Science at the heart of medicine

# Waste Disposal Training

Department of Environmental Health & Safety

***"Working Safely Together"***

https://einsteinmed.edu/administration/environmental-health-safety/

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# Introduction

- Solid and hazardous waste management and disposal is complicated and expensive.
- The process is regulated by various local, state, and federal government agencies.
- Proper waste management includes identification, segregation and/or separation at the source, minimization, and recycling initiatives.
- Mismanagement and non-compliance with applicable regulations have resulted in monetary penalties against many colleges and Universities.
- Waste must be managed and disposed of properly.  Inadequate waste management poses health and safety risks to students, faculty, staff, and the environment.

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# Identifying waste

- Proper laboratory waste disposal begins at the experimental design stage.
- Evaluate what you need to conduct the experiment and consider the types of waste that will be generated in the  procedure.
- Consider alternative chemicals; consider less hazardous chemicals that may be safer and generate a less costly hazardous waste stream.



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# Minimizing Hazardous Waste Generation

- Order only the amount of material needed for the experiment.
- Excessive stocks of hazardous chemicals, radioactive materials, and infectious agents presents serious storage, safety, and disposal problems.
- Consider using non-hazardous material alternatives to conduct your research.
- Regulatory agencies may enforce minimization programs as waste becomes more difficult to dispose.

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# Waste Types at Albert Einstein College of Medicine (Einstein)

- Waste generated at Einstein includes solid, biohazardous, radioactive and chemical/hazardous waste.
- Different waste types must be discarded in separate waste containers.
- Disposal of these waste types are regulated by federal, state, and/or local regulations which are enforced by the USEPA, NYSDEC, FDNY, OSHA and NYCDEP to name a few.

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# Waste Generated at Einstein includes…

- Municipal/Office trash
- Recyclable waste
- Laboratory waste
- Infectious waste
- Sharps
- Broken glass/bottles
- Animal bedding
- Animal carcasses
- Chemical waste
- Mixed waste
- Photographic and chemical fixer
- Radioactive waste
- Universal waste
- Computer monitors and other electronics
- Refrigerators and other equipment
- Paint & paint-related materials

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# Waste Containers

- Waste must be segregated and placed in the appropriate containers.
- Once the waste containers are full:
  - Municipal/Office (ordinary) trash and recyclables: Picked up by Housekeeping
  - Medical waste: Closed by the lab and picked up by housekeeping
  - Chemical/Hazardous Waste: Labeled by the lab and picked up by Environmental Health and Safety (EH&S) and transferred to a vendor for disposal according to applicable federal, state or local regulations.

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# Waste Disposal - Ordinary Waste/Trash

- This is waste that is generated during the normal course of daily living or business activities.
- It includes paper products, products wrapping, newspapers, food, and beverage containers.
- Reducing, reusing, and recycling is highly encouraged to reduce average office waste volume.
- Housekeeping removes the waste from waste baskets and discards it in the appropriate container.

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# Municipal/Office trash
# Recyclable waste


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# Non-infectious Laboratory Waste

- Generated when conducting research with non-pathogenic organisms.
- May include gloves, pipettes, culture dishes, flasks, plates, dispensing tips, Eppendorf tubes, conical tubes, and any item that appear has been used in medical research.
- When the red bin is nearly full a laboratory worker must tie the red bag and seal the lid.
- Housekeeping will remove the medical waste bin and provide a replacement.
- Medical waste bins will be moved to the designated loading dock for removal by medical waste vendor.


Red Medical Waste Bin

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# Infectious Materials

- This is pathogenic waste generated in laboratories (BSL-2 or BSL-3).
- Include culture dishes, vessels, transfer pipettes, discarded live and attenuated cultures, human blood and blood products, tissue specimens, gloves or other protective equipment.
- Infectious waste must be either autoclaved or chemically disinfected prior to disposal in the medical waste bin:
  - Autoclave the waste in an **"autoclave bag"** or chemically treat the waste. Once neutralized it may be discarded into the medical waste bin.
  - If waste is liquid, treat with disinfectant and allow sufficient contact time and discharge to sanitary sewer by way of the laboratory sink.

**Do Not Autoclave Bleach or Other Disinfectants**

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# Autoclave Infectious Waste

- Follow appropriate procedures for operation
- Before using an autoclave, always don personal protective equipment (PPE) such as lab coat, heat-resistant gloves and safety glasses.
- Use only autoclave bags or compatible containers/plastics in an autoclave
- Loosely tape the opening of bags for steam penetration.
- Always use secondary containment
- Remove waste from autoclave upon completion of cycle.
- Do not autoclave chemicals or radioactive material.

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# Chemical Disinfectant

- For infectious materials, you need to use the appropriate chemical disinfectant at the right concentration and allow sufficient contact time for proper decontamination before disposal.
- Bleach is an example of a potential disinfectant that can be used to disinfect contaminated items.
- Use a 10% dilution of household bleach or other EPA registered tuberculocidal.
- Allow sufficient contact time (10-15 minutes) to ensure decontamination.

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# Infectious Materials (cont.)

All items removed from the BSL-3 containment facility must be autoclaved prior to removal/disposal.

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# Sharps Disposal (nonradioactive)

- Sharps are a special type of laboratory waste that must be discarded in a separate container (Sharps Container).
- Sharps include syringes with or without needle, needles, glass pipettes, suture needles, slides and coverslips, scalpel, tweezers, razor blades and broken vials.
- If sharps are infectious, place the sharps container in the autoclave before disposing into the medical waste bin.
  - If sharps fall in the sink, use tongs or other mechanical means to remove from the sink. This will prevent drains from being clogged.
- At no time shall sharps be placed inside the any waste container without first being placed in the sharps container.


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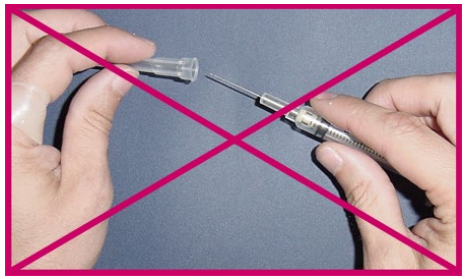
# Sharps Disposal (cont.)

- Labs are responsible for purchasing their own sharps containers through Fisher Scientific or other vendors. Sharps containers must be:
  - ✓ Rigid
  - ✓ Non-breakable and puncture resistant
  - ✓ Impervious to moisture and leak-proof
  - ✓ Red in color with the universal biohazard label.



- DO NOT recap, clip, bend, shear, or separate needles from syringes.
- When the sharps container is ¾ full, it is the responsibility of the laboratory worker to close and lock the lid and place the whole container into the medical waste bin.
- When the medical waste bin is almost full it is the responsibility of laboratory workers to seal/tie the bag and close the lid.
- Housekeeping will remove the medical waste bin and provide the laboratory with a new medical waste bin.

