

13. Hazardous Waste Disposal

The following sections provide hazardous waste safety guidelines and procedures. This section covers the following topics:

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### 13.1 Hazardous Waste and Texas State University

Hazardous waste disposal is governed by the EPA and the Texas Commission on Environmental Quality (TCEQ) through State and Federal regulations. The purpose of environmentally sound disposal methods is to prevent harm to the water, land, and air.

Texas State University complies with hazardous waste disposal regulations by means of the Hazardous Waste Management Program Texas State University UPPS 04.05.06 Disposal of Hazardous Waste. The Environmental Health, Safety & Risk Management Office (EHSRM) administers this program.

- ◆ Permits and Requirements

Texas State University is a "Large Quantity Generator" of hazardous waste. The University's EPA and TCEQ Generator Registration I.D.s apply to all university activities. EHSRM will assist any department or System Part in determining its hazardous waste disposal needs.

- ◆ Penalties of Noncompliance

Noncompliance with any hazardous waste regulation may result in substantial fines and penalties for the University. The University may be cited or fined for numerous types of violations ranging from improperly labeling a waste container to intentionally disposing of hazardous waste incorrectly.

- ◆ Role of EHSRM

EHSRM administers the Hazardous Waste Management Program at Texas State University. Compliance with this program is very demanding — it requires full cooperation by all campus entities. The main focus of this program is chemical waste management (Hazardous, Class 1 and Class 2 Industrial). The program does not include procedures for the management of radioactive, infectious, biological, or municipal solid waste.

EHSRM collects, transports, and stores hazardous waste (less than 90 days) until it is shipped for final disposal. The Office also maintains permanent records (manifests) of all disposed waste. Contact EHSRM for more information on hazardous waste disposal.

### 13.2 Definitions

- ◆ Container Accumulation Area(s) (CAAs)

Designated by EHSRM to be used for the storage of hazardous wastes (less than 90 days) prior to shipment to an offsite permitted waste disposal disposal.

- ◆ Disposal

The proper disposition of Hazardous, Class 1 and Class 2 Industrial waste at a permitted treatment, storage or disposal (TSD) facility in compliance with all applicable TCEQ and EPA regulations.

- ◆ Generator  
Any person, by site, who produces hazardous waste or industrial solid waste; any person who possesses hazardous waste or industrial solid waste to be shipped to any other person; or any person whose act first causes solid waste to become subject to regulation. Generators accumulate waste in Satellite Accumulation Areas.
- ◆ Hazardous Waste  
Any solid waste material listed or identified in Title 40 Code of Federal Regulations, Part 261, Subpart D or exhibiting the characteristics of ignitability, corrosivity, reactivity, or TCLP toxicity also defined in 40CFR Part 261 Subpart C. Tables containing the listing and characteristics of hazardous wastes are shown in these subparts and in the University's Waste Analysis Plan, Attachment B.
- ◆ Mixed Waste  
A radioactive waste that is also a hazardous waste.
- ◆ Satellite Accumulation Area(s)  
A storage location at or near the point of generation where hazardous waste initially accumulates. The SAA are limited to storage of less than 55 gallons.
- ◆ Solid Waste  
Any garbage, refuse, sludge from a waste treatment plant, water treatment plant, or air pollution control facility or other discarded material. Solid waste can be solid, liquid, semi-solid, or contained gaseous material resulting from industrial, municipal, commercial, mining and agricultural operations, and from community and institutional activities.

### 13.3 Types of Hazardous Waste

An item is considered waste when the owner determines that the material is no longer useful and needs to be discarded. A detailed description of the wastes generated at the University is in the Waste Analysis Plan.

An item is considered to be hazardous waste if it meets one or more of the following characteristics:

- ◆ Mixture contains a listed hazardous waste and a non-hazardous waste.
- ◆ Material meets the definition of one of the following:
  - Ignitability (flashpoint < 60°C or supports combustion)
  - Reactivity (e.g., water reactives, cyanides, explosives, unstable chemicals)
  - Corrosivity (ph < 2 or > 12.5)
  - TCLP toxicity (e.g., pesticides, heavy metals, organic compounds, see Waste Analysis Plan, Attachment B.)
- ◆ Material is listed in 40CFR 261, Subpart D, (see Waste Analysis Plan, Attachment B.)
- ◆ Material is not excluded from regulations.

Individual departments are responsible for properly identifying the hazardous waste they generate and for following University disposal procedures. Departments should contact EHSRM for assistance if necessary to characterize hazardous waste through process knowledge or chemical analysis.

#### 13.4 Containers, Tags, and Collection

Proper containment, tagging, collection and disposal are essential to the success of the Hazardous Waste Program. The following sections discuss these areas.

