Hazardous Waste Training

Department of Lab Medicine

March 2019

Training Agenda

- Overview
- Purpose
- Hazardous Waste Management
- Questions
- Quiz

YNHH Waste Overview

- YNHH generates many different types of wastes:
  - Pharmaceutical wastes
  - Chemical wastes
  - Waste fluorescent bulbs
  - Used Batteries
  - Sharps
  - Radioactive waste
  - Patient care wastes
  - General solid waste (paper, food wastes, etc).
- Most of these wastes have specific management requirements under state and federal law.

Purpose of this Training

- This training will provide you with information about how hazardous wastes are generated at YNHH, and how these wastes must be managed.
- At the end of this session, personnel who perform waste related activities should understand the proper waste management procedures and requirements relevant to their positions and duties.

Hazardous Waste Training

Who Should be Trained?

- Any personnel who perform waste related activities, such as:
  - Responsible for complying with applicable regulations
  - Generating/handling/collecting hazardous waste
  - Inspecting storage areas
  - Responding to emergencies
  - Signing Manifests

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When must training be conducted?

- Within 6 months of date of hire or assignment to new position
- **Annual** refresher training
- Employees must not work in unsupervised positions until they have completed the training requirements

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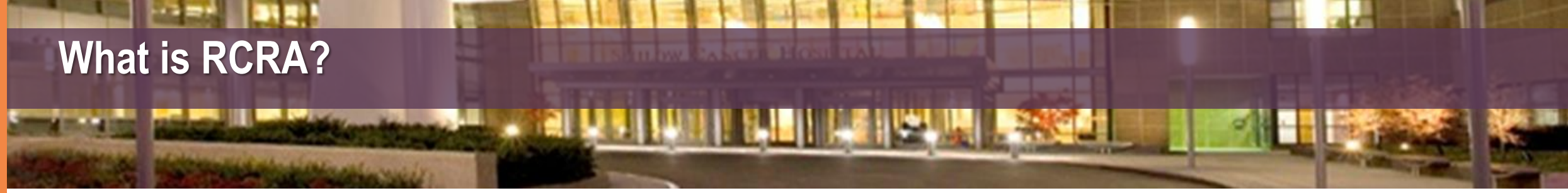

What is RCRA?

Resource

Conservation &

Recovery

Act

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What is RCRA?

- Governs management and tracking of hazardous waste from generation to ultimate disposal ("cradle to grave")
- RCRA's three primary goals are to:
  - Protect human health and the environment through effective waste management
  - Conserve materials and resources through waste recycling and recovery
  - Reduce or eliminate waste generation as expeditiously as possible

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What is Hazardous Waste?

- Any solid waste not specifically exempted, and:
  - meets 1 of 4 specific characteristics, or
  - is identified in 1 of 4 specific lists
- Examples – expired pharmaceuticals, waste chemicals (e.g., acetone, alcohols), paint thinners, expired chemicals, old lead aprons

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EPA Identification Number

- A generator must not treat, store, dispose of, transport, or offer for transportation, hazardous waste without having received an EPA identification number
- YNHH – York Street Campus's EPA ID Number is CTD075406561
- YNHH – St. Raphael Campus' EPA ID Number is CTD075406579

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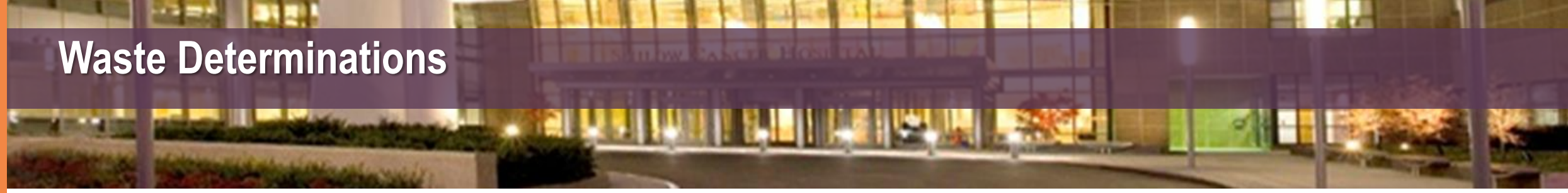
Waste Determinations



- Hazardous waste generators must determine if solid wastes they generate are hazardous by:
  - Applying knowledge of the composition or hazardous characteristic of the waste based on materials and process used; or
  - Sampling and analyzing the waste using specified EPA test methods or equivalent methods.
- Any time a new waste is generated, it must be characterized.
- In Connecticut, hazardous waste determination records must be maintained, and updated **at least once every 12 months**.