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# Sharps Disposal (cont.)


- Needles
- Syringes with or without needle
- Suture needles
- Glass pipettes
- Slides and coverslips
- Scalpel
- Tweezers
- Razor blades
- Broken vials

If infectious, disinfect by autoclaving before disposal into medical waste bin.
Never dispose of any type of sharps through the sink drain.

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# Plastic Serological Pipettes



- Serological pipettes may present a sharps hazard if the are comingled with heavier wastes.
- Plastic pipettes may contain residual liquid. To minimize contamination:
  - Place them in a cardboard box which has been lined with a plastic bag.
  - If infectious, chemically disinfect or autoclave before disposal.
  - When the box is full seal and discard it into a medical waste container.

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# Medical Waste Disposal

- Department of Transportation require all bin closed in order to prevent leaks or spills.
- Once the medical waste bin is ~2/3 full, close the bag by gathering the top and twisting to close it with a single overhand knot.
- Do not tie the bag closed by crossing the ends.

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# Broken Glass/Bottles


- To minimize cut and injuries, place broken glass pieces in a cardboard box, label, seal with tape and dispose in ordinary trash.
  - Glass must be clean in order to go into the regular trash.
- If contaminated place in a sharps container before disposing in the medical waste bin.

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# Animal Bedding (nonradioactive)

- Soiled bedding from animals should be disposed via down draft tables in the animal institute.
- If the waste must be disposed in the lab due to spillage, close-up the black or red bag containing the bedding to reduce allergens.
- Soiled bedding that is contaminated with infectious materials, chemicals, or radiation should be disposed via proper waste streams.
  - Infectious waste should be autoclaved or chemically disinfected and discarded in medical waste bin.
  - Chemical bedding should follow SOP in the animal protocol.
  - Radioactive materials must be treated as radioactive waste.
- Non-infectious bedding can be disposed as general waste (black bag).

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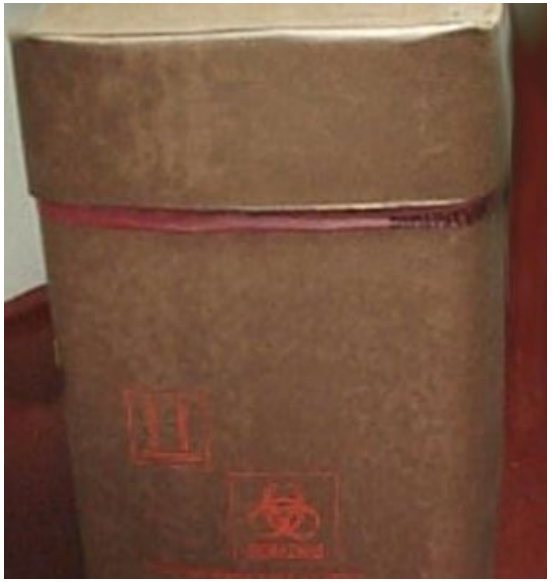
# Pathological Waste
## Animal Carcass Disposal

- Carcasses and body parts of animals that have not been preserved must be double-bagged to prevent leakage and disposed in the pathological waste bins in the Animal Institute.
- Carcasses and body parts of animals that have been preserved must be separated from the preservative. Preservative must be collected as chemical waste and animal parts double-bagged and disposed in the pathological waste bins.
- Animal carcasses can be stored in the laboratory freezer for a short period of time prior to disposal in the pathological waste bin.
- If anesthesia is used, you should allow animal to off-gas in the fume hood before disposal.
- Animals used with radioactive material may need to be treated as radioactive.



**Refrigerator/Freezer locations**:

- Ullmann 1008
- Chanin 617
- Kennedy B25
- Price B151

- **Do not store excessive carcasses in your laboratory freezer**

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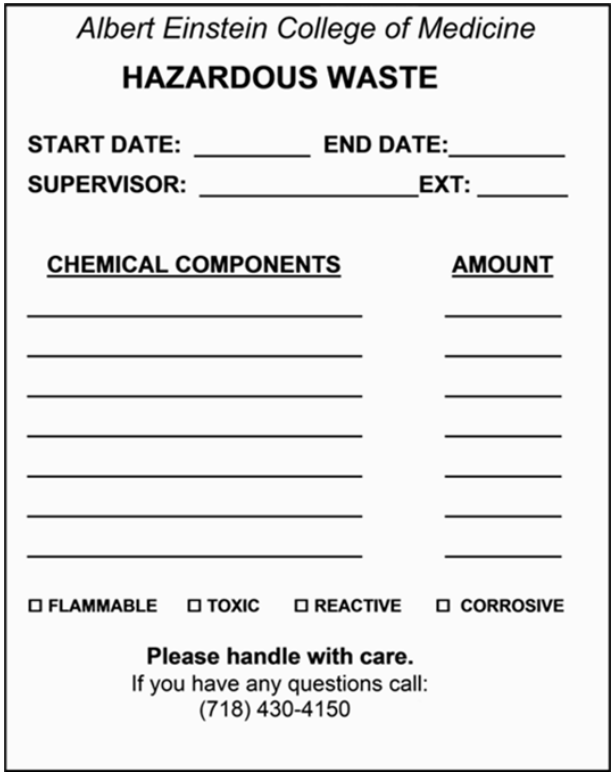
# Chemical Waste – Hazardous Waste Label

- In order to comply with New York Department of Environmental Conservation (DEC) and the USEPA regulations the following must be followed:
- All hazardous waste containers must be labeled with the Hazardous Waste Label, even if the original label is present on the chemical bottle.
- By law, the Hazardous Waste label must:
  - Be on the bottle when the first drop of waste is added
  - Contain the words “Hazardous Waste”
  - Must contain the full name of the chemical(s) on the label
  - Must contain a date
  - Must have one or more of the characteristics checked
- For mixtures, each chemical must be listed



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**HAZARDOUS WASTE**

**START DATE:** _____ **END DATE:**_____

**SUPERVISOR:** _____ **EXT:** _____

| **CHEMICAL COMPONENTS** | **AMOUNT** |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |

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**Please handle with care.**
If you have any questions call:
(718) 430-4150

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# Hazardous Waste label (cont.)

- Hazardous Waste labels can be obtained:
  - From the EH&S office located at Forchheimer 800
  - From the EH&S website at: https://intranet.einsteinmed.edu/download/?token=Lbtqt5eenn3JXZmFK%2b%2f9SGzOqo5Bxvk3vakqYZesGZY
  - **Under no circumstances,** a container labeled with the words "Hazardous Waste" can be disposed in the medical waste bin or general trash.

