

Lewis & Clark College
Policy and Procedure

Subject: Hazardous Waste Program **Policy No.:** _____

Division: Business and Finance

Department: Facilities Services

Original Effective Date: March 29, 1994 **Date(s) Reviewed/Revised:** May 23, 1998

Approved By: _____ **Approval Date:** _____

Purpose: To protect the environment from chemical wastes generated in conjunction with various College activities. To comply with the Environmental Protection Agency, Oregon DEQ, and other agencies regulations regarding the generation, storage, treatment, and disposal of hazardous wastes.

Policy Statement: Lewis & Clark College desires to support the preservation of Oregon's natural environment. All hazardous wastes generated in the course of educational and operational activities of the College shall be accumulated, stored, and disposed in a manner which avoids discharge to the environment and which meets federal, state, and local regulatory requirements. No hazardous wastes shall be accumulated, stored, or removed from Lewis & Clark College premises without prior notification of the Lewis & Clark College Occupational Health and Safety Officer.

Procedures: All personnel conducting work on the premises of Lewis & Clark College will follow these procedures regarding the disposal of hazardous and potentially hazardous waste materials. All personnel are specifically prohibited from the dumping of potentially hazardous materials into sewer drains, soil, or evaporation into the air without the prior approval of the Lewis and Clark College Occupational Health and Safety Officer. The procedures for the disposal of waste materials to be followed will

be determined by the location in which the potentially hazardous wastes are generated. Disposal actions for chemical wastes generated by the instructional

and experimental activities of the Science Departments will follow the Chemistry Department Hazardous Waste Management Plan maintained by the Laboratory Director of the Chemistry Department and the Biology Department Hazardous Waste Management Plan maintained by the Laboratory Coordinator of the Biology Department. Disposal actions for radioactive wastes generated by instructional, experimental, and maintenance activities at the College will follow the Health Physics Procedures maintained by Lewis & Clark Radiation Safety Officer. Disposal actions for all other wastes generated by all other departments of the College will be in accordance with the general waste disposal procedures outlined in Section III below.

I. CHEMISTRY DEPARTMENT HAZARDOUS WASTE MANAGEMENT PLAN PROCEDURES:

A. Separation and Accumulation of Wastes:

1. Liquid waste materials will be separated into three categories: organics, corrosives, and inorganics. The organic wastes may be halogenated or nonhalogenated; the pH of the organics should be close to neutral ($5 < \text{pH} < 9$). If the pH is not close to neutral, the waste should be neutralized using sodium hydroxide, hydrochloric acid (or another suitable acid or base). If the waste is strongly acidic or basic and is not easily neutralized, it should be classified as corrosive. The corrosive wastes shall consist of all wastes (organic or non organic) that are strongly acidic or basic. The inorganic wastes may contain heavy metals or any of the other inorganic wastes listed above (except strong acids or bases). The pH of the inorganic wastes is not critical as they will be stored in a polypropylene drum.
2. In general, wastes shall be accumulated in the labs in labeled glass waste bottles (separated into the appropriate categories). The generator is responsible for knowing what compounds are being added to the waste bottles. An inventory sheet should be used to track which wastes go into each bottle. The inventory sheet should

list the principal components of the waste. However, all heavy metals, highly toxic compounds, and carcinogens should also be listed.

3. As bottles become full, they shall be taken to the Cage. In the Cage, there will be three drums: a 30 gallon steel drum for organic waste (pH must be close to neutral), a 10-15 gallon polypropylene drum for inorganic waste, and a 10-15 gallon polypropylene drum for corrosive waste. On each drum, there will be an inventory sheet. The waste shall be transferred to the appropriate drum and the addition shall be logged on the inventory sheet. The waste bottle itself may be reused. Wastes accumulated in the teaching labs shall be transferred to the drums on a weekly basis by the students whose job is solution preparation.

4. The drums in the Cage shall be disposed of as they become full or after a period of six months, whichever comes first. Currently, the chemistry department is using Spencer Environmental Services as its hazardous waste handler.

5. Empty from most of the chemicals may be disposed of as non hazardous waste. Empty containers from acutely toxic chemicals (40 CFR 261.5) must be triple rinsed with an appropriate solvent prior to disposal. The contaminated solvents must be treated as hazardous wastes.

6. Solid wastes shall be stored in bottles labeled with the contents, the generator, and the date generated. When possible, a solid waste should dissolved in an appropriate solvent and disposed of as a liquid waste.