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Two Types of Hazardous Waste

- "Characteristic" Hazardous Wastes
- "Listed" Hazardous Wastes

All hazardous waste is assigned at least one "waste code." Applicable waste codes must appear on the hazardous waste manifest when the material is transported off site. Throughout this training presentation you will see examples of waste codes for the different types of hazardous wastes (e.g., D001, F002, U154, etc.).

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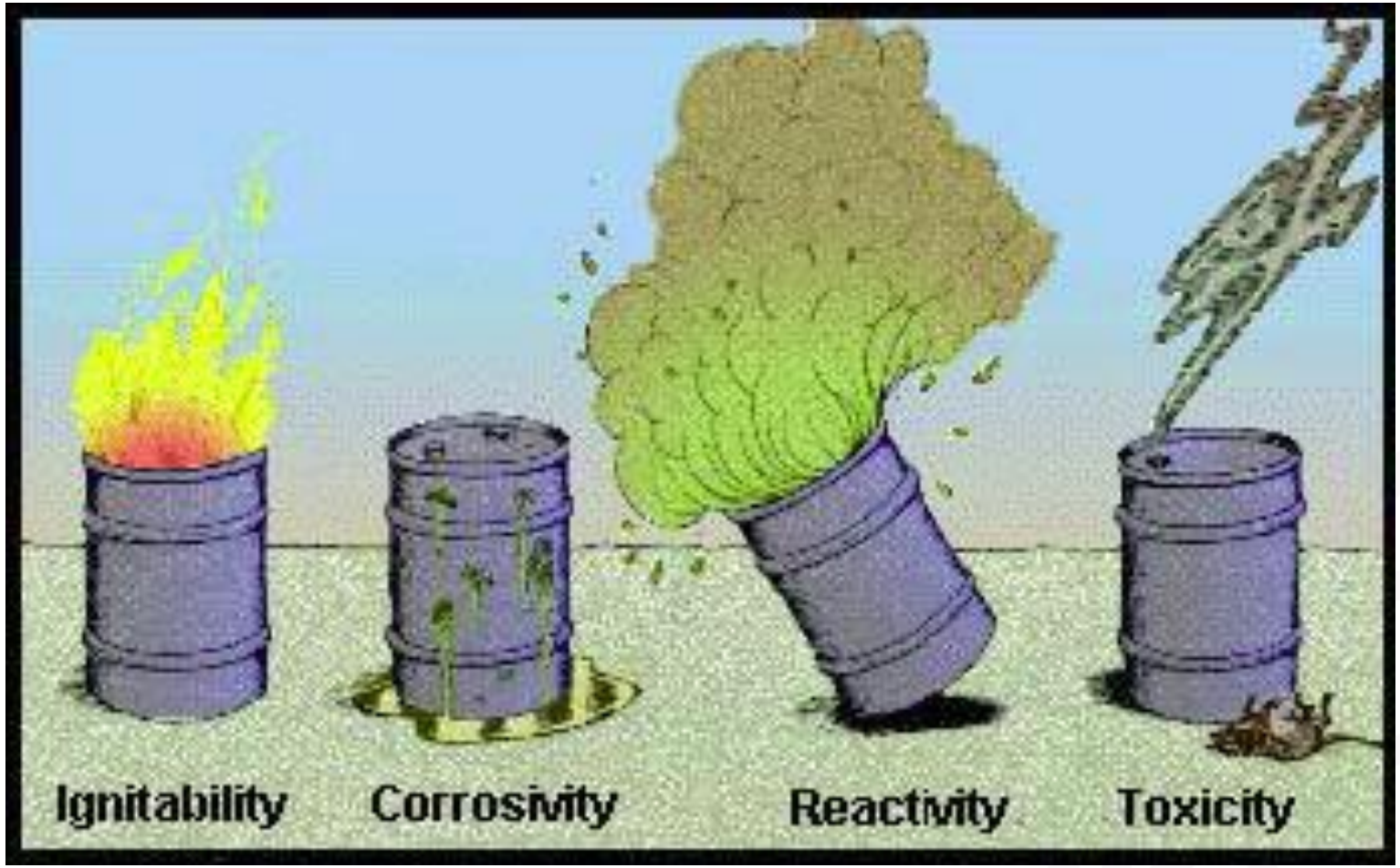
"Characteristic" Hazardous Waste