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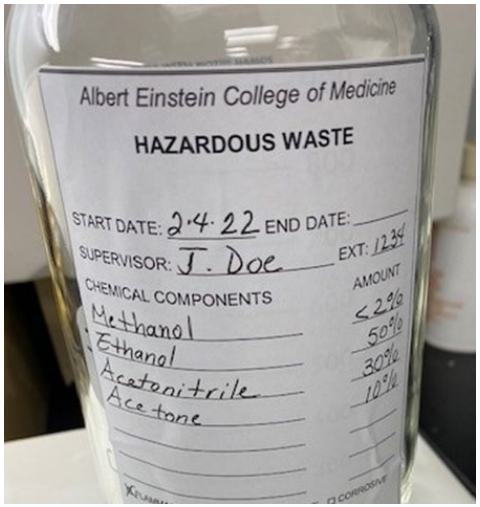
# Hazardous Waste Pick up

- Chemical waste:
  - Must **not** be discarded down the sink or allowed to evaporate in the fume hood.
  - Must be collected in compatible containers labeled with the hazardous waste label.
  - The hazardous waste label must be affixed to the waste container even if the original label is present on the chemical bottle.

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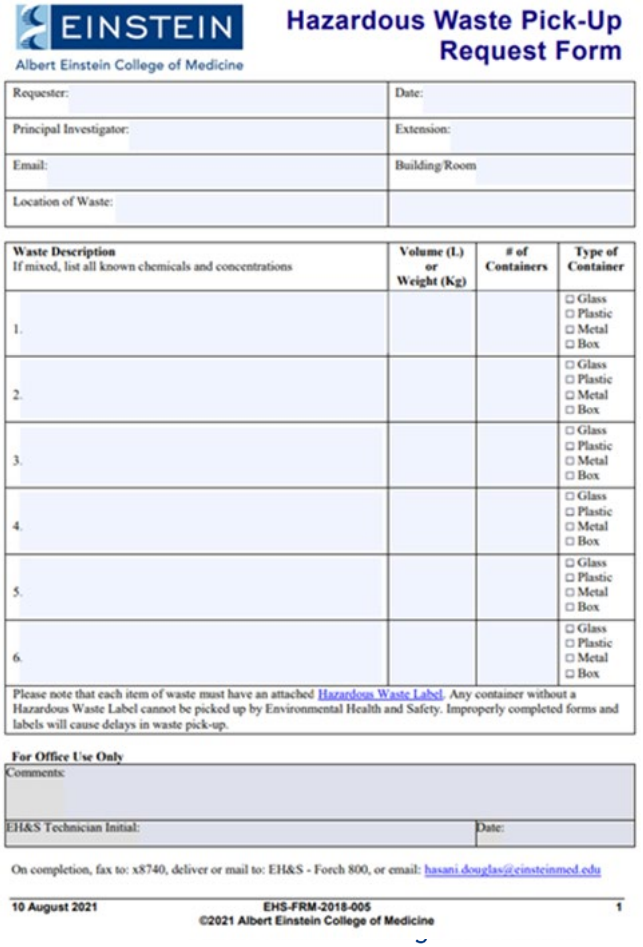
# Chemical Waste Pick up (cont.)

- Chemical waste disposal is FREE.
- Do not dump chemicals down the drain, toss them into general waste, or medical waste bins.
- Do not allow chemicals to evaporate in the fume hoods or in the open laboratory.
- For disposal, complete the hazardous waste pick up form online via the EH&S website at: https://www.einsteinmed.edu/administration/environmental-health-safety/laboratory-safety/chemical-safety/chemical-waste-pick-up-request.asp
- Or download, fill, and submit a copy of the form to Forchheimer 800 by mail or fax (x8740).



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**Hazardous Waste Pick-Up Request Form**

| | |
|---|---|
| Requester: | Date: |
| Principal Investigator: | Extension: |
| Email: | Building/Room |
| Location of Waste: | |

| Waste Description<br>If mixed, list all known chemicals and concentrations | Volume (L) or Weight (Kg) | # of Containers | Type of Container |
|---|---|---|---|
| 1. | | | ☐ Glass ☐ Plastic ☐ Metal ☐ Box |
| 2. | | | ☐ Glass ☐ Plastic ☐ Metal ☐ Box |
| 3. | | | ☐ Glass ☐ Plastic ☐ Metal ☐ Box |
| 4. | | | ☐ Glass ☐ Plastic ☐ Metal ☐ Box |
| 5. | | | ☐ Glass ☐ Plastic ☐ Metal ☐ Box |
| 6. | | | ☐ Glass ☐ Plastic ☐ Metal ☐ Box |

Please note that each item of waste must have an attached Hazardous Waste Label. Any container without a Hazardous Waste Label cannot be picked up by Environmental Health and Safety. Improperly completed forms and labels will cause delays in waste pick-up.

**For Office Use Only**

| | |
|---|---|
| Comments: | |
| EH&S Technician Initial: | Date: |

On completion, fax to: x8740, deliver or mail to: EH&S - Forch 800, or email: hasani.douglas@einsteinmed.edu

10 August 2021 EHS-FRM-2018-005 1

# Consolidating Chemicals

To decrease the number of waste bottles in the lab, the following chemicals may be consolidated in the same bottle:

- Acetone
- Acetonitrile
- Benzene
- Cyclohexanone
- Ethanol
- Ethyl acetate
- Ethylbenzene
- Isopropanol
- Methanol
- Methyl ethyl ketone
- Nitrobenzene
- Toluene
- Xylene

When a new waste chemical is introduced into the waste container, write the full name of the chemical(s) on the hazardous waste label.

- **Note:** Flammable waste will count toward the flammable limit in the laboratory.

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# Disposal of Empty Containers

- Before disposing of empty chemical bottles or containers, make sure:
  - Chemical containers are completely emptied. Be sure that there is no residual material in the container.
  - Have been rinsed **three times,** with the first rinse collected as hazardous waste.
  - Have the **label** removed, **obscured,** or marked "EMPTY".
  - Disposed in the general trash.
- If the container is in good condition, consider reusing the container to collect waste chemicals or recycle to another lab that may need bottles.
- Waste chemicals should be compatible with the container and the original contents of the container.
- If you are unable to remove any residual amount of chemical in the container, the container must be disposed of as hazardous waste.
- Call EH&S at X4150 for information on disposal of acutely hazardous chemical containers.


