

Satellite Accumulation Area Training for Hazardous Waste Generators

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The rising STAR of Texas

Who Should Take this Training?

- ❖ All personnel who work in an area where hazardous waste is generated, for example:
 - Facilities personnel
 - Laboratory Principal Investigators and Lab Managers
 - Laboratory Personnel:
 - Staff
 - Student volunteers working in a research lab
 - Industry Partners working in a university lab

Training Objectives

- ❖ Understand the regulations that apply to hazardous waste
- ❖ How to identify a hazardous waste and make a simple waste determination
- ❖ How to manage hazardous waste in your lab or waste management area in compliance with the regulations
- ❖ Learn about special wastes
- ❖ How to request a waste pick up



Hazardous Waste Regulations

- ❖ Resource Conservation and Recovery Act, 1976
 - ensures that hazardous waste is managed safely from the moment it is generated to its final disposal (Cradle-to-Grave).
 - EPA and TCEQ oversee and conduct audits

- ❖ Manage hazardous waste to help comply with our local industrial user wastewater permit.
 - Wastewater generated from processes must be permitted and meet permit limits.
 - Drain disposal of chemical waste is prohibited.

What is a Hazardous Waste?

- ❖ **A waste is an unwanted or discarded material (solid, liquid, or gas) that meets meets certain characteristics:**
 - Ignitable – D001 (flashpoint $<140^{\circ}\text{F}$)
 - Organic solvents, oxidizers
 - Corrosive – D002 ($\text{pH} \leq 2$ or ≥ 12)
 - Acids, bases, corrode metal
 - Reactive – D003 (air or water reactive, normally unstable)
 - Sodium metal, cyanides & sulfates
 - Toxic - D004 – D043
 - Heavy metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag)
 - Poisons, pesticides, herbicides
 - Certain solvents – benzene, MEK

What is a Hazardous Waste?

❖ **Or, the unwanted or discarded material is a “Listed waste”**

- Chemicals on EPA’s lists (available on the EHSRM website)
- P-Listed – discarded, unused portions of chemicals, considered acutely hazardous
- U-Listed Wastes – discarded, unused portions of chemicals, considered hazardous
- F-Listed – process wastes generated from non-specific sources
 - Spent solvents, halogenated and non-halogenated

What is a Hazardous Waste

❖ Common Types of Hazardous Waste on Campus:

- Oil, oily water
- Batteries
- Fluorescent bulbs
- Mercury thermostats
- Shop waste (paint, acid, paint rinse water, old gasoline, solvent rags)
- Laboratory waste
- Old chemicals
- Pesticides, herbicides, old fertilizer
- Aerosol cans, compressed gas

Managing Your Hazardous Waste

- ❖ RCRA allows for waste to be stored in areas at or near the point of generation = Satellite Accumulation Areas (SAAs)
- ❖ Cannot exceed 55 gallons of waste.
 - Once 55 gallons is reached, waste must be moved to the 90-day storage unit (Container Accumulation Area)
- ❖ EHSRM picks up waste from the SAAs weekly.



SAA Management Responsibilities

- ❖ If you are responsible for any area (lab, shop, facility) where hazardous waste is generated, you must:
 - Notify EHSRM of new waste streams or changes to existing waste streams
 - Maintain SAA in compliance
 - Conduct weekly self audits
 - Maintain up-to-date chemical inventory
 - Additional duties for PI's and/or Lab Managers:
 - Date chemicals, dispose of peroxide forming chemicals before expiration date.
 - Lab Registration & Close Out

Signage – Emergency contacts, SAA sign



30-gallon HPDE bung top drum for liquid wastes

Satellite Accumulation Area

Solid Waste Containers
- NO liquids, needles, or
broken glass in solid
waste debris containers



Carboys – 5 gallons for
liquid wastes



Not provided by
EHSRM, but ok to use
if rinsed and
compatible



Secondary Containment for liquid wastes



Satellite Accumulation Area Requirements

- If you have a SAA in your work area, you must follow certain requirements:
 1. Containers must be properly labeled.
 2. Containers must be compatible with the contents being stored in them.
 3. Containers must be in good condition.
 4. Containers must be in secondary containment.
 5. A Satellite Accumulation Area sign must be posted.
 6. A Spill Kit must be provided.
 7. Emergency Contact information must be prominently displayed in the room.

NOTE: we will show you examples of each requirement following this slide

Satellite Accumulation Area Requirements

- Containers must be properly labeled
 - Labels must have the words “Hazardous Waste”
 - At STAR, you get the labels from the Business Manager.
 - Must list the contents on the label.
 - Must have the company name and room number.