##### A. Filling Containers

Hazardous waste collection containers must be in good condition, must not leak, and must be compatible with their hazardous contents. All containers must have suitable screw caps or other secure means of closure. EHSRM provides 5-gallon and 30-gallon HDPE High Density polyethylene carboys and drums that meet most of these compatibility requirements. The carboys and drums meet DOT Shipping requirements and are UN and NA rated.

If you are reusing a container to accumulate waste, destroy the original product label. EPA regulations require that waste containers be labeled with the identity of the contents, and the words "Hazardous Waste". EHSRM provides hazardous waste I.D. tags that meet these requirements. EHSRM will add the accumulation start date when the waste is picked up from the department and transported to the CAA(s).

***IMPORTANT!***

*Never overfill hazardous waste containers. Expansion and excess weight can lead to spills and extensive environmental exposure.*

- ◆ Allow about two inches of head space in 5 gallon containers.
- ◆ Fill closed head drums (larger than 5 gallons) to leave approximately four inches of head space.

Hazardous waste containers for solids are generally rated by their weight capacity and volume capacity. Take care not to exceed the weight capacity of a solid container. Weight is generally not a problem for jars and open head cans (5 gallons or less), but it can be a problem for open head drums (larger than 5 gallons). Depending on weight requirements, you may fill containers for solids within two inches of the closure.

***IMPORTANT!***

*Keep all waste collection containers closed except when adding or removing material.*

B. Completing Tags

When a container first receives waste it is necessary to attach a waste tag.

Follow these guidelines for completing hazardous waste tags:

- ◆ Use full chemical names or common names. Chemical formulas or abbreviations are not acceptable.
- ◆ List all chemical components in the waste container, including water. Long lists may be continued on a second tag.
- ◆ Indicate the approximate percent concentration of the chemicals, especially potentially explosive materials such as picric acid and nitro compounds.
- ◆ Add the building name and room number to the tag where indicated.
- ◆ Attach the tag to the container.

C. Collection and Disposal

EHSRM collects waste from generators on a weekly basis. Specific details concerning waste pickup procedures are in procedure RMS-01.03, "Hazardous and Non-hazardous Waste Pickup."

Containers with improper caps, leaks, outside contamination, or improper labeling will not be picked up until these problems have been corrected.

Improper disposal methods for hazardous chemical waste include the following:

- ◆ Disposal down the drain.
- ◆ Intentional evaporation in a fume hood.
- ◆ Disposal in the regular trash.
- ◆ Dilution and disposal down the drain.
- ◆ Leaving the waste in the generator's work area.

Once the waste is picked up by EHSRM it is transported to the Container Accumulation Area. The Hazardous Waste Specialist will add the proper waste code and pickup date to the label. The waste container's information will be added to the transporter log as inventory control.

D. Disposing of Empty Containers

EPA and TCEQ (40CFR 264.170, and TAC 335.41(f), TAC 335.508(2)) regulations stipulate that empty containers must meet the following requirements:

- ◆ Containers must not contain free liquid or solid residue.
- ◆ Containers must be triple rinsed (place the rinsate in an approved waste container).
- ◆ Product labels must be defaced or removed.
- ◆ Container lids or caps must be removed.
- ◆ Aerosol cans must be at atmospheric pressure or punctured.

**IMPORTANT!**

*Containers that do meet these requirements will be picked up for disposal by EHSRM.*

### 13.5 Minimization and Substitution

As a large quantity generator, Texas State University is required by Texas regulations to have a Pollution Prevention Plan to minimize waste toxicity and reduce the volume of waste generated. The following sections discuss how to minimize waste sources and waste products. Additional information can be found in the University's Pollution Prevention Plan.

#### A. Waste Source Reduction Techniques

Use the following techniques to reduce waste sources:

- ◆ Purchasing and Inventory Control
- ◆ Use computerized tracking systems to manage purchasing and control inventory.
- ◆ Maintain current inventory records to prevent overstocking and to monitor the shelf life of remaining chemicals.
- ◆ Develop a campus-wide chemical exchange network to promote chemical sharing and avoid redundant purchases.
- ◆ Negotiate with suppliers to gain volume discounts, flexible delivery schedules, and delivery of fewer small-sized containers without cost penalties.
- ◆ Purchase quantities for immediate use only. Do not order quantities to obtain a special unit cost savings.
- ◆ Obtain compressed gases from vendors who accept return of empty or partially full cylinders.
- ◆ Include waste generation as criteria in equipment selection.
- ◆ Rotate chemical stocks to use chemicals before their shelf-life expires.

