

# **University of Louisville**

## **Physical Plant**

### **Waste Disposal Guide**

# Chapter 1 - INTRODUCTION

The University of Louisville is committed to maintaining a safe and healthful work environment for its faculty, staff and students. This manual contains procedures for reducing or eliminating accidental illness, injury, death or environmental damage which can result from the improper management and disposal of wastes produced by the University.

This Disposal Guide has been developed to assist University personnel in the proper handling and disposal of chemicals, or chemical products in the laboratory and other University work areas. Although the guide was specifically written to outline procedures for chemical wastes, it also contains valuable information on many other types of wastes (i.e., radioactive, infectious, asbestos, PCB's, gas cylinders, empty containers, controlled drugs, and waste oils).

Each person in a supervisory or management capacity is responsible for providing and maintaining proper waste management in his or her respective area and for ensuring that all authorized and applicable guidelines contained in this manual are followed. It is of prime importance that all supervisory personnel understand and accept this responsibility, and take an active role in working with faculty and staff to provide necessary training, and by setting an example for them to follow.

Ultimately, it is individual faculty and staff who are responsible for implementing this Disposal Guide, so take personal responsibility for your area. Your attitude, knowledge, and actions will determine the success of our environmental Programs.

## LEGAL OBLIGATIONS

Increased public concern over environmental issues led to a major expansion of the federal and state environmental laws in past years. Aggressive enforcement of these laws by regulatory agencies has also increased.

The numerous environmental laws enacted have been documented in thousands of pages of regulations, creating an extremely complex scheme. Despite this complexity, liability for noncompliance with environmental regulations is not limited to major, intentional offenses that cause significant harm to public health or the environment. In fact, sizable penalties have been imposed for relatively minor, inadvertent violations.

Regulatory agencies and the courts assume that persons working with chemicals today are knowledgeable of the potential hazards involved with their work. Therefore, civil and criminal penalties can be imposed on institutions for non-compliance. Further, this liability can extend beyond the institution to individuals, based on the reasoning that all responsible personnel, from a lab instructor to a college president, share in the duty of ensuring compliance with the environmental laws.

It is quite clear that the University of Louisville and its employees need to meet the challenges posed by the environmental laws and regulations. This Disposal Guide contains the information that will enable University personnel to meet their responsibility for environmental compliance.

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## Chapter 2 - JUST THE FACTS

This Chapter is designed to give users just the basics they need to know to manage Hazardous, Radioactive, and Infectious Wastes at the University of Louisville. It is for quick reference only and is by no means comprehensive. Users should read all the applicable portions of this Disposal Guide for full explanation of the waste disposal procedures at the University.

### How to Comply with the Hazardous Waste Regulations

Except for two areas controlled solely by the Department of Environmental Health and Safety (DEHS), all areas where hazardous waste are managed at the University of Louisville are considered satellite accumulation areas. This is a regulatory designation which allows generators in these areas to operate under the minimum of regulatory oversight. As such, the following five points are all that generators need to know to operate in compliance with the law. It is critical that generators know and understand these points and that they manage their waste in accordance with them.

#### *Hazardous Waste Satellite Accumulation Requirements*

- The container holding the hazardous waste must be marked with the words "*Hazardous Waste*". No variation of these words is permissible.
- The container holding the hazardous waste must be in good condition. This means no cracks, no rust, and no leaks.
- The container holding the hazardous waste must be compatible with the waste and any waste mixtures in that container must also be compatible.
- The container holding the hazardous waste *must be closed at ALL TIMES*. The only exception to this is when waste is being added to or removed from the container.
- Accumulation of hazardous waste in any satellite accumulation area cannot exceed 55 gallons at any time. If the area accumulates acutely hazardous waste, one quart is the maximum amount allowed to be accumulated. A list of the acutely hazardous wastes is available in Chapter 3 - *CHEMICAL WASTE MANAGEMENT SYSTEM*.

### How to get Hazardous and Chemical Waste Picked Up

#### Step 1

Complete and affix Container Labels to each of the containers of waste which you want picked up. Use only one label for each container and use chemical names only. No trade names, chemical formulas or chemical structures are allowed. Container labels are available through DEHS by calling 852-6670.

#### Step 2

Complete the [Chemical Pickup Request Form](#). You have the option of doing this via the Internet on the DEHS HomePage, or on a paper form. Pick-up forms are available through DEHS, and you can obtain them by calling 852-6670. Complete information is required or waste cannot be picked up. Use the label numbers that correspond to the container labels you have affixed to your containers. Please list the contact person who knows first hand about the waste being picked-up.

