Program Statement

The goal of the Hazardous Waste Management Program (HWMP) is to protect the health and safety of employees, students, and the environment while complying with applicable state and federal regulations. Implementation of a waste minimization program is vital to an effective hazardous waste management program. By utilizing procedures established within the HWMP, the quantity and cost of hazardous waste disposals can be effectively reduced, the environment will be protected, and campus personnel safety will be enhanced. Planned purchases of only necessary quantities of chemicals and closeouts of laboratories will greatly reduce the hazardous waste output.

All materials classified as a hazardous waste will be stored, managed, and promptly removed from Campus for disposal using methods that comply with Federal, State, and Local regulations. This includes waste chemicals, out-of-date reagents, solvents, thinners, cleaning fluids, batteries, light bulbs, ballasts, and any other discarded material.

Applicable regulations include Title 40 of the Federal Code of Regulations at part 262 and Alabama Department of Environmental Management Administrative Code r. 335-14-x-.xx.

A hazardous waste is one which meets the criteria outlined in Appendix A of this policy, *Hazardous Waste Determination*. Briefly, these wastes meet the defined criteria and are either a characteristic waste (ignitable, corrosive, reactive, or toxic) or are a listed waste (F, K, P, or U Lists).

Other wastes may be generated which do not meet the definition of “hazardous” but which must also be managed with special considerations. Polychlorinated biphenyls (PCBs) and radioactive materials are two examples. Both have hazards associated with them but are governed by different regulations.

Objectives

To ensure that all UNA personnel who generate hazardous and/or regulated wastes know:

- Their responsibility in the identification, collection, storage and disposal of these wastes,
- The procedures for the disposal of hazardous and/or regulated wastes.

General Procedures

1. The University will provide suitable containers and collection areas for storing wastes held for disposal. The generating department is responsible for the cost of containers.

2. Prior approval from the Environmental Health and Safety (EHS) Department must be obtained before:
    a. Designating an area to collect hazardous/regulated waste.
    b. Mixing waste streams. Generally, this should be avoided, but in certain circumstances, it is acceptable, such as when components have similar chemical properties or characteristics.

3. Flammable and combustible liquids shall be stored in well-ventilated areas and in compliance with standard fire protection methods.

4. Accumulation of hazardous/regulated wastes in Campus facilities will be limited by periodic removal of these wastes based on the generator status (see Appendix C for more details).

5. All hazardous/regulated wastes will be packed in compatible groups and removed from campus by an EPA-approved contractor.

6. Labeling and transportation of hazardous/regulated wastes will comply with all applicable DOT regulations.

7. All hazardous/regulated wastes will be sent to an EPA-approved Treatment, Storage and Disposal (TSD) facility.

Identification

1. The waste generator is responsible for the identification of waste chemicals. All waste receptacles should be marked with labels that identify their contents. The waste label shall contain the following information:

Type of Waste	Label Contents, while being filled	Label Contents, when full
Hazardous	• The term “hazardous waste” • Identity of waste (if “profiled”, % composition not required) • EPA Waste Code	• Same as column on left but with date container was full. • Storage time limit based on Generator status. See Appendix B for details.
Universal	• The term “Universal Waste” • Identity of waste • The date container starts collecting waste	• Same as column on left. • Container must leave site within 1 year of date.

The waste generator should try to determine the identification of unlabeled, mislabeled or unknown chemical wastes. It is encouraged to obtain as much information as possible before submitting samples for chemical analysis. Laboratory analysis of unknown waste is costly. Unknown waste streams can be easily avoided by proper management.

Waste Containers

1. Chemical wastes shall be stored in containers compatible with contents and in good condition (no evidence of leaking, bulging, or corrosion). The contents of each container shall be identified. An inventory of full containers of hazardous wastes is maintained by the EHS Department.

2. Solid chemical wastes shall be stored in sturdy containers similar to those used for storage of the source materials. Liquid chemical wastes shall be placed in containers designed for that purpose. Secondary containment should be used in all cases when chemical spillage is possible. Full containers of liquid waste stored in Accumulation Areas will be placed in secondary containment. It is advised to place all glass waste

containers in secondary containment.