B. Treatment and Disposal of Wastes Via the Sewer System:

1. It is permissible to dispose of some wastes via the sewer system. Other wastes may be treated in the laboratory to render them non hazardous at which time they may be disposed of via the sewer system. In general the quantities of the chemicals must be small; to wit, not more than a few hundred grams or milliliters. The chemicals must not contain more than traces of other

compounds which are considered to be hazardous (i.e. below local limits). The following lists some compounds which may be disposed of via the sewer systems:

- a. Organics which are reasonably soluble in water such as acetone, ethanol, and isopropanol.
- b. Dilute solutions of inorganics in which neither the cation nor the anion pose a significant hazard.
- c. Mineral acids and alkalis. Acids and bases should be neutralized prior to disposal unless $5.5 < \text{pH} < 8$.

All of the above will be disposed of with large amounts of running water which will ensure that concentrations are less than permissible levels as defined on the attached Portland lists.

II. HEALTH PHYSICS PLAN PROCEDURES:

A. Preparation:

1. For waste not sent to an authorized radioactive materials disposal facility, remove or deface all radioactivity labels from containers and packages prior to disposal. If waste is compacted, all labels that are visible in the compacted mass must be defaced or removed.
2. Ensure that non radioactive waste such as leftover reagents, boxes, and packaging material are not mixed with radioactive waste.
3. Periodically review all procedures to ensure that radioactive waste is not created unnecessarily. Review all new procedures to ensure that waste is handled in a manner consistent with established procedures.
4. In all cases, consider the entire impact of various available disposal routes. Consider occupational and public exposure to radiation, other hazards associated with the material and routes of

disposal (e.g., toxicity, carcinogenicity, pathogenicity, flammability), and expense.

Lewis & Clark College is encouraged to reduce the volume of waste sent to shallow-land burial sites. Important steps in volume reduction are to segregate radioactive from non radioactive waste, to hold short lived radioactive waste for decay in storage, and to release certain materials into the sanitary sewer systems in accordance with OAR 333 - 104 - 205 and upon the approval of the Radiation Safety Officer.

B. Disposal Procedure:

1. Liquids and Gases: liquids may be disposed of by release to the sewer systems or by release to the atmosphere only on the approval of the Radiation Safety Officer. Rules for disposal in the sanitary sewer system appear in OAR 333 - 104 - 205. Material must be readily soluble or dispersible in water. There are daily and monthly limits based on the total sewerage released by the College. The Radiation Safety Officer shall ensure these limits are not exceeded.
2. Disposal by Decay in Storage (DIS): Radioactive materials with a half-life of less than 65 days may be disposed of by DIS. These short lived materials must be kept separate from other radioactive materials. The following procedures will be followed in DIS:
 - a. Containers for DIS materials must not provide any radiation shielding since the containers must be surveyed with approved radiation survey meters. When the container is full it will be sealed and labeled with the longest-lived radioisotope in the container, the total activity of the container, the estimated date of disposal, and the initials of the person sealing the container.
 - b. The material shall have decayed for at least 10 half-lives
 - c. Monitored with a properly tested radiation detection survey meter.

d. When the container cannot be distinguished from background radiation, the container may be disposed of in the regular trash. The container will have additional labeling indicating date sealed, the disposal date, and type of material present added. No radiation labels will be affixed or visible.

3. Transfer for Burial: Except for material suitable for DIS and some animal carcasses, solids must be transferred to a burial site. The packaging instructions received from the transfer agent and the burial site operator will be followed in all regards. The College currently uses U.S. Ecology of Richland, Washington for this service.

III. GENERAL CAMPUS DISPOSAL PROCEDURES:

The following procedure applies to all other departments and campus organizations of Lewis and Clark College outside the Chemistry, Biology, and Physics departments. The Occupational Health and Safety Officer is responsible for these waste disposal operations.

1. Disposal Determination: The department generating the waste shall determine whether or not a material poses a hazard to environment. The criteria for this determination will be based on a careful reading of product labeling and review of the applicable Material Safety Data Sheets (MSDS). Where applicable, all materials on the Lewis & Clark College campus shall have an associated MSDS on file with the Lewis & Clark College Occupational Health and Safety Officer. Materials are to be considered hazardous if either the label or MSDS indicates any of the following characteristics:

a. *Toxicity*: the material is poisonous, carcinogenic, or mutagenic in either the short term or long term.

b. *Flammability*: the flash point of the material is less than 100 degrees F.

c. *Explosion potential*: the material is potentially explosive in its normal physical state.

d. *Reactivity*: the material is chemically unstable or bears specific reactivity warning labels regarding contact with other materials or is identified as an oxidizer.

e. *Corrosiveness*: the material is labeled as either an acid or alkali or has a pH of less than 5.5 or greater than 8.0.

f. *Biologically Hazardous Material*: Materials containing known pathogenic microbes likely to cause disease in human beings.