### **Step 3**

Submit the form electronically or mail it to DEHS. Your waste will usually be picked up within two weeks of DEHS' receipt of properly completed forms. DEHS must have access to the area where the waste is located to pick it up. If special arrangements for gaining access need to be made, please note this on the comments section of the request form.

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# Chapter 3 - CHEMICAL WASTE MANAGEMENT SYSTEM

## POLICY AND GOALS

The University of Louisville recognizes and accepts its responsibility to provide proper hazardous waste management for University operations such as its research, teaching and support functions that generate chemical waste. In meeting this responsibility, the University has charged the Department of Environmental Health and Safety (DEHS) with the primary responsibility for coordinating the hazardous waste management program. Hazardous waste management is not the exclusive responsibility of any one individual. Every person employed by the University must assume and demonstrate by their action primary responsibility for his or her own chemical waste.

Each employee is personally responsible for complying with the requirements contained in this Disposal Guide. Employees generating chemical waste have moral and legal obligations to see that the waste is handled and disposed of in ways that minimize both short-term and long-term harm to human health and the environment.

DEHS has defined five main goals for the University to fulfill this responsibility.

- Manage and dispose of hazardous waste in a manner which prevents harm to human health and the environment and protects the faculty, staff, and students
- Manage and dispose of hazardous wastes in the most responsible, environmentally sound, and cost-effective manner
- Reduce the quantity of hazardous waste generated by the University by encouraging prudent purchase of chemicals and training the University community in responsible work practices
- Provide safe storage of hazardous waste pending disposition
- Comply with all government regulations regarding hazardous waste management

## PROGRAM OVERVIEW

The primary goal in handling and disposal of hazardous waste is to do so in a manner which prevents harm to human health and the environment. Extensive federal, state, and local regulations govern hazardous waste management. The University is covered by these regulations, which are beyond the scope of this guide but, in general, they regulate the handling, transportation, storage, and disposal of waste. The regulations also require extensive record keeping and a "cradle to grave" tracking system which tracks hazardous wastes from their point of generation through disposal. This allows all waste to be accounted for at any stage between generation and disposal.

DEHS will collect hazardous wastes from each generating location at the University upon receipt of a properly completed [Chemical Pickup Request Form](#) from the generators of this waste. The wastes are transported by DEHS via a truck designed for transportation of hazardous materials to the University's Environmental Protection Services Center (EPSC). This facility has a hazardous waste permit and is engineered to meet building safety and fire codes. It is inspected annually by the Kentucky Department for Environmental Protection and the United States EPA to ensure compliance with applicable regulations.

The generating location, type, and quantity of each chemical is documented as wastes are shipped to the EPSC and this information is maintained by DEHS in a computer database. The wastes are then segregated according to compatibility groups and placed in the EPSC. Some wastes are treated to remove their hazardous waste designation and many liquid wastes such as solvents are consolidated with compatible

liquids in larger containers. The wastes are stored in the EPSC and scheduled for removal and disposal to a permitted hazardous waste facility within one year of pick up.

## WHERE IS HAZARDOUS WASTE GENERATED?

Most colleges and universities generate hazardous waste and therefore are regulated as hazardous waste generators. Chemical use in laboratories results in the need for disposal of mixed solvents, reagents, reaction products, and excess chemicals of all types. In addition, a number of other fairly common activities at colleges and universities may result in the generation of hazardous waste. Examples include an electrical shop that uses batteries that contain heavy metals and photography lab disposing of developing solutions that contain silver compounds. Listed below are some common points of generation at the University of Louisville.

SOURCE	WASTE GENERATED
Research and Teaching Labs	Waste solvents, reagents, experimentation residues, equipment mercury
Electrical Maintenance	Used light ballasts and batteries
Paint Shop	Waste solvents and old paint
Photographic Labs	Used developers and fixers
Buildings and Grounds Services	Pesticides, rodenticides, herbicides, fertilizers
Art Work	Used solvents, thinners, pigments, inks, acids, dyes and photographic solutions

## WHAT IS A HAZARDOUS WASTE?

In general hazardous waste is either:

- Listed in one of four lists that the EPA has generated, or;
- Exhibits a characteristic that the EPA has identified as making it a hazardous waste.

The initial step toward proper chemical and hazardous waste management is to determine whether the waste is hazardous. This determination is important to meet environmental regulations and to properly complete the [Chemical Pickup Request Form](#). A brief description of the process generating the waste is also required on the DEHS forms. This helps DEHS and the generator make the determination of whether the waste is a hazardous waste.

EPA has listed specific chemicals which are hazardous and must be handled in accordance with the hazardous waste regulations. They also identified certain chemical characteristics which can cause a waste to be designated as hazardous. This chapter discusses these lists and characteristics. For the purpose of this program, chemicals that should be considered waste are those which are contaminated or are spent and can no longer be used. Outdated chemicals, and chemicals in poor containers are also to be considered waste. Chemicals which have not exceeded their shelf life, are in good containers, and could be used by someone else are not classified as a waste. These chemicals should be collected by DEHS for placement in the redistribution program.