- The four hazardous characteristics:



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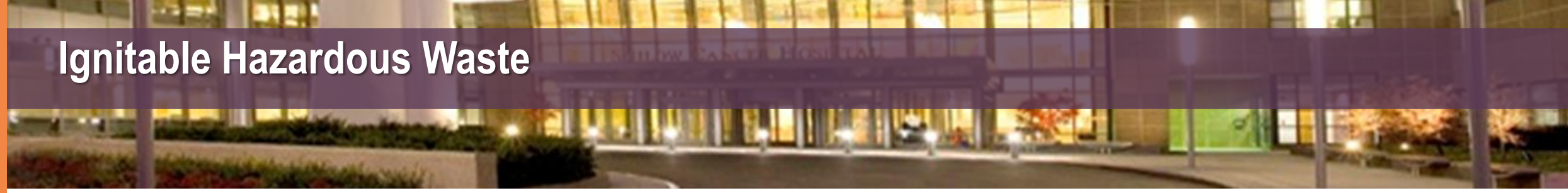
Ignitable Hazardous Waste



- Liquid, other than aqueous solution containing <24% v/v alcohol, with flash point less than 140°F or 60°C.
- Solids capable of spontaneous combustion under normal temperature and pressure.
- Ignitable compressed gases.
- Oxidizers (e.g., chlorate, permanganate).
- Waste Code **D001**

  Examples: alcohols, acetic acid, stains, destains, paint, solvents and solvent mixtures, kerosene, paint thinner, mineral spirits, partially full aerosol cans.

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Ignitable Hazardous Waste (cont'd)

- Partially full aerosol cans are regulated as hazardous waste if they have **ANY** pressure left inside.
- Empty aerosol cans could potentially be reactive hazardous waste due to propellant.

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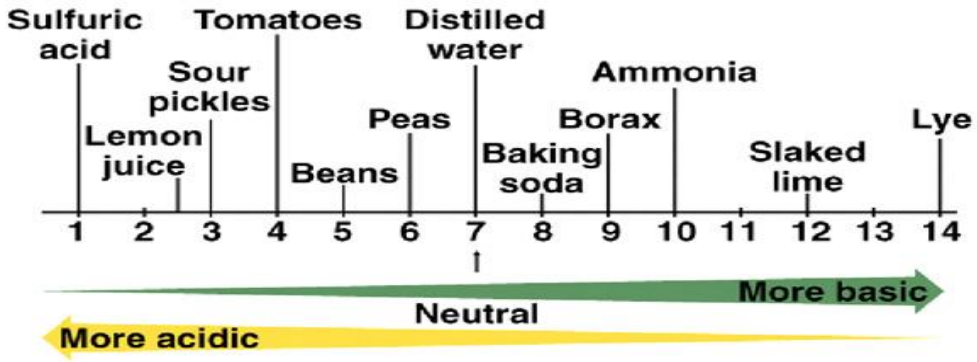
Corrosive Hazardous Waste

- Liquid and aqueous solutions with pH less than or equal to 2.0 or greater than or equal to 12.5.
- Waste Code **D002**

  Examples: acids, bases, hydroxides, waste boiler treatment chemicals.



Reactive Hazardous Waste

- Reacts violently with water.
- Generates toxic gases or fumes.
- Explosives.

Waste Code **D003**

Examples: cyanide; sodium explosives; lithium batteries (with electrical charge; and certain acids (picric acid).

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Toxic Hazardous Waste

- Waste displays the toxicity characteristic if it contains a specifically listed chemical above designated concentration levels using specified test methods.
- The toxicity characteristic leaching procedure (TCLP) is the test method to determine if a waste is toxic hazardous waste.