HAZARDOUS WASTE		
Waste Hazard (check all that apply)	Chemical Constituents (no abbreviations)	Approx. Conc. %
<input type="checkbox"/> Flammable		
<input type="checkbox"/> Oxidizer		
<input type="checkbox"/> Corrosive		
<input type="checkbox"/> Reactive		
<input type="checkbox"/> Toxic		
PI Name:		
Bldg & Room #		

Satellite Accumulation Area Requirements

HAZARDOUS WASTE		
Waste Hazard (check all that apply)	Chemical Constituents (no abbreviations)	Approx Conc. %
<input checked="" type="checkbox"/> Flammable	Hexane	60
<input type="checkbox"/> Oxidizer	Benzene	40
<input type="checkbox"/> Corrosive		
<input type="checkbox"/> Reactive		
<input checked="" type="checkbox"/> Toxic		
PI Name: MEGA-TECH		
Bldg & Room # STAR, 110		

PI Label

HAZARDOUS WASTE		
Waste Hazard (check all that apply)	Chemical Constituents (no abbreviations)	Approx Conc. %
<input checked="" type="checkbox"/> Flammable	Lab Debris	98
<input type="checkbox"/> Oxidizer	Lead	0.5
<input type="checkbox"/> Corrosive	Silver	0.5
<input type="checkbox"/> Reactive	Acetone	1%
<input checked="" type="checkbox"/> Toxic		
PI Name: MEGA-TECH		
Bldg & Room # STAR, 110		
Acc. Date: 10/1/18		

Additional labeling (waste codes, accumulation date by EHSRM)

Satellite Accumulation Area Requirements

- ❖ Containers must be compatible with the waste stored in them.
 - No HF in glass containers
 - No corrosives in metal containers
 - Solvents do best in HDPE or lined metal containers.
- ❖ Wastes in common container must be compatible. Generally, do not mix:
 - Oxidizers with Organics (acids, solvents, org compounds)
 - Acids with Bases
 - Inorganics acids with organic acids
 - Reactive metals with acids, bases, alcohol, aldehydes, nitrated hydrocarbons, oxidizers



Waste Incompatibility Result



Satellite Accumulation Area Requirements

- Containers must be in good condition.
 - Bulging containers can be a hazard. The container may need to be vented in a fume hood if it is bulging
 - Enough head space should be provided for vapor build-up.
 - Keep the outside of containers as clean as possible.
 - Keep container lids on and closed at all times when not being actively used.



Satellite Accumulation Area Requirements

- RCRA Contingency Plan requires that:
 - A Spill Kit must be provided.
 - Emergency Contact information must be prominently displayed in the room.

TEXAS STATE	
EMERGENCY	
Police * Fire * Medical	
DIAL 911	
NON - EMERGENCY	
<ul style="list-style-type: none"> ✦ University Police 245-2805 http://www.police.txstate.edu/ ✦ Student Health Center 245-2161 http://www.healthcenter.txstate.edu/ ✦ Parking Services 245-2887 http://www.parking.txstate.edu/ ✦ LBJ Student Center Info 245-8686 http://www.lbjsc.txstate.edu/ ✦ Residence Life 245-2382 http://www.reslife.txstate.edu/ ✦ Texas Poison Control 1-800-222-1222 http://www.poisoncontrol.org/ 	
COMPLIMENTS OF: Environmental Health, Safety & Risk Management 245-3616 Mon - 5pm 738-6650 After Hour Emergencies http://www.fss.txstate.edu/ehsrm/	



Empty Containers

- A container that previously held a chemical that would be considered a hazardous waste when disposed, can be disposed of in the trash after:
 - It is triple rinsed, using minimal amounts of water
 - The label is defaced
 - Write “Empty” on Glass containers or crush metal containers, make them unusable

- **Important Exceptions:**
 - **IF** the empty container held an acutely hazardous waste (on EPA's P-List), EHSRM will pick up the original container as hazardous waste.
 - Any bottles with residue that won't come out will be picked up by EHSRM.



Compressed Gas Cylinders

- ❖ Usually returned to your vendor. Exceptions:
 - ❖ Small propane, butane bottles
 - ❖ Lecture size bottles
- ❖ If they are at atmospheric pressure and can be safely punctured, they can go to a recycling facility or trash.
- ❖ If you cannot use the remaining gas, it must be disposed of as a hazardous waste.
 - ❖ Can be costly.



Broken Glass

- ❖ Place broken glass in a rigid container or a lined sturdy cardboard box.
- ❖ Ensure other wastes are not disposed of in the broken glass container.
- ❖ When $\frac{3}{4}$ full, tie up the liner, close and tape the box, write "Broken Glass" on the outside of the box, place in dumpster.
- ❖ Biologically contaminated broken glass must be autoclaved prior to disposal in the trash.
- ❖ Grossly contaminated broken glass (acutely toxic visible residues) must go to hazardous waste.