## *LISTED HAZARDOUS WASTES*

EPA has developed several lists of substances which have been shown to have toxic, carcinogenic, mutagenic, or teratogenic effects on humans or other life forms. Chemicals with physical characteristics such as ignitability, corrosivity, or reactivity are also listed. Because there are over 700 chemicals on these lists and the regulatory principles are not intuitive, determination whether or not a waste is hazardous using EPA lists is a complex task which requires some degree of familiarity with the regulations. Many chemicals which are at least moderately toxic, moderately corrosive or combustible do not appear on these lists. Therefore, any chemical suspected of having any toxic or hazardous properties should be handled by DEHS. Refer to the material safety data sheet, container label, or a reference book such as Merck Index to make determinations on toxicity. When in doubt about whether a material is hazardous, handle it as if it is or contact DEHS at 852-6670 for assistance.

## *CHARACTERISTIC HAZARDOUS WASTES*

Certain wastes which are not specifically listed are regulated as hazardous because they exhibit one or more of the following characteristics: ignitability, reactivity, corrosivity, or toxicity. If wastes exhibit any of these characteristics, they are regulated as hazardous, and arrangements for disposal must be made with DEHS. Material safety data sheets (MSDS), container labels, and reference manuals can be used to identify these characteristics.

### **A. IGNITABLE WASTES**

Any liquid waste having a **flashpoint of less than 140 degrees F.** is considered an ignitable hazardous waste. A flashpoint can generally be determined by reference to the container label, a material safety data sheet, a chemical reference manual, or testing. The following are examples of ignitable wastes: ethyl ether, methanol, ethanol, acetone, toluene, benzene, pentane, hexane, and xylene. Solids are also regulated as ignitable waste if the material is capable of ignition through friction, moisture absorption, or spontaneous chemical changes and burns so vigorously and persistently as to create a hazard. Many commercial products may also exhibit the characteristic of ignitability. Oxidizers are also considered ignitable hazardous wastes.

### **B. CORROSIVE WASTES**

Any waste with a **pH less than 2.0 or greater than 12.5** or which corrodes steel at a rate greater than 6 mm per year is regulated as a corrosive waste. Wastes in this category include many acids and bases. The following are examples of corrosive wastes: sulfuric acid, ammonium hydroxide, nitric acid, sodium hydroxide, and hydrofluoric acid.

### **C. REACTIVE WASTES**

Any waste that is shock-sensitive, violently unstable, reacts violently with air or water, or generates cyanide or sulfide gases is regulated as a reactive waste. Some common chemicals which are classified reactive are: picric acid and other polynitroaromatics, old ethers and other peroxide forming organics, organic peroxides, ammonium perchlorate and metal perchlorates, and metal amides and azides.

### **D. TCLP TOXIC WASTES**

Any waste which equals or exceeds a designated concentration of certain toxic compounds is regulated as a characteristically toxic hazardous waste. The test to determine these concentrations is known as the TCLP (Toxicity Characteristic Leaching Procedure). It determines the amount of the toxic compound that leaches from the waste, simulating what could leach into the environment from an improperly disposed waste. The extraction procedure is a standardized laboratory test that requires specialized equipment. Therefore wastes with any of the TCLP compounds are assumed to

be toxic. These compounds include the heavy metals such as lead, chromium, and barium as well as many organic materials and a group of pesticides. Some commercial products may exhibit the characteristic of toxicity through the TCLP testing procedure.

### *NON-REGULATED WASTES*

Many chemicals are not considered hazardous waste using the "Listed Waste" or "Characteristic Waste" criteria described above. However, these chemicals may be at least moderately toxic, moderately corrosive or combustible and should be collected by DEHS to ensure safe handling and disposal. No chemical or chemical mixture should be poured down the drain or thrown in the trash unless the user is sure that the material is inert or innocuous and has attained approval for the disposal from DEHS.

Materials with strong odor must not be disposed of via the sewer but should be maintained in sealed containers and collected by DEHS. Only solids that are inert or innocuous may be disposed of in the trash. Any containers placed in the trash must have all labels completely defaced. If the containers are damaged and are likely to break during trash collection, they should be boxed to protect custodians and labeled as trash. The determination on whether a material is inert or innocuous should be verified by consulting the material safety data sheet, container label or a reference manual. DEHS will dispose of other non-regulated materials via the sewer or trash after careful review. This will allow the University to ensure compliance with the stringent sewer regulations, as well as the landfill.