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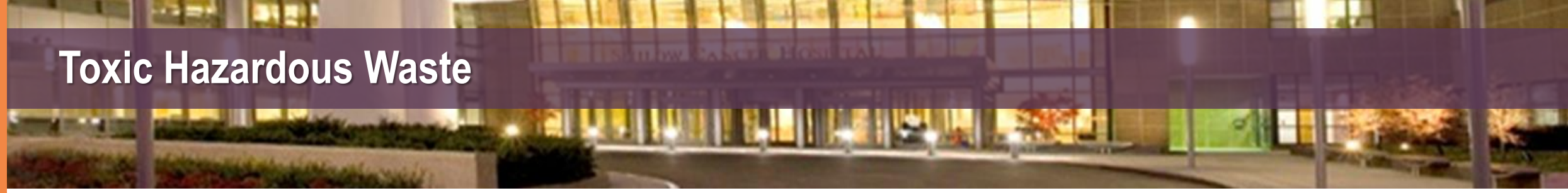
Toxic Hazardous Waste



NOTE: The 8 compounds that appear in boldface are referred to as the "RCRA 8 metals" and are among the most common toxic wastes generated at YNHH

Material	Regulatory Limit	Waste Code
Arsenic	**5.0 ppm**	**D004**
Barium	**100 ppm**	**D005**
Benzene	0.5 ppm	D018
Cadmium	**1.0 ppm**	**D006**
Chloroform	6.0 ppm	D022
Chromium	**5.0 ppm**	**D007**
Lead	**5.0 ppm**	**D008**

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Toxic Hazardous Waste (cont.)

Material	Regulatory Limit	Waste Code
Mercury	**0.2 ppm**	**D009**
Methyl Ethyl Ketone	200 ppm	D035
Selenium	**1.0 ppm**	**D010**
Silver	**5.0 ppm**	**D011**
Tetrachloroethylene	0.7 ppm	D039
Trichloroethylene	0.5 ppm	D040
Vinyl Chloride	0.2 ppm	D043
Chloroform	6.0 ppm	D022

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YNHH Characteristic HW

- Ignitability characteristic (D001)
  - Waste paint, solvents, acetone, flexible collodion used in drug formulations, pressurized containers, ignitable compressed gas
- Corrosivity characteristic (D002)
  - Pharmaceutical compounding chemicals such as sodium hydroxide solution
- Reactivity characteristic (D003)
  - Picric acid, nitroglycerine
- Toxicity characteristic (D004 – D043)
  - Arsenic, mercury

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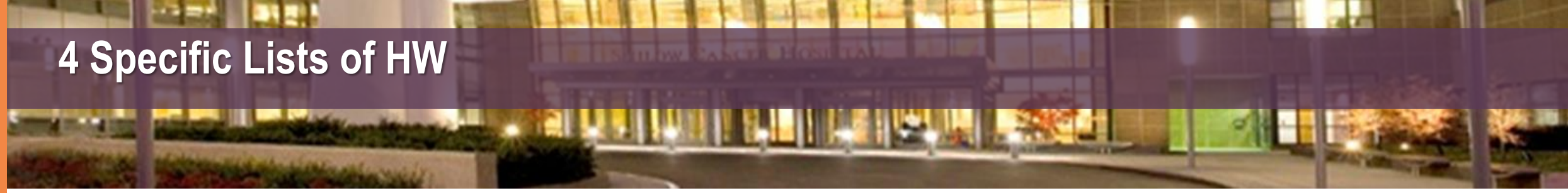

4 Specific Lists of HW

- EPA Waste Code F001-F039
  - Solvents and sludges from non-specific sources
- EPA Waste Code K001-K178
  - Wastewater, sludge, by-products from specific sources
- EPA Waste Code P001-P205
  - Discarded commercial chemical products, off-spec material, container residue from acute hazardous waste, any residue, contaminated soil, water or other debris resulting from the clean-up of a spill
- EPA Waste Code U001-U411
  - Discarded commercial chemical products, off-spec material, container residue from toxic hazardous waste, any residue, contaminated soil, water or other debris resulting from the clean-up of a spill

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YNHH Listed HW

- U-Listed Hazardous Wastes
  - Unused laboratory solvents such as xylene (U239) and methanol (U154); ethylene oxide (U115); waste pharmaceuticals such as lindane (U129) and selenium sulfide (U205)
- P-Listed Hazardous Wastes
  - Arsenic Trioxide (P012); Phenylephrine (P092); nicotine (P075); epinephrine (P042); Warfarin (P001)

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Listed and Characteristic Waste

- A waste can be both a listed and a characteristic hazardous waste.
  - For example, acetone is a U002 listed waste (when it is unused and the sole active ingredient), but it is also a D001 waste for its ignitability characteristic. Acetone is also one of the F003 listed solvents, and carries that code when it is used for its solvent properties and meets the F003 definition.

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Exclusions and Exemptions

- The following materials are not hazardous waste:
  - Household wastes (this does NOT mean you can take YNHH waste home).
  - Scrap metal that is sent off-site for recycling.
  - Residues of hazardous waste in “empty” containers.