#### B. Chemical Usage

- ◆ Use lab procedures that assure the integrity of chemical quality.
- ◆ Reduce spills and waste by pre-weighing chemicals for undergraduate use.
- ◆ Require proper labeling of all secondary containers. Replace all deteriorating labels on primary and secondary containers.
- ◆ Substitute less hazardous chemicals whenever possible (e.g., biodegradable scintillation cocktails instead of xylene or toluene-based cocktails).
- ◆ Minimize the use of heavy metals (e.g., silver, chromium, mercury, barium, cadmium, and lead).
- ◆ Substitute alcohol or electronic thermal monitors for mercury thermometers.
- ◆ Use "No-Chromix", detergents, or enzymatic cleaners to clean laboratory glassware.
- ◆ Minimize solvent waste by recycling or substitution.

C. Waste Minimization Techniques

Follow these techniques to reduce hazardous waste:

- ◆ Do not mix different types of waste.
- ◆ Do not put non-hazardous waste, such as a mixture of water, sodium bicarbonate, and acetic acid, into a waste container of hazardous waste.
- ◆ Do not combine inorganic heavy metal waste with organic solvents waste.
- ◆ Segregate halogenated waste solvents from non-halogenated waste solvents.
- ◆ Segregate waste streams by storing them in separate waste containers. Store waste containers separate from reagent containers being used to avoid accidental contamination.
- ◆ Decontaminate empty containers to make them non-hazardous.
- ◆ Neutralize dilute acids and bases to make them non-hazardous and suitable for drain disposal (i.e. as long as no heavy metals are in solution).
- ◆ When possible, redesign experimental protocols so that harmful byproducts are detoxified or reduced.
- ◆ Recycle chemicals via purification.
- ◆ Eliminate mercury compounds from laboratory experiments.
- ◆ Use small scale experimentation or testing processes (microscale) or double up students in laboratory exercises.

### 13.6 Segregation

Segregated waste is safer and easier to dispose of than nonsegregated waste. Mixed waste, for example, must be handled as both radioactive waste and hazardous waste.

Each employee who generates waste is personally responsible for the following:

- ◆ Ensuring that hazardous wastes are accumulated in safe, transportable containers.
- ◆ Ensuring that hazardous wastes are stored properly to prevent possible exposure.

In addition to the guidelines for waste minimization and substitution, follow these guidelines for waste segregation:

- ◆ Segregate waste into the following groups:
  - Halogenated solvents
  - Non-halogenated solvents
  - Acids
  - Bases
  - Heavy metals
  - Poisons
  - Reactives
- ◆ Segregate hazardous and non-hazardous waste streams, such as photo fixer (hazardous) and photo developer (non-hazardous).
- ◆ Do not combine inorganic heavy metal waste with organic solvent waste in hazardous waste containers.
- ◆ Double-bag dry materials contaminated with chemicals (paper, rags, towels, gloves, or kimwipes, etc.) in heavy-duty plastic bags. Do not mix them with liquid hazardous waste.

### 13.7 Special Concerns

Employees who generate hazardous waste must maintain and control their hazardous waste accumulation areas. Special concerns for hazardous waste include the following:

- ◆ Unneeded chemicals that are to be discarded must be handled and managed as hazardous waste.
- ◆ Unknown chemical waste will be picked up by EHSRM however the University will incur additional charges for the chemical analysis to determine the proper disposal method. If possible identify unknowns at the point of generation.
- ◆ Gas cylinders (including lecture bottles) are extremely difficult to discard. They should be returned to the manufacturer or distributor whenever possible. Cylinders that cannot be returned should be tagged as hazardous waste as soon as possible.
- ◆ Photographic chemicals containing silver may not be placed in the sanitary sewer. They must be disposed of as hazardous waste.
- ◆ Developer, paint waste, oil, paint rinse water, detergents, degreasers, and any other chemical cannot be disposed of in the sanitary sewer or storm sewer. These are prohibited for disposal by the City's Industrial Waste Water Permit issued to the University.



13.8 Contingency Plan and Emergency Response Procedures

Details concerning the University's spill response procedures can be found in the RCRA Contingency Plan and Emergency Response Procedures.

13.9 RCRA Hazardous Waste Training

- ◆ Generators in departments that handle hazardous waste receive specific hazardous waste training in accordance with 40 CFR265.16.
- ◆ Training is provided by EHSRM and training records are maintained by EHSRM.
- ◆ Training is provided initially upon hire and refresher training is provided by EHSRM annually.
- ◆ Training includes generator requirements (waste containers, labels, secondary containment, spill kits), CAA requirements, waste pickup procedures, and spill response procedures.
- ◆ The training is available on the EHSRM web site, offered in class settings, or electronically through TRACS.

END OF SECTION