If the generating department is in doubt as to whether the material they wish to dispose of constitutes a hazardous waste, they will contact the Occupational Health and Safety Officer for final determination.

2. *Waste Preparation*: No material is considered to be a waste until the determination is made by the Occupational Health and Safety Officer. Prior to disposal, these materials will be placed in sturdy, leak proof containers. Steel containers are preferred, except for corrosive materials which should be placed in polypropylene containers. The container must be sealed and labeled. The label must identify contents, the generating department, and desired disposal date. Label nomenclature must agree with that on the material safety data sheet.

3. *Disposal*: The Facilities Services department will be contacted to remove containers of potentially hazardous waste. These containers will be transported to an on-campus holding facility and an approved hazardous waste disposal company contacted by the Occupational Health and Safety Officer for disposal. In some cases, an approved hazardous waste disposal company may be contacted by the Lewis & Clark College Occupational Health and Safety Officer to remove hazardous material directly from the generating location.

IV. PROCEDURES FOR WASTE DISPOSAL VIA METRO HAZARDOUS WASTE FACILITY:

1. Discussion: As Lewis & Clark College is a Conditionally Exempt Generator, certain small quantities of hazardous wastes may be disposed of through the Metro Hazardous Waste Facility. As the College must transport these materials itself the following procedures are different from those applied when using a licensed and approved commercial hazardous waste hauler as outlined above.
2. Material Identification: The generating department will send a list of those materials which they desire to dispose of to the Occupational Health & Safety Officer. The items will be listed by chemical/product nomenclature which is identical to the container labelling. A Material Safety Data Sheet (MSDS) for each item will accompany the list. The list will provide the following information:
 - a. Common, trade, or brand name of the material.
 - b. The waste stream/process which generated the waste.
 - c. The chemical name(s) of hazardous ingredients (from the MSDS) as well as the percent of each ingredient by mass or volume.
 - d. The type and size of the container.
 - e. How full the container is.

EXAMPLE:

Common Name	Waste Stream/Process	Hazardous Ingredients (% by wt. or vol.)	Number, Size, & Type Containers	How Full
Miller paint thinner (used)	Spray paint booth	Mineral Spirits (28%)	1-55 gallon steel drum	3/4
Potassium permanganate	Chem lab reagent	Potassium permanganate (99%)	3-100 mg glass beakers	full
Kodak film developer	Photo lab	Silver nitrate (12%)	4-10 oz. plastic bottles	0.25
Formalin	Bio preservative	Formaldehyde (37%)	2-5 L. plastic drums	1/2
		Methanol (15%)		
Quik-N-Kleen Degreaser	Auto Shop	Acetone (10-12%)	1-10 oz. aerosol can	Unk
		Isobutane (10-15%)		
		Mineral Spirits (12-14%)		
		Propane (7-8%)		
Allied pH adjuster	Swimming pool	Calcium carbonate (67%)	4-50 lb. paper sacks	full
Unkown	Groundskeeping	Believed to be old herbicide	1-25 lb. metal can	Unk
		Label no longer legible		
		Label no longer legible		

3. *Metro Liaison:* The Occupational Health & Safety Officer will be the College's point of contact with Metro and will provide all required inventories of wastes to that organization. Once an inventory has been accepted by Metro, no further items will be added. The inventory must exactly match what is delivered.
4. *Material Preparation:* Materials will be prepared for shipment either personally by the Occupational Health & Safety Officer or under his direct supervision. Any materials packed outside his view must be unpacked and reinventoried prior to transportation.
5. *Items Rejection:* **No explosives or blasting agents, chemically unstable materials, physically unstable materials, highly reactive materials, radioactive materials, or any material precluded from non-commercial transportation by federal, state, or local regulation will be accepted.**

V. FUNDING FOR WASTE DISPOSAL; GENERAL CONSIDERATIONS:

Under no circumstances shall waste material from sources outside the College be transported, stored, or treated at the College. Costs for waste disposal shall be borne by the College entity which generates the waste. It is suggested that such costs be considered prior to purchasing or using materials in a process which may generate hazardous waste.

In consultation with the waste generating entity, the Occupational Health and Safety Officer shall determine the most efficient, effective, and economical method for final disposal of generated waste.