What is a Hazardous Waste?

Before the term hazardous waste is defined we must:

1. Identify what is a solid waste.
2. Understand the regulatory concept of discarded material.

"Solid Waste" is defined in 40 CFR 261.2

The simple version is

"Any material or combination of materials of a solid, liquid, contained gaseous or semi-solid form that is discarded."

"Discarded" is defined in 40 CFR 261.2(a)(2)(i)(A),(B),(C)&(D)

The simple version is

Any material is "abandoned," "recycled", inherently "waste-like", or military munition that has not been exempted from hazardous waste regulations"

"Hazardous Waste" is defined in 40 CFR 261.3.

The simple version is

"Any solid waste that exhibits a hazardous "characteristic" or is a "listed" solid waste."

Characteristic Waste

There are four hazardous waste characteristics: ignitability, corrosivity, reactivity and toxicity. Generators may use testing or knowledge to determine if their waste stream exhibits one or more of the characteristics. The definitions or each characteristic are given below:

- ***Ignitability (40 CFR 261.21)*** – Ignitable wastes, denoted by the code **D001** are generally liquids with flash points below 60°C or 140°F. Non-chlorinated solvent wastes are usually ignitable wastes. A non-liquid hazardous waste is considered ignitable if it is capable of causing fire through friction, adsorption of moisture or spontaneous chemical change and burns in a manner that creates a hazard.

- ***Corrosivity (40 CFR 261.22)*** – Corrosive wastes, denoted by the code **D002**, are generally aqueous solutions with a pH of 2 or less or of 12.5 or greater.

- ***Reactivity (40 CFR 261.23)*** – Reactive wastes, denoted by the code **D003**, are those wastes that are generally unstable, explosive, capable of detonation when heated under confinement, or react violently with water. Also wastes are reactive if they generate a toxic cyanide or sulfide fumes when subject to pH between 2 and 12.5.

- ***Toxic Wastes (40 CFR 261.24)*** – Toxic wastes, denoted by the codes **D004** to **D043**, are certain wastes containing regulated constituents that exhibit toxic properties as defined by the Toxicity Characteristic Leaching Procedure (TCLP). TCLP identifies wastes that are likely to leach hazardous concentrations of regulated constituents under simulated landfill conditions. Those wastes that fail the TCLP for metals or organic compounds are assigned that appropriate waste code.

Listed Waste

There are four lists of hazardous wastes. To determine if a waste is listed, one must have knowledge of the waste's origin. The lists are described briefly below, but complete copies of the hazardous waste lists are included in 40 CFR 261.

- ***F-List [40 CFR 261.31]*** - The F-list (**F001-F039**), frequently referred to as the non-specific source list, contains spent solvents, electroplating wastes, wastes related to the production or treatment of chlorinated hydrocarbons, wood preserving wastes, and certain landfill leachates. Spent solvents on the F-list are designated by the codes **F001, F002, F003, F004** and **F005**. The **F001** code only applies to certain chlorinated solvents used in degreasing operations. Spent solvents are represented by the codes **F002** through **F005**. Often, laboratories generate F-listed spent solvents. For example, in an organic prep lab, listed solvents such as methylene chloride and carbon disulfide are used in the extraction processes: methylene chloride wastes (e.g., waste extracts) are denoted by the code **F002**, and carbon disulfide wastes are denoted by the code **F005**. Note that there is a special "ignitability" provision for some of these wastes. This provision states that if an F-listed waste was originally listed for ignitability (solely), and that waste is no longer ignitable, then the waste is no longer a listed hazardous waste.

- ***K-List [40 CFR 261.32]*** - The K-list, frequently referred to as the specific source list, contains solid hazardous wastes from certain industries including, but not limited to, chemical manufacturing, ink formulating, petroleum refineries and metal smelting. Laboratories may generate K-listed waste if they accept waste samples from a K-listed industrial process. ***Lincoln University does not accept any material of this type so this is for information purposes only.***

  P-List [40 CFR 261.33(e)] - The P-list applies to unused, discarded, commercial chemical products with a sole-active ingredient on the P-list. In laboratories, the P-list is often assigned to expired chemicals or unused chemicals that are thought to be contaminated. For example, a container of carbon disulfide, that for some reason is thought to be contaminated, would be disposed of as P022 waste. The P-list can also be applied to discarded chemical solutions that were made in the laboratory in lieu of purchasing a commercial product. For example, excess (e.g., unused) Aldrin standard that was prepared in the laboratory (e.g., in methanol) would be disposed of as P004 waste if Aldrin was the sole-active ingredient (methanol is not "active" in this case). The P-list is not applied to waste standards with several active ingredients (e.g., a mixed pesticide standard), but only to waste standards with a sole-active ingredient. P-listed wastes are acutely hazardous wastes. To avoid generation of unnecessary quantities of P-listed waste, all P-listed waste should be segregated from other hazardous waste. ***Special attention will be paid to any wastes in this category since only 1 quart of a p-listed waste can be accumulated in a satellite accumulation area at any one time. Also note that if a generator produces >1kg/month of P-listed waste they must register as a large quantity generator. Containers that previously held P-listed wastes mus also be triple rinsed to meet RCRA empty standards. Currently there are no known P-listed wasted generated on campus at Lincoln University.***

- ***U-List [40 CFR 261.33(f)]*** - The U-list applies to unused, discarded, commercial chemical products that contain a sole-active ingredient that appears on the U-list. In laboratories, the U-list is often assigned to expired chemicals or unused chemicals that are thought to be contaminated. For example, a container of methylene chloride, that for some reason is thought to be contaminated, would be disposed of as U080 waste. [Note: Actually

dichloromethane, not its synonym methylene chloride appears on the U-list. When reviewing the P- and U-lists, one must carefully check for synonyms.] Unlike the P-list, which have been identified as acute hazardous wastes, the U-listed wastes have been identified as toxic wastes.

If you have any questions or need a waste determination performed please contact Robert Clay, Hazardous Materials Officer at 681-5497 or clayr2@lincolnu.edu

Reference Guidance

Waste Determination Guidance EPA
http://www.epa.gov/wastes/inforesources/pubs/hotline/training/hwid05.pdf

Characteristic Wastes
http://www.epa.gov/wastes/hazard/wastetypes/wasteid/char/hw-char.pdf

EPA Powerpoint Presentation
http://www.epa.gov/wastes/hazard/correctiveaction/curriculum/download/hwid-char.ppt

Listed Wastes
http://www.epa.gov/wastes/hazard/wastetypes/pdfs/listing-ref.pdf

EPA Powerpoint Presentation
http://www.epa.gov/wastes/hazard/correctiveaction/curriculum/download/hwid-list.ppt

EPA Environmental Management Guide for Small Laboratory

http://www.epa.gov/region04/ead/news/pdf/handout.pdf