

APPENDIX 10

DARKROOM WASTE MANAGEMENT POLICY

Darkroom Waste Management Policy

The photographic developing process involves many types of chemicals. Many of the common processes used generate hazardous waste. For example spent fixer often contains silver, which is regulated under the Resource Conservation and Recovery Act (RCRA). Unused chemicals such as stop bath are acidic, and are also regulated under RCRA. The following policy outlines procedures for managing dark room waste to ensure compliance with federal, state, and local environmental regulations.

1. Unused Photographic Chemicals

- a. All unused photo chemicals should be disposed of through REHS. Please review the Waste Management section of this policy and the [Hazardous Waste Disposal Policy and Procedure](#) in your chemical hygiene guide for more information on managing your chemical waste.
- b. If a chemical is still in good condition, and may be used in another department REHS will add it to the chemicals for reuse inventory.

2. Used/Spent Photographic Solutions

- a. Spent Developer: Many developers contain hydroquinone and sodium sulfite. These may be drain disposed; however, all photographic waste generated at University locations with a septic system, such as research stations and farms, must be collected in containers and disposed of through REHS.
- b. Spent Fixer: Most spent fixing solutions contain silver. If you do not use a silver recovery system, or have a septic system, the spent solution is regulated and must be managed as hazardous waste. If you have a septic system, you must collect the spent fixer, regardless if you use silver recovery equipment or do not use silver recovery equipment. This waste material must be collected in containers and disposed of through REHS.

Please see Silver Recovery Section of this policy.
- c. Intensifiers, reducers, and toners: These may contain a variety of toxic compounds such as mercuric iodide, potassium cyanide, cyanide salts, carbon tetrachloride, or heavy metals such as selenium, gold, or lead. These items must be collected in containers and disposed of through REHS.
- d. Other Spent Solutions: Most other solutions may be drained disposed; however, the pH must be between 5 and 9 and they must not be regulated. **Please contact REHS for approval before drain disposing chemicals.**

Table 1: Waste Management Options

WASTE TYPE	Darkroom On Public Sewer	Darkroom On Septic
Unused Photographic chemicals	Dispose of through REHS	Dispose of through REHS
Spent Developer	If non-hazardous drain dispose (contact REHS for classification)	Dispose of through REHS
Spent Fixer <u>with out</u> Silver recovery System	Dispose of through REHS	Dispose of through REHS
Spent Fixer <u>with</u> Silver Recovery System	Drain dispose. Ensure system is properly maintained and working	Dispose of through REHS

3. Waste Minimization

- a. Purchase nontoxic, non-hazardous alternative photographic chemicals.
- b. In order to minimize waste, please reuse or recycle materials whenever possible.
- c. Consider employing a silver recovery system.
- d. Donate unused and/or unwanted chemicals to the REHS chemicals for reuse inventory.

4. Silver Recovery

- a. Silver recovery equipment must be maintained in a frequency, which ensures the proper capture of silver.
- b. Documentation of maintenance must be kept on file for three (3) years to confirm the equipment is functioning properly. These records should be kept by personnel responsible for the darkroom equipment or purchase orders such as the P.I., department chair, or department administration. They must also be made available to regulatory agencies and/or REHS upon request during an inspection
- c. The vendor responsible for servicing the equipment must use the "Silver Recovery Maintenance Log" in Attachment A.
- d. The silver recovered from the unit must be transported by the vendor on a Bill of Lading or other Shipping Paper, and not a Hazardous Waste Manifest. Shipping papers must be kept for three years, and be made available to regulatory agencies and/or REHS upon request during an inspection.

5. Waste Management

- a. Waste chemicals must be collected in individual, leak proof, sealed containers. The chemicals must be compatible with container material (*e.g.* acids must not be placed in a metal container). Glass containers may be safely used for virtually anything except hydrofluoric acid, acid fluoride salts, and very strong alkalis.
- b. Waste chemicals must not be placed in an unwashed container, which contains any incompatible residual material, from previous chemical storage.
- c. Select the smallest container available that will properly hold the material, allowing sufficient headspace above the surface of the liquid to allow room for expansion. This is economical and efficient. Five-gallon carboys, pails, and fifty-five-gallon drums are available from REHS as required. Do not use your own drums or pails without prior approval from REHS; they may not meet US Department of Transportation requirements.
- d. Any containers holding a hazardous chemical or waste shall be kept securely closed, so there is no escape of hazardous waste or its vapors during storage, except when it is necessary to add or remove chemicals or waste. Ensure that lids, bungs, or rims are tightly in place.
- e. See Section IV of the Hazardous Waste Disposal Policy and Procedure for additional Waste Treatment, Drain Disposal and Waste Minimization information.