3. Federal law prohibits the disposal of any wastes containing untreated regulated chemicals into sanitary and storm sewers. See Appendix B, *Guide to Laboratory Sink/Sewer Disposal of Wastes* for information on which chemicals may be disposed of by the sanitary sewer.

Suggestions to Limit Disposal Costs

1. Waste management starts at the time the chemical is ordered. Because some materials may become out of date or out of specifications, they can create a disposal challenge. Some chemicals degrade (e.g., ethers can form explosive peroxides) and create extremely dangerous materials, which can impact employee safety as well as disposal costs. Purchasing the minimum amount required supports the University's Waste Minimization Program.

2. The amount of the material ordered should be limited to that needed to complete the project at hand. Chemicals packaged in large containers can create unnecessary hazards and a disposal problem later in their life cycle.

3. Make sure you know procedures for disposal of chemical wastes before you initiate the project. Cost of the disposal of hazardous wastes shall be included in the regular project budgets.

4. Please remember that pouring chemicals into the sanitary sewer is dangerous and most probably illegal.

5. Obtaining free samples or material from other research institutions, schools, organizations, or companies could generate a hazardous waste. It is recommended that consideration be given to disposal before accepting any of these.

Hazardous Waste Determination

Before discarding any waste, a hazardous waste determination should be conducted and documented. Hazard Determination records are subject to inspection by State and Federal agencies. Work with the EHS Department to conduct the Hazard Determination.

For the identification of hazardous wastes, refer to Appendix A of this section, or contact the EHS Department.

Waste Generation Status

The waste generator status of an organization is determined by the amount of waste that is generated per month.

For a definition of generator categories and their respective responsibilities, refer to Appendix C.

Transportation of Hazardous Wastes

1. All off-site shipments of hazardous wastes shall comply with EPA and DOT regulations. The applicable EPA and DOT regulations are found respectively in 40 Code of Federal Regulations Part 262 and 49 CFR Part 172.

2. For more information on transportation of hazardous waste requirements see Appendix D.

The Hazardous Waste Manifest

1. A hazardous waste manifest is a multi-copy shipping document that must be filled out and used to accompany hazardous waste shipments. The manifest form is designed so that shipments of hazardous waste can be tracked from their point of generation to their final destination (Cradle-to-Grave).

2. The hazardous waste generator, the transporter, and the designated TSD facility must each sign the manifest and keep a copy. The TSD operator must send a copy of the completed manifest back to the generator. This document is assurance that the waste has been accepted by the designated TSD. The form must be kept on file for three years.

3. The TSD facility should return a signed copy of the manifest to the generator within 30 days of the waste shipment. If it has not been received, contact the TSD facility to determine if the waste was received and the reason for the missing manifest copy. If it has not been received within 60 days of the date the waste was accepted by the initial transporter, submit a legible copy of the manifest, with some indication that you have not received confirmation of delivery (Exception Report) to ADEM.

4. Personnel that sign the hazardous waste manifest must be trained per the requirements of 49 CFR 172.204(a)(2) and 40 CFR 262. Their signature certifies that the materials are properly classified, described, packaged, marked, and labeled, and in proper condition for transporting.

APPENDIX A
HAZARDOUS WASTE DETERMINATION

Reference: http://www.adem.state.al.us/programs/land/landforms/HWTrainingFactSheet.pdf

For assistance in the identification and the disposal of hazardous wastes, please contact the EHS Department.

Regardless of the amount of hazardous waste generated, state and federal environmental regulations require every facility to test or use knowledge of its materials and processes to determine if its waste is a listed hazardous waste or exhibits one of the four hazardous characteristics (i.e., ignitability, corrosivity, reactivity, toxicity). This process is called making a hazardous waste determination. To determine whether a material is a hazardous waste, a facility must answer several questions about each waste stream:

1. Is material a "solid waste", as defined by the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) regulations? The regulatory framework for distinguishing solid and hazardous waste can be found at ADEM Admin. Code r. 335-14-2-.01(2) and 335-14-2-.01(3).