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# Segregation of Chemicals

- Mixing of incompatible materials (chemicals or wastes) can result in excessive heat, over pressurization, fire or other dangerous situations.
- **Never mix incompatible chemicals or wastes.**
- A compatibility chart is available at the link below:

https://ors.od.nih.gov/sr/dohs/Documents/General_Chemical_Storage_Compatibility_Chart.pdf

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# Gel Containers

- Used for high amounts of Acrylamide and/or Ethidium Bromide (EtBr) gels.
- Place gels in a black 5-gallon bucket lined with a plain plastic bag. **DO NOT** use a biohazard bag.
- Do not place any other wastes besides gel in the 5-gallon container. All wastes (gloves, paper towels, tubes, etc.) can be disposed in medical waste bin.
- Buckets must stay closed and labeled with the hazardous waste label with the words Ethidium Bromide.
- Fill a Hazardous Waste Pick Up form online via the EH&S website at: https://www.einsteinmed.edu/administration/environmental-health-safety/laboratory-safety/chemical-safety/chemical-waste-pick-up-request.asp

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# Chemotherapy Waste

All waste derived from chemotherapy must be discarded as hazardous waste.

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# Mixed Waste

- Mixed waste is normally a mixture of radioactive, biological and/or chemical wastes.
- Removal and disposal of mixed waste is expensive and requires special handling.
- According to the hierarchy of mixed waste, radiological properties, when present, are the most important factors used to determine proper waste handling, followed by chemical properties, then biological properties.
- If your research involves generating this type of waste, you should contact the Radiation Safety Officer (RSO) or the Biosafety Officer for additional disposal procedures and information.

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# Mixed Waste Examples

- Aqueous radioactive wastes with trace levels of chloroform or toxic heavy metals
- Chemical and biological
  - Animal tissues in formalin
- Chemical with Radiological
  - Scintillation vial in with dry solid
- Biological with Radiological
  - Radioactive animals
- Halogenated waste with non-halogenated waste
- Lab supplies mixed with chemical or radiological
  - Gloves or tubes mixed with gel waste
  - Needles mixed with radiation waste
- Solvents with aqueous waste
  - Buffer solutions mixed with flammables
- Incompatible chemicals
  - Solvents with acids

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# Photographic and Chemical Fixer Disposal

- Photo-processing wastes may contain silver.
- Silver is a toxic heavy metal regulated by the EPA under the Resource Conservation and Recovery Act (RCRA) as a hazardous waste in concentrations exceeding 5 ppm.
- Photographic paper and x-ray film have an emulsion of fine silver halide crystals which is released in excess in the fixer solution.
- The fixer stops the chemical reaction initiated by the developer and the undeveloped silver is released by the film and dissolves in the fixer.
- Fixer used for gel radiography and other film developing procedures will generate enough silver in concentrations which prohibits drain disposal.


**Example: Silver Recovery cartridge/bucket**

**Example: Silver Traps**

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# Photographic and Chemical Fixer Disposal

Disposal options of used fixer solutions for laboratories:

1. Run spent fixer through a silver recovery unit which captures the silver and makes the waste non-hazardous by reducing the amount of silver in the solution. Once the material has gone through a silve recovery unit the remaining solution can be disposed of in the drain

**Or**

2. Collect, label, and transfer used fixer via EH&S.

Silver Recovery Unit

Silver recovery cartridge/bucket

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# X-Ray Film Disposal

**Developed X-Ray films** can be disposed of in the regular trash.

**Undeveloped X-Ray films** contain high levels of silver and must be treated as hazardous waste.

- Fill out Hazardous Waste Label, place it on the box, and request a hazardous waste pick up.
- Complete the hazardous waste pick up form online via the EH&S website at: https://www.einsteinmed.edu/administration/environmental-health-safety/laboratory-safety/chemical-safety/chemical-waste-pick-up-request.asp
- Or download, fill, and submit a copy of the form to Forchheimer 800 by mail or fax (x8740).

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**HAZARDOUS WASTE**

**START DATE:** 8/29/2022 **END DATE:** 8/29/2022

**SUPERVISOR:** Dr. Doe **EXT:** 1234

| CHEMICAL COMPONENTS | AMOUNT |
|---|---|
| Undeveloped X-Ray Film | |
| | |
| | |
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| | |

EXAMPLE

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**Please handle with care.**
If you have any questions call:
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# Radioactive Waste Disposal

- Minimize generation
- Identify and segregate waste
  - Long term (H-3 and C-14)
  - Intermediate (S-35 and I-125)
  - Short lived (P-32)
- Use sink disposal limits
- Complete waste request for pick up in iLab
- Keep disposal records


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# Waste Segregation

Separate:

- Dry waste
- Liquid waste
- Liquid Scintillation Vials
- Mixed waste
- Sharps
- Animal Carcasses
- Decayed waste

**All waste must be separated by isotope, except for $^{3}H$ & $^{14}C$**

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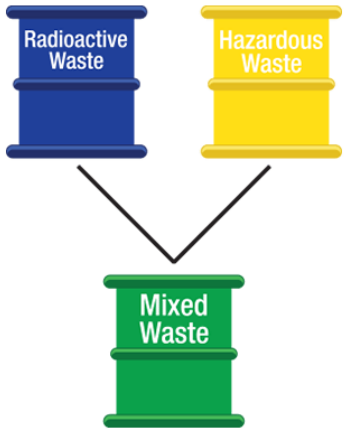
# Mixed Waste Examples

Try to avoid generating this type of waste – it is very expensive to do so




**Examples:**

- P-32 labeled GTP in chloroform = toxic
- C14 labeled acetic acid = corrosive
- Tritiated benzo(a)pyrene in ethyl acetate = flammable

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# Radioactive Waste

**DO NOT** dispose of radioactive waste in:

- Medical waste containers
- General waste containers

**Must** be disposed of in:

- A radioactive waste container provided by EH&S or in a lined shielded container


5 gal. container

10 gal. container

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# Holding Radioactive Waste for Decay

- Waste must be separated by radioisotope into different containers (Except for $^{3}H$ & $^{14}C$)
- Provide appropriate shielding for the waste.
- Seal the container to prevent individuals from adding waste.
- Label the waste container with the radioisotope, the amount of radioactive material, and the date the container was sealed.
- Radioisotopes with half-lives >90 days cannot be held for decay
- Hold for 10 half-lives

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# Minimum Decay Time Examples

| Isotope | Half-life | 10 Half-lives | Rule of Thumb |
|---|---|---|---|
| P-32 | 14.3 days | 143 Days | 6 months |
| Cr-51 | 27.7 days | 277 Days | 1 year |
| I-125 | 59.6 days | 600 Days | 2 years |
| S-35 | 87.4 days | 874 Days | 2.5 years |

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# Discarding Decayed Waste

- **After 10 half-lives** survey the waste with a Geiger counter or Sodium Iodide detector - The readings should not be over background (~0.02 mR/hr).