What do I do with old chemicals

- Unwanted chemicals or those that are very old are considered a hazardous waste by regulating agencies.
- These chemicals should be disposed of as a hazardous waste.
- Contact EHSRM to obtain bins if needed.
- Provide an inventory of chemicals for disposal to EHSRM.
- Make sure chemicals have a product label.
- Some chemicals can become unstable and form peroxides. If you are unsure about moving a container, contact EHSRM.



Peroxide Forming Substances

List A: Chemicals known to form explosive levels of peroxides without concentration

Suggested safe storage period: If unopened from manufacturer, up to 18 months or stamped expiration date, whichever comes first. After opening, materials should be discarded or evaluated for peroxides within 3 months. Store under nitrogen if possible.

Divinyl acetylene	Potassium amide
Divinyl ether	Sodium amide (<u>sodamide</u>)
Isopropyl ether	Butadiene ^a
Vinylidene chloride	Chloroprene ^a
Potassium metal	Tetrafluoroethylene ^a

^a When stored as a liquid monomer

List B: Chemicals that may auto-polymerize as a result of peroxide accumulation

Suggested safe storage period: If unopened from manufacturer, up to 18 months or stamped expiration date, whichever comes first.

- After opening, materials without inhibitors should not be stored for longer than 24 hours.
- After opening, materials with inhibitors should be discarded or evaluated for peroxides within 12 months.

Acrylic acid ^a	Tetrafluoroethylene ^b
Acrylonitrile ^a	Vinyl acetate
Butadiene ^b	Vinylacetylene
Chloroprene ^b	Vinyl chloride
Chlorotrifluoroethylene	<u>Vinylpyridine</u>
Methyl methacrylate ^a	
Styrene	

^a Although these chemicals form peroxides, no explosions involving these monomers have been reported.

^b When stored in liquid form, these chemicals form explosive levels of peroxides without concentration. They may also be stored as a gas in gas cylinders. When stored as a gas, these chemicals may auto-polymerize as a result of peroxide accumulation.

List C: Chemicals known to present peroxide hazards upon concentration (distillation/ evaporation)

Suggested safe storage period: If unopened from manufacturer, up to 18 months or stamped expiration date, whichever comes first. After opening, materials should be discarded or evaluated for peroxides within 12 months.

Acetal (1,1-diethoxyethane)	2-Hexanol
Acetaldehyde	Methylacetylene
Benzyl alcohol	3-Methyl-1-butanol
2-Butanol	<u>Methylcyclopentane</u>
Cumene	Methyl isobutyl ketone
Cyclohexanol	4-Methyl-2-pentanol
2-Cyclohexen-1-ol	2-Pentanol
Cyclohexene	4-Penten-1-ol
Decahydronaphthalene	1-Phenylethanol
Diacetylene	2-Phenylethanol
Dicyclopentadiene	2-Propanol
Diethyl ether	Tetrahydrofuran
Diethylene glycol dimethyl ether (diglyme)	Tetrahydronaphthalene
Dioxanes	Vinyl ethers
	Other secondary alcohols
Ethylene glycol dimethyl ether (<u>glyme</u>)	
4-Heptanol	

High Hazard Deactivation is Costly



Waste Minimization

- ❖ Avoid unnecessary waste generation:
 - Substitute for less hazardous chemicals when possible.
 - Adjust processes to minimize waste generation.
 - Don't order more chemicals than you need.
 - Label Chemicals with Date Received and Date Opened
 - Don't keep chemicals past the expiration date or more than one year after they have been opened.



Spills and Emergencies

❖ Small spills:

- ❖ Hazard is known, volume is small enough to easily handle
- ❖ Notify your supervisor.
- ❖ Can be cleaned up in-house.
- ❖ Spill kits can be found in hallway.
- ❖ Waste clean up debris should be disposed of as a hazardous waste.
- ❖ Notify EHSRM after clean up is complete and request a waste pick up.

❖ Large Spills:

- ❖ Evacuate the area, notify supervisor, building management
- ❖ Call 911
- ❖ Call EHSRM



Requesting a Waste Pick Up

- ❖ Respond to the weekly e-mail for waste pickup sent by our office to lab P.I.s. To be added to the pickup e-mail, contact EHSRM.
- ❖ Fill out the Hazardous Waste Pick Up Request Form on the EHSRM website.
- ❖ You can also call our office at 245-3616.



Questions?

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