide, and that lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions; or
- (b) A container that does not meet the requirements of paragraph (b)(1) of this Section, provided that the unacceptable container is over packed in a container that does meet the requirements of paragraph 5.3 (a).

5.4 Handling used lamps

Intact used lamps will be gathered at the end of each day and will be delivered to the Universal Waste Accumulation Area located in building 77. Lamps are to be placed in the appropriate labeled and dated container. The container must be closed before exiting the area.

If a florescent light bulb is broken the entire lamp must be collected using appropriate procedures (See appendix A – Standard Operating Procedures for the Cleanup of Broken Lamps). Broken lamps must be managed as hazardous waste. A satellite waste accumulation area for broken bulbs has been setup in the Universal Waste Storage Area in Building 77.

6.0 Labeling of Universal Wastes

As a small quantity handler of Universal Waste NAU must specify the type of Universal Waste on each container and Universal Wastes must not be mixed (40 CFR 273.14)

6.1 Universal Waste Labeling – Batteries

Containers holding universal waste batteries must be clearly labeled with the following: ““Universal Waste—Battery(ies),” or “Waste Battery(ies),” or “Used Battery(ies)” (40 CFR 273.14(a)).

6.2 Universal Waste Labeling- Pesticides

Containers holding universal waste pesticides must be labeled with the following:

The label that originally accompanied the product or if that label is not legible another label accepted by the DOT under 49 CFR **and** marked with the words ““Universal Waste-Pesticide(s)” or “Waste-Pesticide(s)” (40 CFR 273.14 (b)(1&2)).

6.3 Universal Waste Labeling- Mercury Containing Equipment

Containers holding universal waste mercury containing equipment must be labeled with ““Universal Waste—Mercury Containing Equipment,” “Waste Mercury-Containing Equipment,” or “Used Mercury-Containing Equipment” (40 CFR 273.14(d) (1)).

Containers holding universal waste mercury-containing thermostats must be labeled with ““Universal Waste—Mercury Thermostat(s),” “Waste Mercury Thermostat(s),” or “Used Mercury Thermostat(s)” (40 CFR 273.14 (d)(2)).

6.4 Universal Waste Labeling- Lamps

Containers holding universal waste lamps must be labeled ““Universal Waste—Lamp(s),” or “Waste Lamp(s),” or “Used Lamp(s)” (40 CFR 273.14(e)).

7.0 Universal Waste Containers Requirements

Storage containers for each of the Universal Wastes must be appropriate for the waste.

7.1 Battery containers

The containers for batteries must meet the following criteria

- (a) The container must remain closed, except when batteries are being added or removed from the container.
- (b) The container must be structurally sound.
- (c) The container must be compatible with the contents of the battery.
- (d) The container must show no evidence of leakage or spillage.
- (e) The container must be appropriately labeled. (see section 6.1)

7.2 Pesticide Containers

The containers for pesticides must meet the following criteria

- (a) The container must remain closed.
- (b) The container must be structurally sound.
- (c) The container must be compatible with the contents of the pesticide.
- (d) The container must show no evidence of leakage or spillage or damage that could allow spillage.
- (e) The container must be appropriately labeled (see section 6.2).

7.3 Mercury Containing Equipment Containers

The container for mercury containing equipment must meet the following criteria

- (a) If the mercury shows leakage, spillage or damage the container must be closed and structurally sound and show no evidence of leakage, spillage or damage.
- (b) Ampoules containing mercury may be removed from equipment as long as the ampoules are intact; if they are not intact the mercury must be contained properly.
- (c) The container must be closed.
- (d) The container must be structurally sound.
- (e) The container must be compatible with mercury.
- (f) The container must be appropriately labeled (see section 6.3)

7.4 Lamp Containers (Mercury Containing Lamps)

The containers for mercury containing lamps must meet the following criteria

- (a) The container must be closed
- (b) The container must be structurally sound
- (c) The container must be appropriately labeled (see section 6.4)
- (d) The container must prevent breakage of the mercury containing lamps.

8.0 Universal Waste Accumulation Areas

A Universal Waste Accumulation Area has been setup in building 77 for the receipt and storage of all UW generated on NAU's Mountain Campus.

9.0 Proper Disposal of Universal Wastes

Universal wastes will be disposed of at least annually. As a small quantity universal waste generator a manifest is not required.

10.0 Universal Waste Management

The following complies with 40 CFR 273.13. NAU will manage all UW in ways that will prevent the UW from entering the environment.

10.1 Waste Management-Batteries

Handlers of UW batteries that show any evidence of spillage, damage or leakage will contain that battery in a container that is closed, structurally sound, compatible with the waste and that prevents spillage, or leakage to the outside of the container.

Handlers of UW batteries at NAU may conduct the following activities as long as the integrity of the battery is not breached

- (a) Sorting the batteries by type
- (b) Mixing battery types in one container (see Handling Batteries 5.1)
- (c) Discharging batteries so as to remove electric charge
- (d) Regenerating batteries
- (e) Disassembling batteries or battery packs into individual batteries or cells
- (f) Removing batteries from consumer products
- (g) Removing electrolyte from batteries

10.2 Waste Management- Pesticides

Nothing can be done to waste pesticides except proper and legal disposal.