- If no residual radiation is detected, complete a Radioactive Waste pick-up request in iLab. For “waste type” put Decayed Waste.

- EH&S will pick up the decayed waste.

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# Liquid Scintillation Vials

- These are your wipe test vials. Try and use a  biodegradable scintillation cocktail fluid
- Place in a separate container from the dry solid radioactive waste.
- Ensure the caps are secured tightly on the bottles.
- Do not overfill the container.
- Complete a Radioactive Waste pick-up request in iLab.

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# Do Not Mix Waste Types

- Do not place liquid scintillation vials into dry solid waste containers.
- Do not place radioactive sharps into dry solid waste containers.
- Do not place liquid waste containers into dry solid waste containers.

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# Sharps Container


Be sure not to cover the biohazard labels on the container!


- Must be labeled with “caution-radioactive material” label.
- Waste include syringes, needles, razors, etc.
- Only H-3 & C-14 can be mixed in together, all other radioisotopes must be placed in their own sharps container.

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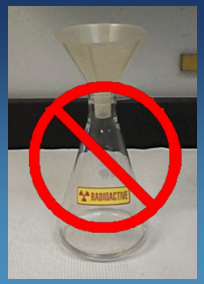

# Collecting Liquids

- Use a durable plastic bottle.
- Attach a radiation warning label to the bottle.
- **Document the isotope, activity, and date on the container.**
- Always secure the lid on the container.
- Place bottle in a secondary container.

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# Sink Disposal of Liquids

- Permitted for small amounts of radioactive material in **aqueous solution only**.
- Discard only in a **labeled** sink.


- Limited to a specific amount per month, with daily averages.
- May need to hold $^{32}P$ for decay prior to discarding down the sink. Can create a "hot area"

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# Sink Disposal of Liquids (cont.)

- Each isotope has two limits for the disposal of radioactive material down the sink.
  - The monthly limit which is a maximum amount that must not be exceeded by the Principal Investigator.
  - The daily limit which is an average amount that should be used as a guideline for the amount that may be discarded down the drain per day.

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# Sink Disposal of Liquids (cont.)

| Isotope | Monthly Limit (uCi) | Daily Limit (uCi) |
|---|---|---|
| P-32 | 360 | 12 |
| S-35 | 300 | 10 |
| I-125 | 360 | 12 |
| Cr-51 | 1500 | 50 |
| C-14 | 900 | 30 |
| H-3 | 360 | 12 |

- The above quantities may be discarded into a designated laboratory sink
- Document disposal on both:
  - Radioactive Material Inventory Form (for the specific stock vial)
  - Sink Disposal Log

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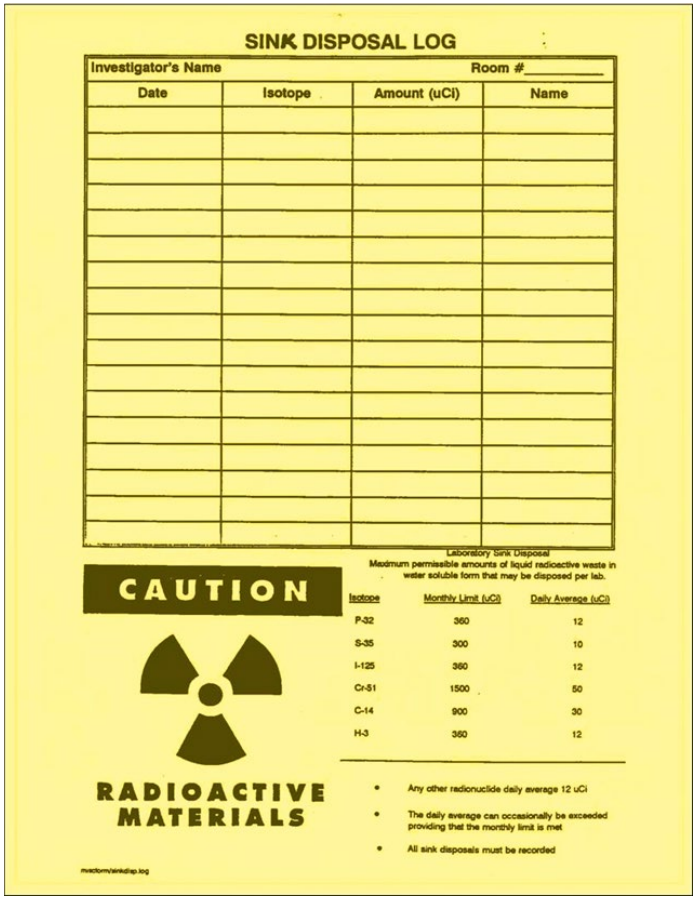
# Sink Disposal Log



SINK DISPOSAL LOG

Investigator's Name Room #_____

| Date | Isotope | Amount (uCi) | Name |
|---|---|---|---|
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CAUTION

RADIOACTIVE MATERIALS

Laboratory Sink Disposal

Maximum permissible amounts of liquid radioactive waste in water soluble form that may be disposed per lab.

| Isotope | Monthly Limit (uCi) | Daily Average (uCi) |
|---|---|---|
| P-32 | 360 | 12 |
| S-35 | 300 | 10 |
| I-125 | 360 | 12 |
| Cr-51 | 1500 | 50 |
| C-14 | 900 | 30 |
| H-3 | 360 | 12 |

- Any other radionuclide daily average 12 uCi
- The daily average can occasionally be exceeded providing that the monthly limit is met
- All sink disposals must be recorded

mvaform/sinkdisp.log

Each time radioactive material is disposed of down the sink, write in :

- The date
- The radioisotope
- The amount in uCi
- Your name

Do not throw out log once full!

Print new logs from Einstein website

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# Disposal of Large Quantities of Liquid Waste

Radioactive waste that cannot be discarded down the sink due to its high radioactive content or hazardous properties may be disposed of in the following manner:

1. Collect in a durable container with lid & submit a radioactive waste pick-up request in iLab. Label the container properly.

2. Hold the waste for decay, then dispose of in designated sink.
   - Only if half-life is <90 days
   - Only if liquid is not hazardous
     - Flammable, corrosive, toxic, reactive

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# Animal Carcasses / Animal Bedding

**Animal Carcass** waste depends on if long lived or short-lived isotopes were used:

**Short-lived isotopes: <90-day half-life**

> Animal carcasses can be held for 10 half-lives in a freezer and then discarded as medical waste.

**Long-lived isotopes: >90-day half-life**

> The concentration of the radioisotope must be considered in animal carcasses containing H-3 or C-14:

- If the concentration is less than (<) 0.05 microcuries/gram of animal (µCi/g), the animal carcass is considered non-radioactive and can be disposed of as medical waste.
- If the activity is greater than (>) 0.05 µCi/g of animal, the carcasses are considered radioactive and must be stored frozen until picked up by EH&S. Contact EH&S if storing this waste.