A "solid" waste can be a liquid or a contained gas. A material is considered a solid waste if it:

- Is a solid, semi-solid, liquid, or contained gaseous material which is discarded or has served its intended purpose
- Is abandoned
- Is being recycled by being placed on the ground (and that is not the normal use), burned for energy recovery, reclaimed, or accumulated more than one year. o Is inherently waste-like (e.g., dioxin wastes)

If the material in question meets any of the provisions above, you may have a solid waste. If you answered NO to all of the above provisions, you do not have a solid waste.

2. Excluded from AHWMMA Solid Waste Definition, as listed in ADEM Admin. Code r. 335-14-2-.01(4)?

ADEM grants specific exclusions from some hazardous waste regulations if certain conditions are met. Some materials are excluded from the definition of solid waste, while some solid wastes are excluded from the definition of hazardous waste.

See ADEM Admin Code r. 335-14-2-.01(4) for a complete list of those wastes exempt from hazardous waste regulation. Furthermore, if the waste is listed below, that does not mean it is automatically exempt. Each exemption above is conditional and facility managers should review applicable sections of ADEM Admin Code r. 335-14-2 and contact the State's hazardous waste program for clarification on exemptions.

Some materials that are excluded from the definition of solid waste (and therefore are NOT hazardous) include:

- Domestic sewage
- Processed scrap metal
- Used oil filters, properly drained
- Irrigation return flow
- Radioactive waste
- Household waste

3. Is it a "listed" hazardous waste?

ADEM "lists" hazardous wastes that fall into four categories;

- F-listed wastes: The F list includes wastes from common industrial processes. Because they are not specific to one type of industry, they are called wastes from non-specific sources. For example, this list includes many types of spent (or used) solvents. See ADEM Admin Code r. 335-14-2-.04(2) to see if your waste is F-listed.

- K-listed wastes: The K list includes wastes from specific industrial processes, such as wood preservation, organic chemical production, and pesticide manufacturing. See ADEM Admin Code r. 335-14-2-.04(3) for the complete list of manufacturing process wastes to see if your facility might have a K-listed waste.

- P- and U-listed wastes: These two lists designate certain commercial chemical products as hazardous when disposed of unused. These unused chemicals may become wastes in a number of ways. Some can be spilled while in use while others can be intentionally discarded if out of specification. For a waste to qualify as a P- or U-listed waste, it must meet all three of the following criteria:
    - The formulation must contain at least one chemical on the P or U list
    - The chemical in the waste must be unused
    - The chemical in the waste must be in the form of a CCP. *A CCP is a chemical that is of technical (commercial) grade, 100% pure, and the only active ingredient in the formulation. 10 There are hundreds of P- and U-listed wastes. See ADEM Admin. Code r. 335-14-2-.04(4) to see if chemicals present on-site are hazardous if disposed of unused. Please note that the chemicals with the "P" code are acutely hazardous. Generators with acutely hazardous waste are subject to different accumulation limits for those wastes.

4. Is it a characteristic waste?

If a material exhibits at least one of these 4 characteristics below, it is classified as a hazardous waste.

- IGNITABILITY A substance is ignitable if it displays any of the following properties.
    - A liquid with a flashpoint of less than 60° C (140° F);
    - A non-liquid that is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture, or spontaneous chemical changes, and when ignited, burns so vigorously and persistently that it creates a hazard;
    - An ignitable compressed gas;
    - An oxidizer (such as a chlorate or peroxide). Details on the ignitability characteristic are included in ADEM Admin Code r. 335-14-2-.03(2).