### *UNIDENTIFIED WASTES*

All wastes to be picked up by DEHS must be accurately described or they cannot be properly segregated. This greatly affects the safety hazards involved with handling and storage of these materials. From a regulatory standpoint, DEHS is prohibited from accepting unidentified wastes for transportation or storage. When an unidentified material or waste is discovered, an attempt to identify its contents should be immediately undertaken. Usually the contents can be identified by consulting individuals who work in the area where the unidentified material was found. If this fails, the material will have to be analyzed with the cost of analysis being borne by the department in which the material was found. Some common analysis performed to identify chemicals are: pH, flashpoint, reactivity screen (mix small amount of chemical with water to see if reaction occurs), specific gravity.

Thorough maintenance of labels on chemical containers reduces the occurrence of unidentified chemicals. Periodic review of chemical stock and careful recordkeeping reduces the chance of discovering containers with missing labels. The University's Summary and Compliance Manual for Hazard Communication Standard also has specific requirements and guidelines for labeling chemical containers that must be followed by all University personnel.

## **CHEMICAL WASTE HANDLING AND DISPOSAL**

### *How to Comply with the Hazardous Waste Regulations*

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- The container holding the hazardous waste must be compatible with the waste and any waste mixtures in that container must also be compatible.
- The container holding the hazardous waste *must be closed at ALL TIMES*. The only exception to this is when waste is being added to or removed from the container.
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### **Step 3**

Submit the form [electronically](#) or mail it to DEHS. Your waste will usually be picked up within two weeks of DEHS' receipt of properly completed forms. DEHS must have access to the area where the waste is located. If special arrangements for gaining access need to be made, please note this on the comments section of the request form.

## *DISPOSAL CONTAINERS*

- Containers holding hazardous waste must be in good condition, have proper fitting lids, and be compatible with the waste stored.
- A good practice is to use the same container in which the chemical was purchased as a pure product.
- The container must always be closed during storage.
- Hazardous waste must not be placed in an unwashed container that previously held an incompatible material.
- All containers must be thoroughly washed and allowed to dry before being used for waste storage.
- If a container holding hazardous waste is not in good condition, or if it begins to leak, the material must be transferred to a new container or placed inside a larger container that meets all the necessary criteria.

Five-gallon high-density polyethylene containers for accumulating waste solvents and other high volume liquid wastes are available from DEHS at no cost to University departments. These containers are distributed based on waste type and volume. Contact DEHS at 852-6670 to obtain these containers for high volume liquid wastes.

#### *Waste Solvents*

Waste solvents which are accumulated for collection by DEHS are to be segregated into halogenated and non-halogenated categories. Halogenated solvents contain a halogen compound such as chlorine or fluorine to reduce flammability. Non-halogenated solvents do not contain a halogen compound and are generally more flammable. The 5-gallon containers provided by DEHS for accumulation of solvents should be clearly marked "HALOGENATED" or "NON-HALOGENATED" and strictly limited to those types of solvents. These two categories of solvents are segregated for increased safety and efficiency.

#### *New Research, Abandoned Labs, and High Waste Volumes*

- If a new research project that will generate large quantities of waste is going to begin, contact DEHS ahead of time to plan waste management.
- If an investigator or other person is leaving their employment with the University, the department chair should contact DEHS prior to that person's departure. Laboratories should not be abandoned with chemical wastes present.
- If any activity that will generate large volumes of any type waste handled by DEHS (chemical, radioactive, infectious) will be commencing, contact DEHS prior to that activity's start up so that proper planning for waste disposal can be accomplished.

## **WASTE MINIMIZATION**

Effective hazardous waste management requires not only safe, sound practices, but also requires extensive efforts to reduce the volume and toxicity of hazardous wastes. The University's waste minimization efforts must also be reported annually to the Kentucky Division of Waste Management. Waste minimization efforts reduce disposal and the hazards and environmental impact associated with chemical wastes. The success in minimizing hazardous wastes depends on a conscientious effort by each individual at the University. These are some common waste minimization strategies:

#### *REDUCING CHEMICAL PURCHASES*

A substantial portion of hazardous waste produced at the University consists of unused, outdated chemicals. Careful planning of quantities of chemicals required can reduce costs to the laboratory and reduce waste volumes. Many chemicals may also degrade over time, so careful consideration of quantities purchased. Also, risk of accident and exposure to the chemical and space needs are less when handling the smaller container. Although it may seem less expensive to buy chemicals in larger quantities, it is in fact more expensive if the cost for disposal is taken into consideration. Some chemical manufacturers sell chemicals in smaller containers to help laboratories reduce the excess purchase of chemicals. When disposal cost are considered, it is more economical to purchase only the quantities of chemicals that will be used.