** Follow the same procedures for biological waste such as tissue samples or waste contaminated with blood or bodily fluids (including animal bedding).*

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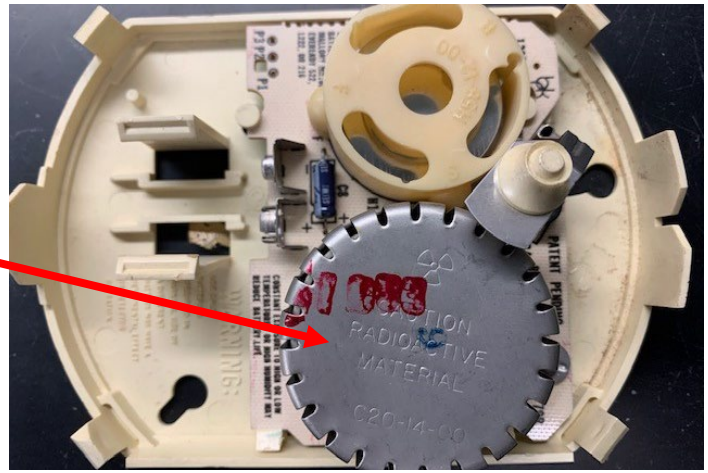
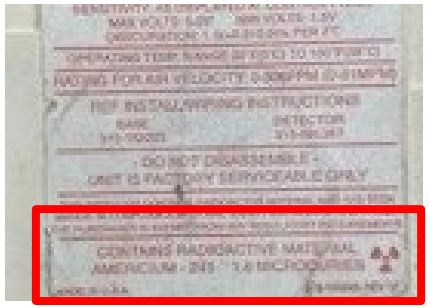
# Smoke Detectors

- Some smoke detectors contain a radioactive source.
- If you see a radiation symbol on the smoke detector (usually on the back), contact EH&S for disposal.
- If you don't see any radioactive markings, the detector may be disposed of as universal waste.



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# Universal Waste


- Universal Waste Rule established by EPA in 1995.
- The Universal Waste Rule permits certain hazardous wastes to be managed under streamlined requirements that encourage the collection, recycling or disposal of certain wastes and reduce the burden of the generator when reporting hazardous waste.
- Although still considered "hazardous," this "Universal Waste" rule provides for reduced management and record keeping requirements regarding these specific wastes.


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# Universal Waste

- **Batteries**, such as nickel-cadmium (Ni-Cd), small, sealed lead-acid batteries, and lithium-ion batteries, which are found in many common items, including electronic equipment, cell phones, portable computers, power tools, and emergency backup lighting;
- **Agricultural pesticides** that have been recalled or banned from use, are obsolete, have become damaged, or are no longer needed due to changes in cropping patterns or other factors.
- **Mercury-containing equipment (MCE),** including thermostats, thermometers, and other devices, which can contain as much as 3 grams of liquid mercury and are found in almost any commercial, industrial, agricultural, community, and household buildings; and
- **Lamps**, which can contain mercury and other heavy metals, such as fluorescent, high-intensity discharge (HID), light-emitting diode (LED), neon, mercury vapor, high-pressure sodium, and metal halide lamps found in businesses and households.
- **Aerosols,** on December 9, 2019, the USEPA added hazardous waste aerosol cans to the universal waste (UW) rule.

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# Examples of Universal Waste

- Fluorescent and high intensity discharge lamps, neon, mercury vapor, high pressure sodium, and metal halide lamps
- Batteries
- Mercury thermostats
- Certain pesticides
- Computer monitors



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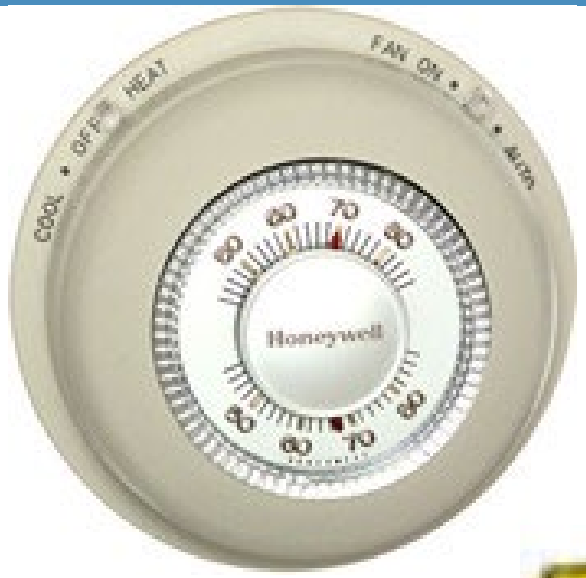
# Universal Waste



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# Alkaline Batteries

- Alkaline batteries are common everyday batteries used in products such as alarm clocks, calculators, flashlights, TV remote controls, radios, remote-control products, children's toys, flashlights, and other items.
- Alkaline batteries no longer contain mercury (check label to confirm) and can be discarded in regular trash.
- They are not harmful to the environment and the cost of actual recycling far outweighs the benefit.

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# Rechargeable and Single-use* Batteries

- **Rechargeable Batteries**
  - Contain toxic metals that can be released into the environment when improperly disposed.
  - Disposal is managed under the NYS Rechargeable Battery Law, Article 27, Title 18 of the Environmental Conservation Law and the USEPA and makes it **illegal** for any person to throw rechargeable batteries in the trash.
  - Commonly found in cordless power tools, cordless phones, cordless vacuums, laptops, cellphones, cameras, two-way radios, biomedical equipment, etc.
  - Include Nickel-cadmium (Ni-Cd), sealed lead, Lithium ion (Li-ion), Nickel metal hydride, any other dry cell battery capable of being recharged, and battery packs containing any of the above-mentioned batteries.

- ***Single-use batteries**
  - Are not reusable when they lose their charge. They are commonly found in musical greeting cards, remote controls, car keyless entry remotes, watches, hearing aids, flashlights, smoke detectors, toys. etc.