6. Waste Container Labeling

- a. All containers must be clearly identified and labeled with the chemical name(s) of the substance(s) at the immediate time when the collection starts. Trade names, acronyms, abbreviations, codes, or formulas **are not acceptable**.
- b. All hazardous waste, which cannot be recycled because it is either spent, past the manufactures expiration date, or has been mixed or contaminated with another substance **must be labeled with** a Rutgers University black and white HAZARDOUS WASTE

LABEL. This label must be affixed to the container before any waste material is placed into the container. It is also acceptable to write the words "HAZARDOUS WASTE" on the original manufacturer's label. Note the later is only acceptable if the chemical is in its original container. Hazardous waste labels may be obtained by calling REHS. **Waste Labeling (or writing the words "Hazardous Waste" on the manufacturers label) must not be completed on bottles containing pure chemicals, as these materials may be recycled by redistribution.**

- c. The concentration of each chemical or mixture component must be identified on the label. The units of concentration must be on the label together with their numerical values. When the solute is either a liquid or gas, the concentrations **may not** be expressed in percentages, but must be stated as either a **weight percent** or a **volume percent**. For containers being filled with varying concentrations of a variety of compatible materials, the chemical concentrations can be added to the label when the container is full.
- d. The hazardous waste label must have all of the darkroom contact information completed.

Please note: Non-RCRA regulated waste that is being collected because drain disposal is not permitted or prior to drain disposal does not need a Hazardous Waste Label. Collection containers should be marked with the contents and concentrations (e.g. Spent Developer, 100%).

7. **Unidentified Waste:**

State and federal transportation regulations for waste haulers prevent REHS from collecting substances that are unidentified (unknown). The responsibility for establishing the identity of an unknown substance rests with the department wishing to dispose of it. Upon request, REHS will furnish the names of state-certified analytical laboratories.

8. **Satellite Accumulation Areas:**

- a. Hazardous waste must be stored in the darkroom Satellite Accumulation Area (SAA), at or near the point of generation and under the control of the operator generating the waste. Typically there is an SAA in each darkroom. REHS will assist with the determination of appropriate locations for satellite accumulation areas.
- b. Chemical wastes must be segregated by general waste type (e.g. flammables, poisons, acids, and alkalis) and arranged so that incompatible substances cannot mix. Incompatibles are those pairs of substances that, when mixed, either react violently or evolve flammable or poisonous gases or vapors. Below are a few general principles that must be followed for safe hazardous waste storage and chemical storage:
 - 1. Keep acids and bases apart.
 - 2. Keep acids apart from cyanides or sulfides
 - 3. Acids should never be put into steel containers.
 - 4. Water-reactive, strong acids such as organic acid halides, organic acid anhydrides, inorganic acid anhydrides, and strong acidic salts must be kept apart from both alkalis and water.
 - 5. Oxidizing agents must be kept apart from reducing agents and organic compounds.
 - 6. Water-reactive agents must be stored apart from water, aqueous solutions, and acids.
 - 7. Air-reactive materials must be packed in containers that are sealed off from the atmosphere.
 - 8. Explosive and shock-sensitive materials present special risks that require special handling. Consult with REHS before handling or preparing for disposal.
- c. Hazardous waste must be stored in secondary containment. Incompatible materials must not be stored in the same secondary containment bin.
- d. Containers must be arranged so that identification is readily visible.

- e. State and federal regulations allow up to fifty-five gallons of hazardous waste, or one quart of acutely hazardous waste (for more information on acutely hazardous waste see section II of the Hazardous Waste Disposal Policy and Procedure) in a Satellite Accumulation Area (SAA). Once accumulation limits are met containers must be dated with the start date excess accumulation begins. At the time when the limit is reached, excess waste must be removed from the SAA within three days.

Attachment A

Silver Recovery Maintenance Log

Silver Recovery Maintenance Log

Note: This log must be kept on file for three years from the last date of service listed.

Date/Time of Service	Name of Service Company	Name of Service Technician	Type of Service Performed	Quantity of silver bearing material removed for reclamation	Signature of Service Technician