## *SUBSTITUTION*

A non-hazardous chemical can often be used in place of a hazardous chemical. For example, some academic laboratory procedures still specify benzene or carbon tetrachloride as reagents or solvents. These compounds often can be replaced by less hazardous materials. This results not only in safer procedures, but also in wastes that may be hazardous in some respects. Additionally, many commercial, non-hazardous glass cleaners are available in lieu of toxic and corrosive chromic acid. Similarly, different procedures may be available which do not require the use of hazardous chemicals.

## *LABEL CONTAINERS*

Keeping all of the containers in your lab labeled with their contents will result in safer work practices as well as removing the need to dispose of unidentified chemicals.

## **CHEMICAL EXCHANGE/REDISTRIBUTION**

Chemical purchases can often be reduced by borrowing and sharing chemicals between laboratories. Departments are encouraged to exchange chemicals whenever possible and utilize the DEHS Chemical Redistribution Program as much as possible.

Not all the chemicals picked up by DEHS are a waste. Many are only partially used and have not exceeded their shelf life or been altered in anyway. Others are unused and still in the original sealed container. In some cases, these chemicals can be used by someone else at the University. Reusable chemicals collected by DEHS are brought to the central accumulation area, recorded, segregated, and held for redistribution instead of disposal.

The redistribution program can mean a real cost savings for the University in two ways. First, utilizing chemicals from the redistribution program decreases the amount of new chemicals purchased. Secondly, chemicals which are redistributed do not require disposal, avoiding the extremely high cost associated with that service. Each chemical may be reviewed prior to acceptance. The person who receives the chemical is responsible to determine the suitability of the chemical for their use.

## *LESS IS BETTER PUBLICATION*

DEHS has a publication prepared by the American Chemical Society entitled "Less is Better" which contains more detailed information on the chemical waste minimization strategies outlined in this section. Copies of that publication are available (at no cost to department) upon request at 852-6670.

# Chapter 4- RADIOACTIVE WASTES

## Radioactive Waste Disposal Procedures:

### A. Responsibility

All use of radioactive material must be authorized by the University Radiation Safety Committee and monitored by the University Radiation Safety Office (URSO). Proper disposal of radioactive waste is mandatory. Record the date and disposal activity of all radionuclides on the "Radioactive Material Usage Record" form, (see Appendix D of Radioactive material User Guide). Copies of this record must be sent to URSO monthly if material is used. The following information outlines general disposal instructions. For further clarification or specific instructions, contact URSO (852-5231).

### B. Disposal

#### Solid Waste

Dry solid waste (gloves, plastic, glassware, and paper) can be classified as "long half-life" (greater than 120 days), "short half-life" (less than or equal to 120 days) or de minimis. De minimis waste, as stated in 902 KAR 100:021-2, is:

(A) 0.05 microcurie or less of H-3, C-14, or I-125 per gram used for liquid scintillation counting or in vitro clinical or in vivo laboratory testing; and

(B) 0.05 microcurie or less of H-3, C-14, or I-125 per gram of animal tissue averaged over the weight of the entire animal.

Due to the high cost of waste disposal, it is imperative users of radioactive material establish and practice procedures to minimize radioactive solid waste. The following page contains some suggested practices to use to minimize waste production, if possible.

Some suggested waste reductions methods:

- Recycle or reclaim
- Source reduction--substitute short-lived material
- Modify process to reduce waste
- Keep down contamination
- Clean contaminated items and dispose of as clean
- Concentrate by ion exchange or charcoal absorption
- Compact commercial waste
- E-Mail [Assistant Radiation Safety Officer](#) or call at 852-5231 for more information concerning waste reduction methods.

Disposal summary for solid and de minimis waste

- Solid waste will consist of gloves pipette tips, bench paper, etc.
- Solid waste containers will be clearly marked with the yellow "RADIOACTIVE WASTE" stickers and radiation symbol on each side of the container.
- Waste will be in a shielded container if necessary.
- All waste must have any radiation symbols defaced before it is put into the proper waste container
- All waste must be in clear plastic bags, and different nuclides must be stored separately.

- Each bag must have a Radioactive Waste Card attached with the Authorized user name, date, nuclide, chemical form, and amount of nuclide.
- De minimus waste is defined as H-3, C-14, or I-125 that is calculated to contain less than 0.05 uCi/gm
- For waste pickup, follow the procedure listed at the end of this chapter.

### Liquid Waste

Liquid waste consists of stock solution and liquid scintillation vials. Relatively small volumes (a few ml's) of aqueous liquid may be transferred onto absorbent material and disposed of per the solid waste procedures. Record the date and activity of all disposals of liquid in the appropriate column on the Radioactive Material Usage Record form. When material is disposed, copies of this form must be sent to URSO monthly.