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# Rechargeable and Single-use Batteries Collection

- Rechargeable batteries must be removed and disposed of properly.
- Each rechargeable battery must be individually placed in a separate plastic bag or place non-conductive tape (e.g., electrical tape) over the battery's terminal.
- Bring the rechargeable batteries to the EH&S Office located in Forchheimer 800.
- Or take the rechargeable batteries to a SAFE Event, Special Waste Site or Call2Recycle


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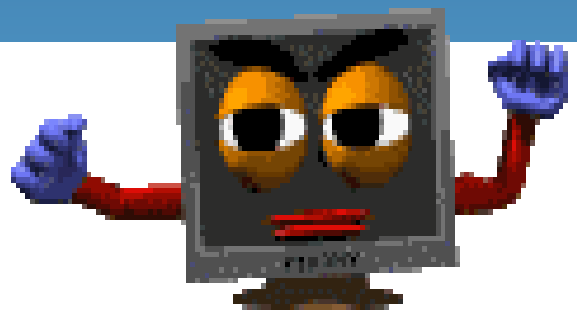
# Computer Monitors

- Computers contain hazardous materials such as lead and other metals therefore, they can not be disposed in the ordinary trash.
- It is illegal to include electronic devices with trash or recycling. Under New York State law, disposing of electronics (TVs, computer monitors, peripherals, etc.) with recyclables or trash is subject to a $100 fine.
- Complete a Housekeeping Workorder to remove all computer equipment.



| Electronics may contain hazardous substances such as: | |
|---|---|
| Cellular phones → | beryllium |
| Computers → | brominated flame retardants |
| Computer equipment → | cadmium |
| Stereo equipment → | chromium |
| Televisions → | lead |
| | mercury |
| | nickel |
| | zinc |

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# Refrigeration Units

- Refrigerants and Freon™ - equipment containing refrigerants must be reclaimed and recycled. Examples include refrigerators, freezers, air conditioning units, etc.
- Freon™ is an ozone depleting chemical and federal and state laws require to be reclaimed.
- Einstein reclaims all refrigerants from old or nonfunctioning units and reuses it in other refrigeration equipment in other areas of the college.


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# Examples of Refrigeration Units


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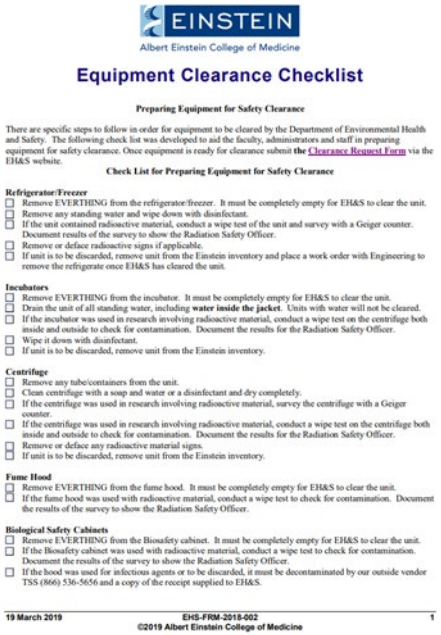
# Disposal of Refrigeration Units

- The refrigerator or freezer unit must be cleaned and disinfected by laboratory personnel or a representative of the principal investigator's department.
- Call extension 2573 to have the unit removed from the Einstein inventory.
- Request refrigeration unit clearance by completing the refrigeration section of the "Equipment Clearance Checklist" (https://intranet.einsteinmed.edu/download/?token=nQySt6mPnRx4Tfizz6Gd0MoU9pk0ZxOYAgKGjTNA1zk)
- Once checklist is completing, submit the on-line "Clearance Request Form" to obtain clearance. (https://einstein.yu.edu/administration/environmental-health-safety/radiation-safety/clearance-request.aspx).



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**Equipment Clearance Checklist**

**Preparing Equipment for Safety Clearance**

There are specific steps to follow in order for equipment to be cleared by the Department of Environmental Health and Safety. The following check list was developed to aid the faculty, administrators and staff in preparing equipment for safety clearance. Once equipment is ready for clearance submit the Clearance Request Form via the EH&S website.

**Check List for Preparing Equipment for Safety Clearance**

**Refrigerator/Freezer**
- ☐ Remove EVERTHING from the refrigerator/freezer. It must be completely empty for EH&S to clear the unit.
- ☐ Remove any standing water and wipe down with disinfectant.
- ☐ If the unit contained radioactive material, conduct a wipe test of the unit and survey with a Geiger counter. Document results of the survey to show the Radiation Safety Officer.
- ☐ Remove or deface radioactive signs if applicable.
- ☐ If unit is to be discarded, remove unit from the Einstein inventory and place a work order with Engineering to remove the refrigerate once EH&S has cleared the unit.

**Incubators**
- ☐ Remove EVERTHING from the incubator. It must be completely empty for EH&S to clear the unit.
- ☐ Drain the unit of all standing water, including **water inside the jacket**. Units with water will not be cleared.
- ☐ If the incubator was used in research involving radioactive material, conduct a wipe test on the centrifuge both inside and outside to check for contamination. Document the results for the Radiation Safety Officer.
- ☐ Wipe it down with disinfectant.
- ☐ If unit is to be discarded, remove unit from the Einstein inventory.

**Centrifuge**
- ☐ Remove any tube\containers from the unit.
- ☐ Clean centrifuge with a soap and water or a disinfectant and dry completely.
- ☐ If the centrifuge was used in research involving radioactive material, survey the centrifuge with a Geiger counter.
- ☐ If the centrifuge was used in research involving radioactive material, conduct a wipe test on the centrifuge both inside and outside to check for contamination. Document the results for the Radiation Safety Officer.
- ☐ Remove or deface any radioactive material signs.
- ☐ If unit is to be discarded, remove unit from the Einstein inventory.

**Fume Hood**
- ☐ Remove EVERTHING from the fume hood. It must be completely empty for EH&S to clear the unit.
- ☐ If the fume hood was used with radioactive material, conduct a wipe test to check for contamination. Document the results of the survey to show the Radiation Safety Officer.

**Biological Safety Cabinets**
- ☐ Remove EVERTHING from the Biosafety cabinet. It must be completely empty for EH&S to clear the unit.
- ☐ If the Biosafety cabinet was used with radioactive material, conduct a wipe test to check for contamination. Document the results of the survey to show the Radiation Safety Officer.
- ☐ If the hood was used for infectious agents or to be discarded, it must be decontaminated by our outside vendor TSS (866) 536-5656 and a copy of the receipt supplied to EH&S.