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How Empty is "Empty"?

- A container that has held any material that, when disposed of would be either a "Characteristic" or "Listed" hazardous waste is considered empty when:
  1. All of the material that can be removed has been removed using common practices such as pouring, pumping, and scraping.
  2. No more than 1 inch of residue remains in the bottom of the container.
  3. No more than 3% residue in container.

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How Empty is "Empty"?

- If the container held a P-listed constituent, it is not considered "empty" unless the container has been triple rinsed with an appropriate solvent (the resulting rinsate is hazardous [P-listed] waste).
- It may be better to simply dispose of P-listed waste containers rather than triple rinsing.

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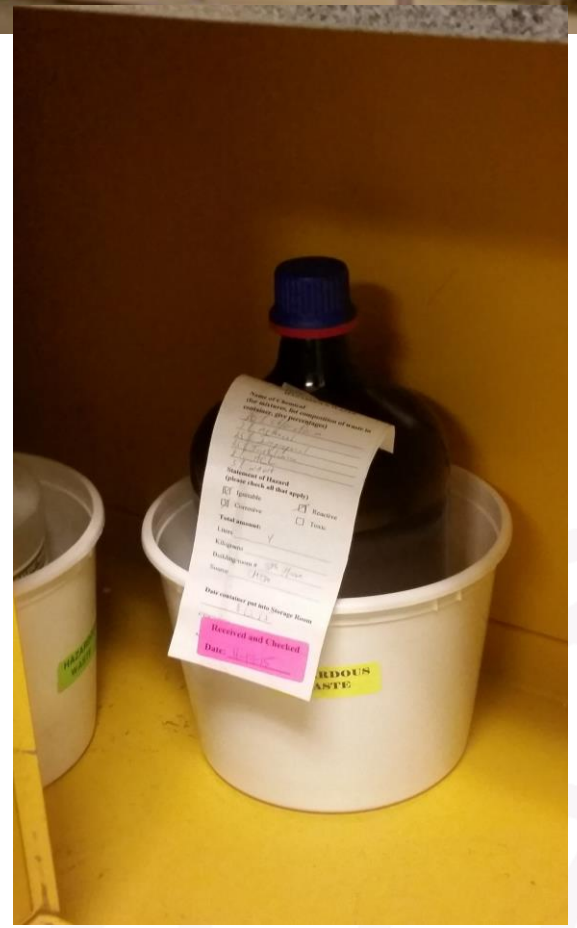
Hazardous Waste Containers

- Hazardous waste containers are located in:
  - Soiled Utility Rooms
  - All Medication rooms/patient care units
  - Procedural rooms
  - Pharmacy
  - Clinical Labs
- Signs are posted in all areas describing what wastes go in what containers
- Containers are moved to the Hazardous Waste Storage Area up by trained Lab personnel.



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Generator Status

If Generate/Mo	Or If Accumulate Onsite	Of	Then You Are
≤100 kg ≤1 kg ≤100 kg	≤1,000 kg ≤1 kg ≤100 kg	Haz Waste Acute Haz Waste (P-Waste) Acute Haz Waste Clean-up	CESQG
<1,000 kg ≤1 kg ≤100 kg	≤1,000 kg ≤1 kg ≤100 kg	Haz Waste Acute Haz Waste (P-Waste) Acute Haz Waste Clean-up	SQG
≥1,000 kg >1 kg >100	>1,000 kg >1 kg >100 kg	Haz Waste Acute Haz Waste (P-Waste) Acute Haz Waste Clean-up	LQG

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Generator Status

- *YNHH – YSC and YNHH – SRC are LQGs*

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Generator Responsibilities

- As a LQG, YNHH must:
  - Obtain an EPA identification number;
  - Evaluate every waste generated to determine if it is hazardous waste;
  - Properly label, store, and manage wastes on-site;
  - Send waste off-site within 90 days of the accumulation start date;
  - Use a licensed hazardous waste transporter to ship hazardous waste off-site;
  - Send all waste under a hazardous waste manifest with an accompanying land disposal restriction form; and
  - Send waste to a licensed, authorized hazardous waste Treatment Storage and Disposal facility.

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Satellite Accumulation Area Waste Management Rules

- LQGs can accumulate up to 55-gallons of hazardous waste or one quart of acute hazardous waste "at or near the point of generation" in "Satellite Accumulation Areas" without regard to the 90-Day Area requirements provided certain requirements are met.