In some instances it may be necessary to dispose of radioactive material or wash contaminated items in a designated disposal sink. The disposal must be accurately recorded on your usage record. The water must be run for a half hour and the sink surveyed and wipe tested for residual contamination.

#### Disposal summary for liquid waste

- Stock solution must be stored in separate containers per nuclide and the container must be compatible with the waste stored.
- Liquid scintillation vials must be stored separately according to nuclide, and packaged in easily movable containers (i.e. the plastic, blue tubs).
- Each bottle or container of liquid scintillation vials must have a Radioactive Waste Card attached with the authorized user name, date, nuclide, chemical form, and amount of nuclide.
- All liquid must also be labeled as biodegradable or organic material.
- Any liquid containing the organic material must be stored in plastic tubs labeled that are labeled as hazardous material.
- Each bottle of stock solution or container of liquid scintillation vials must have a Radioactive Waste Card attached with the authorized user name, date, nuclide, chemical form, and amount of nuclide.
- For waste pickup, follow the procedure listed at the end of this chapter.

### Animal Carcasses

When using radioactivity in animals or animal tissues, the Authorized User must provide an auxiliary protocol. This protocol must detail the kind and quantity of radioactivity to be used, methods of disposal, and contamination control. An "Animal Use Proposal Clearance Form" (see Appendix U) will be provided by Research Resources, or can be obtained from Radiation Safety. Before this protocol is presented to Research Resources it must be approved by the University Radiation Safety Office. All animals which have been given radioactive material should be isolated from animals that do not contain radioactive material. The cages which house the animals containing radioactive materials must be labeled with an appropriate radioactive materials warning sign. The cages must be locked, or otherwise secured unless attended. Surveys and contamination checks must be performed of the area which includes the bedding and animal housing. All contaminated items must be handled per the Radioactive Material Users Guide.

## Disposal summary for animal carcasses

- Animals receiving de minimus levels of radioactive material must be prepared for disposal as infectious waste and then brought to Radiation Safety for disposal.
- If the material in animals has a half life greater than 90 days, the animals must be prepared for disposal as infectious waste, then brought to Radiation Safety to be disposed.
- If the material in the animals has a half life less than or equal to 90 days, the animal must be stored in the lab in an appropriate area for 10 half lives, labelled as infectious waste, then brought to Radiation Safety to be disposed.
- A yellow Radioactive Waste Card must accompany all bags that will be taken by Radiation Safety.

## PICK-UP REQUEST

- When containers become full and need to be picked up by Radiation Safety, complete the Radioactive Waste Pick-up Request Form either [On-Line](#) or on paper send the white copy to Radiation Safety.
- Upon receipt of the pick-up request form, Radiation Safety will contact the lab to set up a time for pick-up.
- A Radioactive Waste Card must be attached to each bag or container before Radiation Safety will pick-up the waste.

Waste will not be picked up by URSO personnel if any of the following situations occur:

- a. The waste is not properly identified on the waste receipt form.
  - b. Area was locked or no one was present to identify the waste to be taken.
  - c. The liquids contains organic material and an approved container is not available to use for transport.
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# Chapter 5 - MISCELLANEOUS WASTE

## Infectious Waste Management Program

Regulations imposed by local, state, and federal agencies dictate that infectious waste must be segregated, packaged, and disposed of in a specific manner. The primary purpose of the regulations is to limit on-the-job exposure to blood and other potentially infectious materials. The following guidelines were implemented by the University during November 1988 and revised in July, 1997.

All wastes listed in this section must be segregated from other wastes, packaged, and disposed of in accordance DEHS procedures. DEHS requires infectious waste to be classified as one of three types of waste:

### 31. Medical Waste

- Microbiological waste - i.e., stocks and/or cultures of etiological or infectious agents, including culture plates, test tubes, swabs, etc. contaminated with these agents
- Human blood and blood products - i.e., all liquid blood, serum and plasma
- Potentially Infectious Medical/laboratory glassware including slides, pipettes, blood tubes and vials, and contaminated broken glass
- Transgenic Plant Material - plant's genetic material that has been altered by the introduction of genes from another organism.

### 32. Sharps

- Syringes
- Needles
- Scalpel blades
- Glass and plastic pipettes and vials
- All needles, scalpels, syringes or other sharps, regardless of their use are to be managed as Sharps.