- CORROSIVITY
  A substance is corrosive if it displays any of the following properties:
    - An aqueous material with a pH less than or equal to 2 or greater than or equal to 12.5;
    - A liquid that corrodes steel at a rate of at least 0.25 inches per year at 55° C (130° F); NOTE: A waste that is not aqueous and contains no liquid falls outside the definition of ADEM corrosivity. Details on the corrosivity characteristic are included in ADEM Admin Code r. 335-14-2-.03(3).

- REACTIVITY
  A substance is reactive if it displays any of the following properties:
  - Normally unstable and readily undergoes violent change without detonating;
  - Reacts violently with water;
  - Forms potentially explosive mixtures with water;
  - A cyanide or sulfide bearing waste which can generate fumes in a quantity sufficient to present a danger to human health.
  - Capable of detonation;
  - A forbidden explosive, or a Class A or Class B explosive, as defined in Department of Transportation regulations in 49 CFR Part 173. Details on the reactivity characteristic are included in ADEM Admin Code r. 335-14-2-.03(4).

- TOXICITY
  A substance is toxic if it exceeds the concentrations for contaminants listed in the "Maximum Concentration of Contaminants for the Toxicity Characteristic" table, presented in ADEM Admin Code r. 335-14-2-.03(5). A specific test, the Toxicity Characteristic Leaching Procedure (TCLP) must be conducted to determine if the waste is classified as toxic. Details on the toxicity characteristic are included in ADEM Admin Code r. 335-14-2-.03(5).

5. Is Solid Waste Subject to the Mixture Rule?

Waste could become a hazardous waste if mixed with materials classified as hazardous. The next step is to determine if your waste is a mixture of a solid waste and a hazardous waste.

- The "Mixture Rule" states that mixtures of solid waste and listed hazardous waste must be regulated as hazardous waste. There are two ways to determine if a material is regulated under the mixture rule:
  - If the material is a mixture of a solid waste and a hazardous waste, and the mixture exhibits one or more of the characteristics of hazardous waste;
  - If the material is a mixture of a solid waste and a listed waste. The mixture rule is intended to discourage generators from mixing waste streams. More information can be reviewed at ADEM Admin Code r. 335-14-1-.02 and ADEM Admin Code r. 335-14-2-.01(3)(a)2(iv).

6. Is Your Solid Waste Subject to the Derived-From Rule?

Hazardous waste treatment, storage, and disposal processes often generate residues that may contain high concentrations of hazardous constituents. The derived-from rule governs the regulatory status of such waste residues.

- According to the Rule, any solid waste derived from the treatment, storage, or disposal of a hazardous waste is considered hazardous. "Derived from" wastes include sludges, spill residue, ash, emission control dust, and leachate. This principle applies regardless of the actual risk to human or environmental health. More details about the "derived-from" rule and exemptions to the rule are included in ADEM Admin Code r. 335-14-2-.01(3) c and d.

APPENDIX B

Guide to Laboratory Sink/Sewer Disposal of Wastes

Laboratory drains on Campus are connected to the City of Florence's Publicly Owned Treatment Works (POTW), i.e. sanitary sewer. The following guidelines were prepared in conjunction with the City of Florence POTW.

ACCEPTABLE SUBSTANCES FOR DRAIN DISPOSAL

There are a limited number of substances acceptable for drain disposal, providing the solution does not contain material otherwise prohibited. These substances include:

- Chemicals that are water soluble and not hazardous by definition.
- Aqueous solutions:
  - such as salts or buffer solutions within the pH range of 5.0 to 11.5.
  - with a flashpoint greater than 140 F (60 C).
  - containing alcohols at a concentration of 20% weight or less.
- Small quantities of acids or bases within the pH range of 5.0 to 11.5.
- Biological liquids that have been treated with disinfectant.
- Buffer solutions containing less than 10 µg/ml of ethidium bromide.