HAZARDOUS WASTE
Satellite Accumulation Area

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SAA Waste Management Requirements

- The waste must be stored in containers that are:
  - In good condition (not leaking, bulging or dented);
  - Compatible with the waste;
  - "Under the control of the operator" of the process generating the waste; and
  - "Closed," except when waste is being added or removed.
- No time limit for ≤ 55 gallons or ≤ 1qt acute
- Cannot store > 55 gallons or 1 quart acute
  - **If > 55 gal/1 qt acute, excess must be labeled, dated, moved to HW Storage area within 72 hrs**

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Some SAA Clarifications

- **"At or near the point of generation"** means in the same room, not across the hall or through a doorway.
- **"Under the control of the operator"** means that the container is not left unattended or is located in a secure area.
- **"Closed"** means that the container can be turned on its side without leaking. Screw caps must be tight. Funnels cannot be left in containers unless they have a locking lid.

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Container Management (SAAs)

- Containers in SAAs must be:
  - Labeled with “Hazardous Waste” and other words that identify the contents
  - In good condition (not leaking, bulging)
  - Compatible with waste
  - Closed except when waste is being added or removed
  - “Closed” means no releases through evaporation and won’t spill if tipped over

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Hazardous Waste Label

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Storage and Transport rules

- The storage area is the on-site location to which the waste is moved when it leaves the SAA. For LQGs, these areas are often referred to as "90-Day Storage Areas."
- Once Hazardous waste is moved from an SAA to a central accumulation area or an SAA reaches a quantity threshold, the storage clock starts ticking.
- YNHH has 90 days from the accumulation start date (the date marked on the label) to transport the waste off site using a licensed hazardous waste transporter.
- The transporter must take the waste from the storage area to a licensed Treatment Storage and Disposal Facility (TSDF).

The Park Street Lab has two storage areas (PS-657 and PS-526) and the SRC Lab has one storage area (the Boom Room).

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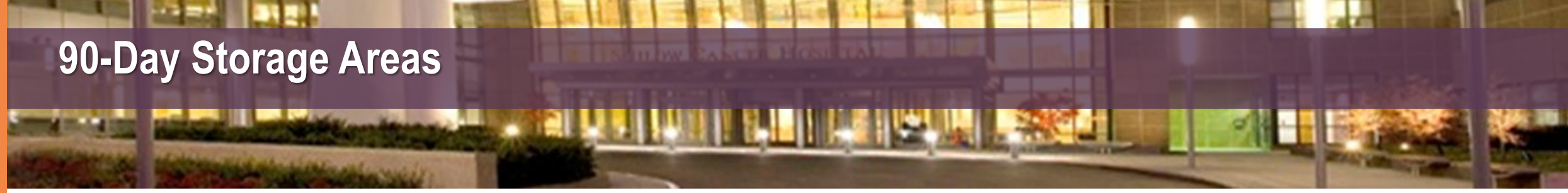
90-Day Storage Areas



- LQGs may store waste on-site without a license, as long as:
  - The storage area is designed to prevent unknowing and unauthorized entry;
  - The area is labeled “Danger – Unauthorized Personnel Keep Out,” “Hazardous Waste” and “No Smoking;”;
  - All hazardous waste is transported off-site within 90 days of the accumulation start date;
  - Containers are stored in a manner that allows access for inspection and remedial action (36-inch access aisles between rows of containers);
  - Ignitable (D001) & reactive (D003) hazardous waste is stored at least 50 ft from property line;
  - Containers are on a firm working surface, impervious to spills; with secondary containment;
  - Inspections are conducted and logged: weekly for hazardous waste containers; daily for loading areas when in use; monthly for emergency equipment; and

