

6. Ensure the university is making an effort to minimize the amounts of hazardous waste generated on campus.

b.

- iii. The waste's generator, utilizing some outside source of information, (Safety Data Sheet or Material Safety Data Sheet (SDS or MSDS), manufacturer's website, etc.) determines that the waste should be treated as hazardous.

Listed Hazardous Wastes

- a. The EPA has published [four lists](#) (F-list, K-list, P-list, or U-list) identifying hazardous wastes. Appendices 'A' and 'B' are a composite of approximately 850 chemicals that are recognized by the EPA and EHS as hazardous.
- b. Acutely toxic hazardous wastes, also called "P-listed" wastes, comprise Appendix 'A'. Any container that once held a

EPA Characteristic Hazardous Wastes 40 CFR Part 261 Subpart C

- a. A waste is hazardous if it exhibits any one of the four characteristics of a hazardous waste. The following are the [four characteristics](#) and a few examples of common wastes at the University:
 - i. Ignitable
 1. Flammable Liquids- Flashpoint $<140^{\circ}$ F
 - a. Examples: Alcohols, Benzene, Toluene, Xylene, Acetonitrile
 2. Oxidizers
 - a. Examples: Nitrates, Perchlorates, Bromates, Permanganates, Peroxides, Periodates
 3. Organic Peroxides:
 - a. Examples: Benzoyl Peroxide, Cumene Hydroperoxide, Methyl Ethyl Ketone Peroxide
 2. Corrosive - Aqueous liquids with $\text{pH} \leq 2$ or $\text{pH} \geq 12.5$
 1. Inorganic Acids
 - a. Examples: Hydrochloric Acid, Sulfuric Acid, Nitric Acid, Phosphoric Acid
 2. Organic Acids
 - a. Examples: Formic Acid, Lactic Acid, Acetic Acid
 3. Bases
 - a. Examples: Hydroxide solutions, Amines
 3. Reactive - materials which can react violently with water, create toxic and /or flammable

- a. Containers
 - i. All containers must be leak-proof and chemically compatible with their contents. Lids should fit properly so that the container is leak-proof.
 - ii. When selecting a waste container, pay attention to the original container material to ensure waste added to the container is not incompatible with residues of the original material. It is vital that chemical waste be compatible with its container. If the waste is placed in an inappropriate container, the container might disintegrate or rupture.
 - iii. Bags may be used only for dry solids. Needles (capped or uncapped), pipettes, broken glass or other sharp-edged materials that are chemically contaminated are not acceptable in bags. All "sharps" must be placed in puncture-resistant containers.
 - iv. Containers which show signs of contamination on their exterior are not acceptable regardless of their contents. EHS must take every step available to protect its staff from potential chemical hazards.
 - v. If a waste has biological and/ or radiological and chemical hazards, please contact EHS for guidance before packaging. Containers and bags marked with
cannot be used for chemical waste disposal.
 - vi. Minimize void space in containers by assuring that collection containers should be filled to capacity (with

- a. Any container used for disposal and storage of waste must be marked with the information specified in the Labeling section immediately upon placing the first drop of waste into the container.
- b. Whenever possible, store flammable waste liquids and waste corrosive liquids in cabinets designed for these materials.
- c. The maximum amount of hazardous waste that can be accumulated in the lab is 55 gallons of hazardous waste or 1 kilogram of acutely toxic (P-listed) waste (Appendix 'A'). If you accumulate more than the maximum amount of hazardous waste (55 gallons of hazardous waste or 1 kilogram of acutely toxic (P-listed) waste), the waste needs to be removed from your lab no later than 3 days after these maximum amounts are reached. The waste must be moved to a Central Accumulation and waste corr

unknown wastes, since characterization of unknown wastes significantly increases the cost for disposal. To have unknowns picked up; place a _____ on the container with the word _____ in the chemical constituent's area. Add the unknown to your _____

- ii. Pharmaceutical Waste - There are many chemical and/or pharmaceutical compounds that are used in research or in the treatment of diseases that are also considered hazardous wastes by the EPA when disposed of. Call EHS (372-3524) for further guidance.
- iii. Gas Cylinders - Generators should attempt to establish accounts with suppliers who will allow the return of unused product and empty cylinders. If possible, the entire contents of the cylinder should be used up. Generators must ensure that aging cylinders are picked up by the supplier before the integrity of the valve and cylinder is compromised. A compressed gas cylinder safety Standard Operating Procedure is available on the EHS website (

P044 60-51-5 Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
P043 55-91-4 Phosphorofluoridic acid, bis-(1-methylethyl) ester
P089 56-38-2 Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester
P040 297-92-2 Phosphorodithioic acid, O,O-diethyl O-pyrazinyl ester
P097 52-85-7 Phosphorodithioic acid, O-O,4 [(diimethylamino)sulfonyl]phenyl]O,O-dimethyl ester
P071 296-00-0 Phosphorodithioic acid, O,O-dimethyl O-(4-nitrophenyl)ester
P110 78-00-2 Plumbane, tetraethyl-
P098 151-50-8 Potassium cyanide
P099 506-61-6 Potassium silver cyanide

P123 8001-35

Toxaphene	8001-35-2
Trichloroethylene	79-01-6
2,4,5-Trichlorophenol	95-95-4
2,4,6-Trichlorophenol	88-06-2
2,4,5-TP (Silvex)	93-72-1
Vinyl chloride	75-01-4

Please review the following requirements to ensure that you comply with environmental regulations and safe handling procedures for hazardous waste. _____

1. For disposal of hazardous waste please submit a form: Filled or unwanted waste must be removed from the satellite area within three days so it is important that you contact us once your container(s) are filled or ready for removal.

Containers must be compatible with the hazardous waste being accumulated. Hazardous waste containers must be closed at all times during storage, except when waste is being added or removed. Regulations do not permit funnels in waste containers unless it is being filled. The maximum size allowed for containers is 55 gallons for hazardous waste and one quart for acutely hazardous waste.

3. All hazardous waste containers must be labeled at the time the waste is first placed into the container. Please call EHS at 372-3524 if you need labels.

4. For safety and environmental reasons, hazardous waste must be stored in a designated "Satellite Accumulation Area", (e.g. flammable storage cabinet, bench top). These must be located at or near the point of generation. Storage areas that could result in a leak into a sink or floor drain must have secondary containment to guard against this. Designated "Satellite Accumulations Areas" must be inspected _____ for leakage and compliance with these requirements.

5. _____ must be documented. The documentation requires initials and the date of inspection for each SAA.

6. _____ waste and _____ waste must not be mixed with or stored in the same

It is the responsibility of each Laboratory Manager or Principle Investigator (PI) to ensure that all personnel who work with generate, or otherwise come into contact with Hazardous Waste receives adequate familiarization training on the requirements which this manual covers. Each worker must thoroughly understand the rules and regulations associated with Hazardous Waste before any duties requiring them to come into contact with such materials are assigned to them.

This sheet is to be maintained in the laboratory by the lab's Manager or PI, and provided upon request.