PROHIBITED DISCHARGE SUBSTANCES

The following substances and general categories of chemicals are prohibited from sink or drain disposal:

- Aqueous solutions containing Formalin
- Organic Solvents
- Brominated Hydrocarbons
- Chlorinated Hydrocarbons
- Chlorofluorocarbons
- Radioactive Materials
- Oil and Grease (petroleum, vegetable, mineral, wax, fats, etc.)
- Heavy Metals (Arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, etc.)
- Cyanides
- Solid or Viscous Waste
- Unused or 'Pure' Chemicals
- Hot Liquid or Vapor Waste
- Nuisance Chemicals (cause odors or discoloration)
- Ethidium Bromide or Acrylamide
- Hazardous wastes:
  - Ignitable
  - Corrosive
  - Reactive
  - Toxic
  - EPA-listed

REFERENCES:

- Prudent Practices in the Laboratory: Handling and Disposal of Chemicals, National Academy Press, Washington, D.C., 1995.
- Safety in Academic Chemistry Laboratories, 8th Edition, American Chemical Society, 2017.

APPENDIX C
HAZARDOUS WASTE GENERATORS

Generator Type	Generation Rate and Requirements
Large Quantity Generator (LQG) 40 CFR 262	• Generate ≥1,000 kg/month of hazardous waste, >1 kg/month of acute* hazardous waste, >100 kg/month of acute spill residue or soil • May only accumulate waste on-site for 90 days. Certain exceptions apply. • Do not have a limit on the amount of hazardous waste accumulated on-site. • Hazardous waste generated must be managed in tanks, containers, drip pads or containment buildings subject to the requirements found at 40 CFR sections 262.17(a)(1)-(4) and, specifically for drip pads and containment buildings, 40 CFR part 265, subparts W and DD, respectively. • Must comply with the hazardous waste manifest requirements at 40 CFR part 262 subpart B and the pre-transport requirements at 40 CFR sections 262.30 through 262.33. • Must comply with the preparedness, prevention and emergency procedure requirements at 40 CFR part 262 subpart M and the land disposal restriction requirements at 40 CFR part 268. • Must submit a biennial hazardous waste report.
Small Quantity Generators 40 CFR 262	• Generate between 100 - 1,000 kg/month of hazardous waste, < 1 kg/month of acute* hazardous waste. • May accumulate hazardous waste on-site for 180 days without a permit (or 270 days if shipping a distance greater than 200 miles). • The quantity of hazardous on-site waste must never exceed 6,000 kg. • Must comply with the hazardous waste manifest requirements at 40 CFR part 262, subpart B and the pre-transport requirements at 40 CFR sections 262.30 through 262.33. • Must comply with the preparedness and prevention requirements at 40 CFR sections 262.16(b)(8) and (9), and the land disposal restriction requirements at 40 CFR part 268. • There must always be at least one employee available to respond to an emergency. This employee is the emergency coordinator responsible for coordinating all emergency response measures.
Very Small Quantity Generators (VSQG) 40 CFR 262.14	• Must identify all the hazardous waste generated. • Generate ≤100 kg/month of hazardous waste ≤1 kg/month of acute* hazardous waste ≤100 kg/month of acute spill residue or soil • May not accumulate more than 1,000 kg of hazardous waste at any time. • Must ensure that hazardous waste is delivered to a person or facility who is authorized to manage it.

*The following wastes are considered acutely hazardous waste: any "P" listed wastes, and dioxin wastes with the following EPA hazardous waste numbers: F020, F021, F022, F023, F026 and F027.

APPENDIX D
TRANSPORTATION OF HAZARDOUS WASTES

Packaging and Labeling

- The selection of proper packaging and labels is determined by the shipping name of the chemical (49 CFR 172.101). Labels must conform to DOT specifications as to durability, size, design and color.

- Materials and wastes with subsidiary hazards must have a label for each hazard class that the materials exhibit.

- Labeling requirements for shipping lab packs that are made up of many smaller containers inside a large container (consolidated packaging) are given in 49 CFR 172.402.

- EPA and DOT require these words to appear on the containers:

    - *HAZARDOUS WASTES—Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.*

    - Generator's Name and Address

    - Manifest Document Number

    - The marking should also include the proper shipping name preceded by the word "WASTE" and the DOT ID Number.