### 33. Pathological Waste

- Human organs, body parts and surgical specimens or body parts removed during surgery or invasive procedures i.e. obstetrical, autopsy and laboratory procedures.
- Contaminated animal parts/tissues, and carcasses.
- Chemotherapy waste

## Infectious Waste Segregation

At the point of generation, infectious waste is to be segregated by type and placed into separate containers for shipment. Laboratories and other infectious waste generators areas will separate each infectious waste stream into 32-gallon red containers lined with an approved biohazard bag. It will be the responsibility of all University employees or students that generate infectious waste to segregate the waste accordingly. Infectious waste that has not been segregated appropriately will remain in the laboratory or treatment area and an "Incomplete Work Notice" will be issued through Custodial Services. For more information please contact 852-6670.

## Medical Waste and Sharps Segregation

Medical waste consisting of microbiological waste, human blood and blood products, potentially infectious medical/laboratory glassware, transgenic plant material and sharps will be managed in the following manner:

Medical waste will be placed in 32-gallon red infectious waste containers lined with an approved biohazard bag. All sharps must be placed in an approved sharps container. When the sharps container is full, it must be placed into a 32-gallon red infectious waste container lined with an approved biohazard bag. When the 32-gallon red container is full, laboratory or clinical staff will tie the bag shut. Custodial staff will pick up the waste whenever they find the bag has been tied shut. There is no need to notify Custodial Services to have infectious waste picked-up as custodians routinely collect infectious waste each evening. Infectious waste must be properly secured for collection by the custodians. "Properly secured" is defined as all biohazard (red or orange) bags tied, fastened or secured in the most efficient manner prior to custodians removing the container from a work area. If the bags are not closed, custodians are required to leave the bag/container where it was left and issue an "Incomplete Work Notice".

### **Pathological Waste**

Pathological waste consisting of human organs, body parts, surgical specimens, contaminated animal parts/tissues and carcasses, and chemotherapy waste will be managed in the following manner:

Pathological waste will be placed in 40 pound, square, fiberboard, DOT approved shipping containers lined with an approved biohazard bag. Custodial staff will pick up the waste whenever they find the bag has been tied shut, and the boxes taped closed. The generating location must be on the box. There is no need to notify Custodial Services to have infectious waste picked-up as custodians routinely collect infectious waste each evening. Infectious waste must be properly secured for collection. If the boxes are not closed, custodians are required to leave the boxes and issue an "Incomplete Work Notice". All biohazard bags are to be kept in containers designated for infectious waste only. These containers are supplied by the University's infectious waste contractor and are made available through Custodial Services (Ex. 7174). Any biohazard bag found in a regular trash container will be left in the work area where it was discovered.

**Note:** Waste minimization should be encouraged to reduce the amount of infectious waste that must be treated and disposed. Normal refuse that is not contaminated should be placed in the trash can.

### **Broken Glassware**

Other wastes not covered in this guideline may require special handling or disposal as follows:

Pipettes, broken glassware, microscope slides, and cover slips not considered infectious under this guide should be regarded as injurious materials because they present a physical hazard to custodians if placed in the regular trash. Additionally, plastic vials, pipettes etc are also defined as injurious and should be handled as such in the same manner indicated. These items should be boxed, sealed, and labeled "Broken glassware disposal". Please insure the box selected for shipping broken glass is suitable, sturdy and is taped completely closed for shipping. Boxes needed to insure proper shipping of broken glass and plastic can be ordered through Fisher Scientific (1-800-766-7000) or Lab Safety Supply (1-800-356-0783).

Glass that is not broken may be placed in regular trash receptacles provided that it is not done so in a manner that can reasonably be expected to lead to its breakage. For more details on unbroken glass, see the [Empty Container](#) section found later in this Disposal Guide.

It is the responsibility of every department, unit, or laboratory generating infectious waste to provide the appropriate packaging materials (i.e., sharps container and orange or red infectious waste bags). Biohazard waste bags must be orange or red and can be obtained from either Superior Paper (583-1647), Fisher Scientific (1-800-766-7000) or other laboratory supply companies.

## **ASBESTOS MATERIALS**

If the presence of asbestos-containing materials is suspected, especially those in poor condition, contact DEHS at 852-6670. Asbestos containing waste should be disposed of through the Chemical Pickup procedure detailed in Chapter 3.

## **PCB MATERIALS**

PCBs (Polychlorinated Biphenyls) are compounds that were widely used in the past in oils and dielectric fluids due to their excellent heat exchange and insulating properties. However, because of their persistence in the environment and ecological damage from water pollution, their manufacture was discontinued in 1976. The handling, storage, transportation, and disposal of PCBs are now strictly regulated by the EPA. Some examples of items which may contain PCBs are:

- Electrical transformers
- Electrical capacitors
- Fluorescent light ballasts
- Hydraulic fluids
- Optical liquids

Anyone generating these materials at the University must handle them as a chemical waste as outlined in Chapter 3. Items such as gloves, clothing, or utensils/tools that become contaminated with PCBs shall also be handled as a chemical waste in accordance with Chapter 3.