10.3 Waste Management- Mercury Containing Equipment

Mercury containing ampoules may be removed from equipment for disposal. The ampoules must be kept in tact. In case of leakage, breakage or spillage the mercury must be appropriately collected. Call the Office of Regulatory Compliance for spill response and disposal..

10.4 Waste Management- Lamps

Universal waste lamps should be kept intact. In the case of breakage the entire lamp must be appropriately collected and treated as a hazardous waste. See appendix A for clean-up procedures of broken lamps.

11.0 Personnel training 40CFR 273.16

Personnel working with universal waste will be trained on the proper handling and emergency procedures appropriate to the type(s) of universal waste handled.

12.0 Record keeping

Training records will be retained to show compliance with 40CFR 273.16.

Appendix A



P:NAU:HW:1
Date: 3/20/2009
Supersedes: None
Page 1 of 1

Broken Fluorescent Lamp Clean-Up Procedure

1. Before Clean-up: Ventilate the Room
 - a. Turn off room air handling system. Open windows if applicable.
 - b. Personnel should leave the room, making sure not to walk through the breakage area on their way out.
 - c. Secure the area for 15 minutes or more before re-entering for cleanup.
2. Clean-Up Steps for Hard Surfaces
 - a. Put on personal protective equipment: disposable gloves.
 - b. Carefully scoop up glass fragments and powder using stiff paper or cardboard and place them in a sealed plastic bag.
 - c. Use sticky tape, such as duct tape, to pick up any remaining small glass fragments and powder.
 - d. Wipe the area clean with damp paper towels and place in plastic bag.
 - e. Do not use a vacuum or broom to clean up the broken bulb on hard surfaces.
 - f. Place paper and/or cardboard, gloves etc. into the plastic bag.
3. Clean-up Steps for Carpeting or Rug:
 - a. Put on personal protective equipment: disposable gloves.
 - b. Carefully pick up glass fragments and place them in a sealed plastic bag.
 - c. Use sticky tape, such as duct tape, to pick up any remaining small glass fragments and powder.
 - d. If vacuuming is needed after all visible materials are removed, vacuum the area where the bulb was broken.
 - e. Remove the vacuum bag (or empty and wipe the canister), and put the bag or vacuum debris in a sealed plastic bag along with gloves.
4. Managing the Mercury Waste
 - a. Write on the plastic bag containing the broken lamp and cleanup material "Hazardous Waste – Mercury" along with date.
 - b. Transfer plastic bag to satellite accumulation drum in Bld. 77 – Capital Assets & Services.
 - c. Contact the Office of Regulatory Compliance for additional information or assistance.



Universal Waste Fact Sheet

Background:

The Environmental Protection Agency (EPA) enacted the Federal "Universal Waste Rule" to reduce the amount of hazardous waste items that were making it into the municipal solid waste stream. The Arizona Department of Environmental Quality (ADEQ) implemented this rule by creating a streamlined procedure for recycling certain common hazardous wastes and reducing the regulatory burden on businesses that generate these wastes.. This fact sheet is designed to provide staff with an overview of the requirements for implementing NAU's Universal Waste Program.

Universal Wastes:

- ◆ **Hazardous batteries:** Nickel cadmium (NiCd), Lithium, and mercury containing button batteries. Lead-acid batteries not being reclaimed are classified as universal waste.
- ◆ **Mercury-containing lamps:** Intact fluorescent, metal halide, high pressure sodium, and mercury vapor
- ◆ **Mercury -containing devices:** Non broken thermometers, thermostats, manometers, switches
- ◆ **Hazardous waste pesticides:** Mercury-based, arsenicals, chlorinated, pesticides that have been recalled or banned from use, and/or pesticides that are obsolete, have become damaged or are no longer used due to changes in application practices.

Universal Waste Storage Area

- ◆ Northern Arizona University has one Universal Waste Storage Area located in building 77 (Capital Assets and Services).

Universal Waste Management Practices:

- ◆ **Label and date containers/boxes** - Containers or boxes used to collect and store Universal Waste must be labeled as "Universal Waste" and must also include the specific name of the waste item(s). For example, spent fluorescent lamp boxes should be labeled as Universal Waste – Spent Fluorescent Bulbs. In addition, the label must be marked with the accumulation start date. The on-site storage limit for universal wastes is one year. To ensure consistency in labeling practices across the University, standard labels can be obtained at the Universal Waste Accumulation Area in building 77 (Capital Assets and Services)

When Universal Waste becomes Hazardous Waste

Broken lamps

- ◆ Broken lamps must be managed as hazardous waste. A satellite waste accumulation drum for broken lamps is located in building 77 (Capital Assets and Services). A procedure on how to clean up broken bulbs can be found on the Office Of Regulatory Compliance website:
<http://www.orc.nau.edu/>.

Leaking Mercury-containing devices

- ◆ Leaking mercury-containing devices must be managed as hazardous waste. If you have a leaking mercury-containing device (example: Broken thermometer) Contact NAU Police at ext. 3-3000.