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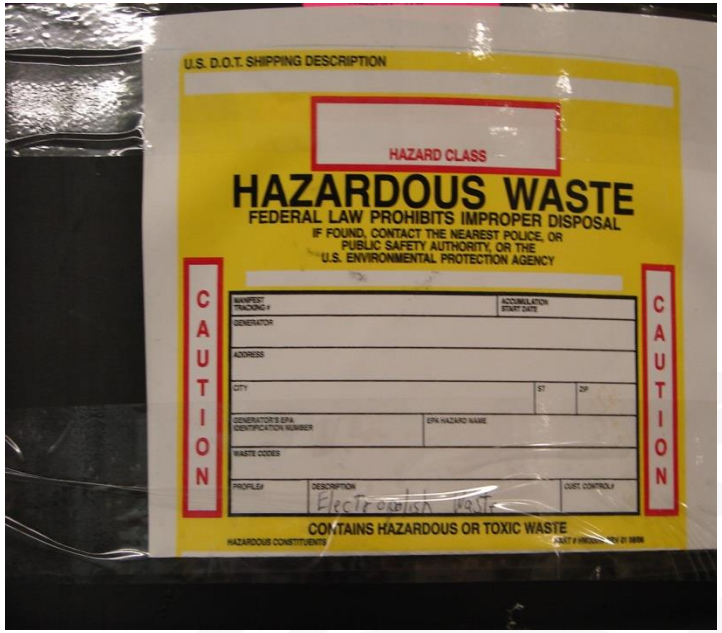
90-Day Storage Areas (cont'd)

- Waste is stored in containers that are in good condition;
- Containers are labeled "Hazardous Waste," other words & marked with an accumulation start date;
- Containers are kept closed except when adding or removing waste; and
- Incompatible wastes are stored separately.
- Have fire fighting and spill control equipment;
- Provide for testing of emergency equipment to ensure proper operation; and
- Maintain adequate aisle space to allow free and unobstructed movement of emergency response and fire equipment.



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Emergency Equipment

- 90-Day hazardous waste storage areas must:
  - Be designed, maintained and operated to minimize the possibility of fire, explosion, and release of hazardous waste;
  - Have an internal communication or alarm system;
  - Have a telephone or some other means of summoning emergency help.

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Hazardous Waste Shipments

- RCRA regulates hazardous waste from “cradle-to-grave” and therefore requires documentation from everyone who handles the waste, from the generator, to the waste hauler, and ultimately the TSDF.
- All waste shipments must be accompanied by a hazardous waste manifest.
- The hazardous waste manifest details the type and quantity of hazardous waste that is shipped and requires signatures from each of these entities.

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The Hazardous Waste Manifest

- YNHH is responsible for properly completing the manifest and must sign the Generator's Certification attesting that the information contained is true and accurate.
- **Only trained and certified YNHH personnel may sign a manifest.**
- YNHH maintains one original copy of the manifest and within 45 days should receive a completed copy of the manifest with all of the required signatures from the TSDF.
- The completed manifest must be maintained on file at YNHH for **three years**.

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Safety and Effective Procedures for Handling Hazardous Waste

Personal Protective Equipment (PPE)

- Eye protection and face protection
  - Safety glasses or goggles
  - Face shield
- Hand Protection
  - Gloves: there are many types of gloves (latex, vinyl, neoprene, etc)
  - To choose the appropriate glove, check a permeation rate table. Permeation rate is the rate at which the test chemical passes through the glove material.
- Protective Clothing
  - Aprons, lab coats, closed-toe shoes

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Emergency Coordinator

- LQGs must appoint an emergency coordinator who is available at all times (either on the premise or on call) to coordinate hazardous waste related emergency response measures.
- **George Pressley, Director of EVS** is the Primary Emergency Coordinator for YNHH.

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Contingency Plan

- LQGs must:
  - Adopt and implement a written **Contingency Plan** and provide it to local police and fire departments, hospitals, and local emergency response teams that may be called upon to provide emergency services; and
  - Ensure the emergency coordinator implements emergency procedures whenever there is an imminent or actual emergency.

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Contingency Plan (cont'd)

- The Contingency Plan must describe:
  - Emergency response actions;
  - Arrangements with emergency responders (police, fire departments, hospitals, and State and local emergency response teams);
  - Up-to-date list of the names, addresses, and phone numbers (office and home) of primary and alternate emergency coordinators;
  - Up-to-date list of all emergency equipment locations, and a description of capabilities; and
  - Evacuation plan.

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Emergency Response Actions

- Hazardous Waste Spill
  - Leave the area immediately and call 155 at YNHH and SRC, 911 at offsite locations
  - Request a First Response Team for [*describe the danger, such as a significant spill or smell of a chemical*]
  - Cordon off the area and prevent anyone from going into the area.
  - Final cleanup/disinfection by outside spill response contractor. YNHH's current contractor for hazardous waste emergencies is Stericycle.

- Fire/Explosion – call 155 at YNHH and SRC, 911 at offsite locations

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Questions?