Physical Plant employees who repair or replace lighting fixtures throughout the University must follow the following procedures while handling the ballasts associated with these fixtures. Manufacturers are now required to label ballasts "Non- PCB". Prior to handling any ballast, check to see if it is labeled "Non-PCB". If the article is not labeled "Non-PCB", assume it contains PCBs and precautions should be taken when handling these items. If the article is intact and not leaking, wear a pair of rubber or plastic gloves. Inexpensive surgical gloves will suffice if not worn for extended periods of time. If the article is leaking, also wear a pair of goggles. Contact DEHS to coordinate any clean-up from the floor or other areas.

**Do not put leaking ballast in containers already holding non-leaking ballast. Leaking ballast must be segregated in a small container and managed as a chemical waste as outlined in Chapter 3.**

55-gallon drums for lighting ballast can be obtained from DEHS. Physical Plant must notify DEHS of the location of ballast drums to ensure that they are labeled appropriately. Only lighting ballast should be placed in these drums, they should not be used for general trash or other special wastes. Once the drums are full, follow the procedures in Chapter 4 to have DEHS pick them up.

## GAS CYLINDERS

Gas cylinders are widely used at the University in teaching and research laboratories and in maintenance and construction operations. University personnel using cylinders must make every attempt to return them to the supplier when finished. Suppliers will usually accept empty or partially full cylinders at no cost. The best approach is to check with the supplier before purchasing any cylinders to see if used cylinders will be picked up when new ones are delivered. If the supplier will not, try to locate one that will. It is extremely difficult and expensive to have cylinders disposed.

If cylinders cannot be returned to a supplier, they can be handled through the DEHS chemical waste program. Follow the procedures in Chapter 3 to have them picked up by DEHS.

## EMPTY CONTAINERS

The improper handling or management of empty containers not only creates an undesirable aesthetic situation at the University but, due to their contents, may also pose an environmental and human health hazard. The University is governed by state and federal environmental agencies which regulate the management of these containers and their contents. Improper handling can result in fines or other penalties imposed against the University.

Empty containers, ranging from small glass bottles to 55-gallon drums, are defined as those having all contents removed by commonly employed practices (e.g., pouring, pumping, scraping, etc.), with no solids or free-flowing liquids remaining in the container.

All chemical containers handled under these procedures must be **empty**. That means that **no material can be poured or practicably removed from that container**. If any material can be poured from the container then it must be either used or managed under the Chemical Waste Management Program outlined in Chapter 3. If a container held an acutely hazardous waste it must be managed as a hazardous waste through the procedures detailed in Chapter 3. Contact DEHS for a list of the acutely hazardous wastes.

### To handle empty containers

- Remove completely or deface all labels on the container and remove the lid.
- Thoroughly rinse all containers and place upside down on paper towels until completely dry.
- Place containers in regular trash for collection by custodians.
- Any broken glass containers must be placed in a rigid box that is marked as "broken glass". These boxes may be placed *with* (not in) the regular trash for collection by custodians. See [Infectious Waste Disposal Information](#) for further information on broken glass disposal.
- Glass that is not broken may be placed in regular trash receptacles provided that it is done in a manner that will not lead to its breakage. For example, it is reasonable to assume that one container placed in a trash can will not become broken. Glass containers should not be *thrown* into trash cans and several glass containers should not be placed in the same trash can. If you are in doubt, place the glass containers in a rigid box as outlined in the broken glass section above.

## **PHARMACEUTICAL/CONTROLLED DRUGS**

Various controlled substances are used at the University for instructional activities or conducting research. Any person engaged in activities with controlled substances must be registered with the Drug Enforcement Administration (DEA).

To dispose of controlled substances, contact the DEA for authority and instructions. The DEA will require certificates of destruction in many cases. The DEA will then authorize and instruct you to dispose of the controlled substances in one of the following manners:

- By delivery to the local DEA
- By destruction in the presence of an agent of the DEA
- By such other means as the DEA may determine to assure that the substance does not become available to unauthorized persons.

The person in possession of the substance is responsible for its disposal in accordance with the DEA regulations. DEHS will only pick up controlled substances on a case-by-case basis.

## **WASTE OILS**

Waste oils from maintenance shops, pumps, equipment, machinery, etc. should be collected by DEHS using the Chemical Waste Management Procedures outlined in Chapter 3. Do not mix any other material with waste oils and do not allow water to enter waste oil containers. Waste oils can usually be transferred to a recycler at little or not cost to the university. However, waste oil which has been mixed with water, solvents, heavy metals, toxics, PCB's, or other chemical substances may result in substantial costs to the university. Containers used for accumulating waste oils must be clearly marked "USED OIL" will help prevent this problem.