19 March 2019 EHS-FRM-2018-002 1
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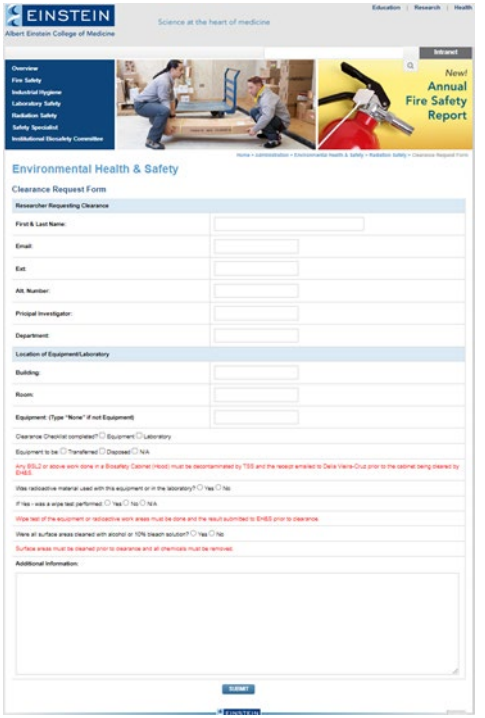


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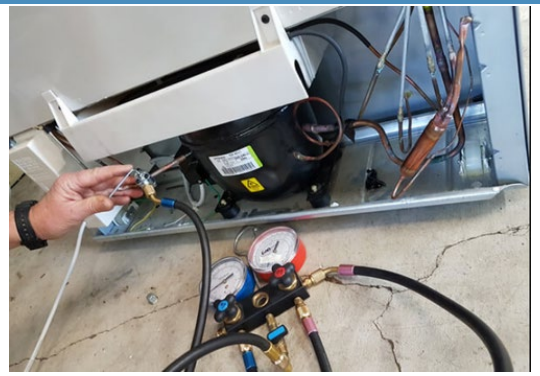
# Disposal of Refrigeration Units (Continued)

If a refrigeration unit is being disposed, request clearance after completing the checklist.

Once EH&S has provided clearance, the laboratory or administrator must:

1. Submit a work order to the Engineering department to have the refrigerant from the unit reclaimed/removed.
2. Submit another work order to Housekeeping to have the unit removed from the laboratory and dispose of in the construction compactor.



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# Paints

Paint can be toxic and dangerous to the environment if it's not disposed of properly. Most paints are composed of resins, solvents, pigments, and additives.

- ✓ **Resins** – Typically a non-hazardous component; includes linseed, acrylic, or synthetic resins; it is the main ingredient and forms a coating or films on the surface being painted.
- ✓ **Solvents** – Keep the paint in liquid form until solvent evaporates after application; solvents in oil-based paint may contain mineral spirits, toluene, and xylene;
- ✓ **Pigments** – Provide color and covering power; major pigments presently used (considered non-toxic) include titanium oxide, iron oxide, calcium sulfate, clay, or silicates; high-colored pigments may contain heavy metals such as chromium, cadmium, or arsenic.

  Paints purchased prior to 1977 may contain lead (poisonous, heavy-metal) in the pigment.
- ✓ **Additives** – include stabilizers that prevent paint deterioration in the can, dryers to assist in formation of paint coating, thickeners to aid in application, and preservatives to inhibit growth of molds;

  Additives can range in composition including both hazardous and non-hazardous ingredients.

  - Some latex paints contain mercury-based fungicide preservative.
  - Mercury-containing paints produced since 1990 must be labeled "exclusively for exterior use".

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# Paints (Continued)

- Water-based Paints:
  - Latex paints are water-based and generally non-hazardous.
  - Considered least harmful. However, latex paints produced pre-1992 may contain mercury.
- Oil-based Paints:
  - Including enamel, lacquer, shellack and varnish contain solvents.
- Hobby or artist coloring paints may contain solvents or heavy metals.
- Aerosols:
  - Spray paints containing solvents and propellants.
  - Can now be managed as a Universal Waste.


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# Paint Disposal

- There are general steps to be followed for the disposal of latex and oil-based paints:
- Water-based / Latex Paint
  - Air dry excess paint on plastic or cardboard and discard in the regular trash, **or**
  - Add equal parts of clay-based cat litter, saw dust, or absorbent material to the latex paint can. Stir the clay-based cat litter or saw dust until the paint thickens and will not spill. Allow the mixture to sit for at least two days or until completely dry. Once dry, toss in the regular trash.
- Oil-based Paints
  - Must be disposed as a hazardous waste.
  - Label as hazardous waste, contact EH&S at extension 4150 to coordinate/schedule pick up by our hazardous waste vendor.
- *Use all the paint or arrange for usable leftover paint to be donated to organizations, friends, neighbors, community centers, places of worship, local theaters, Habitat for Humanity, ReStore, etc.*

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# Paints Disposal - Aerosol Paint

- Aerosol Cans/Aerosol Paint
  - *Aerosol means a non-refillable receptacle containing a gas compressed, liquified, or dissolved under pressure, with the sole purpose to expel a liquid, paste, or powder and fitted with self-closing release device allowing the contents to be ejected by the gas.*
  - USEPA added aerosol cans to the list of Universal Waste in February 2020.
  - All liquid must be removed by normal means (spraying the contents during use of product) and have no more than one inch or 3% by weight of residue remaining.
  - Used/empty cans must be collected in a structurally sound, leak-proof container, compatible with the contents of the cans, and in good condition (i.e., 55-gallon drum).
  - Accumulation container must be labeled or marked clearly with any of the following phrases: “Universal Waste – Aerosol Can(s),” “Waste Aerosol Can(s),” or “Used Aerosol Can(s)”.
  - Call EH&S at extension 4150 to coordinate and schedule pick up by our hazardous waste vendor.

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# Solvents, Paints and Used Rags Disposal

- All rags containing paint thinner, brushes used with oil-based paints, or regulated metal pigments must be treated and disposed as a hazardous waste.
- These rags must be disposed in a metal container with a closed lid.
- Container must be marked as “Used Rags” and contain the “hazardous waste” label.
- Call EH&S at extension 4150 to coordinate/schedule pick up by our hazardous waste vendor.



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# Used Oil

- Used oil is “any oil that was refined from crude oil or any synthetic oil, that is used and as a result of such use, contaminated by physical or chemical impurities.”
- Examples include lubricants, hydraulic fluids, heat transfer fluids.
- Containers and tanks used to collect the used oil must be kept in good condition.
- Do not allow tanks or containers to rust, leak, or deteriorate.
- Containers must be kept closed unless you are adding waste.


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# Used Oil (Continued)

- Containers used for the collecting of Used Oil can be brought down to hazards waste room in Belfer B07 and consolidated into the labeled oil drum.
- The consolidation container used to collect used oils must be labeled with the words “Used Oil.”
- EH&S will coordinate with the waste vendor to remove the used oil drum.



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# Used Oil (Continued)

- At oil collection sites, keep absorbent materials available. If a leak or spill occurs, stop the oil from flowing.
- Contain spilled oil using absorbent berms or by spreading absorbent over the oil and surrounding area.
- If a leak cannot be stopped, put the oil in another holding container or tank.
- Call EH&S at extension 4150 for additional information.


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# Contact Information

Department of Environmental Health & Safety

Forchheimer 800

(718) 430-4150

https://einsteinmed.edu/administration/environmental-health-safety/

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