University of Hawaii ❖ Kaka'ako – JABSOM/UHCC
Hazardous Material Management Program
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Table of Contents

1.0	Introduction	Page 2
2.0	Management of Hazardous Chemical Material	Page 2
2.1	Approval to Purchase Certain Hazardous Chemicals	Page 2
2.2	Agreement for Use of Hazardous Materials	Page 2
2.3	Inventory of Hazardous Material	Page 2
2.4	Audit Program	Page 3
3.0	Hazardous Waste Disposal Requirements	Page 3
3.1	Waste Generator Responsibilities	Page 3
3.2	Mandatory Hazardous Waste Generator Training	Page 3
3.3	Establishment of a Satellite Accumulation Area	Page 4
3.4	Waste Containers	Page 4
3.5	Labeling	Page 4
3.6	Secondary Containment	Page 5
3.7	Hazardous Material & Hazardous Waste Turn-in Form	Page 5
3.8	Hazardous Waste Disposal Costs	Page 5
3.9	Spill and Emergency Response Plans	Page 6
3.10	Specific Information on the Disposal of Various Materials	Page 7
3.10(a)	Aerosol Cans	Page 7
3.10(b)	Batteries	Page 7
3.10(c)	Biological Materials	Page 8
3.10(d)	Compressed Gases	Page 8
3.10(e)	Controlled Substances	Page 8
3.10(f)	Fluorescent Light Ballasts	Page 8
3.10(g)	Fluorescent Light Tubes	Page 8
3.10(h)	Hazardous Chemicals and Hazardous Waste	Page 8
3.10(i)	Mercury	Page 9
3.10(j)	Mixed Waste	Page 9
3.10(k)	Non-Hazardous Waste	Page 9
Table 1	Non-Hazardous Waste	Page 10
Table 2	Drain Disposal Restrictions	Page 10
3.10(l)	Oils and Transformer Fluid	Page 11
3.10(m)	Radioactive Materials	Page 11
3.10(n)	Sharps and Glass	Page 11
3.10(o)	Abandoned Waste	Page 12
4.0	Hazardous Waste Minimization	Page 12
4.1	Buying Chemicals in Smaller Amounts	Page 12
4.2	Recycling and Redistribution	Page 12
4.3	Use of Less Hazardous or Non-Hazardous Materials	Page 13
4.4	Conversion to Non-Hazardous Materials	Page 13
Attachment 1	Procurement Authorization for Hazardous Materials	
Attachment 2	List of Acutely Hazardous Waste (P-coded Waste)	
Attachment 3	Hazardous Materials and Hazardous Waste Turn-in Form	

HAZARDOUS MATERIAL MANAGEMENT PROGRAM

1.0 INTRODUCTION:

The Hazardous Waste Management Program (HMMP) provides information on requirements for the management of hazardous materials, including the disposal of hazardous waste. These requirements are based on Federal, State of Hawaii, City & County of Honolulu, and University of Hawaii regulations. Failure to comply with these requirements may subject the University and/or individuals to fines, and civil or criminal prosecution. In addition, the proper management of hazardous materials is necessary to reduce disposal costs. While the disposal of all material as hazardous waste is expensive, there are certain materials that require special attention to minimize the difficulty and expense of their disposal. A copy of the HMMP along with other useful information is available online at the JABSOM Office of Environmental Health & Safety website.

2.0 MANAGEMENT OF HAZARDOUS CHEMICAL MATERIAL:

Compliance with the following requirements will assist JABSOM Office of Environmental Health and Safety (EHS) in ensuring the proper management of certain types of hazardous chemicals. Our hazardous material management strategy is divided into four parts: Approval to purchase, safety in use, inventory control, and audits.

2.1. Approval To Purchase Certain Hazardous Chemicals:

EHS approval is required for the purchase or requisition of the specific chemicals listed on the Procurement Authorization for Hazardous Material form, Attachment (1). This form must be completed and submitted to EHS for approval prior to initiating a purchase order for any of the materials on the list. The purpose of EHS approval is to enable us to assist you in ensuring the safe storage, handling and disposal of the material while minimizing cost to the University.

2.2. Safety In Use:

Certain hazardous materials require Standard Operating Procedures (SOPs) to ensure the safe use and storage of these materials. The University Chemical Hygiene Plan (CHP) provides requirements for SOPs and describes the specific types of material covered.

2.3. Inventory of Hazardous Material:

Each laboratory/facility is required to maintain a total chemical inventory per the Chemical Hygiene Plan (CHP). A copy of the inventory must be available for review at the laboratory/facility. An updated inventory must be updated on BioRAFT ChemTracker at least annually.

2.4. Audit Program:

EHS has established an audit program to assist in maintaining laboratories and facilities that are safe and protective of the environment. EHS will periodically visit laboratories and facilities to review the implementation of applicable safety, health and environmental policies and requirements. The following topics will normally be covered: training, personal protective equipment, emergency equipment, fume hoods, hazardous material storage, survey for highly hazardous materials or acutely hazardous waste, Safety Data Sheet (SDS) availability, hazardous waste accumulation areas, and emergency plans. A report indicating any necessary corrective actions and suggested improvements will be provided. The inspection checklists are available for review on the JABSOM EHS website.

3.0 HAZARDOUS WASTE DISPOSAL REQUIREMENTS:

The following requirements apply to all generators of hazardous waste.

3.1. Waste Generator Responsibilities:

The following outlines waste generator responsibilities.

- Become familiar with the hazardous materials you use and the policies covering hazardous materials and hazardous waste management.
- Comply with waste requirements. Store and label waste properly, complete the waste turn-in form correctly.
- Complete initial and annual waste generator training.
- Contact EHS, if in doubt about the requirements or how to properly dispose of waste.

3.2. Mandatory Hazardous Waste Generator Training:

Initial and annual refresher training is required for hazardous waste generators (if you work with, purchase, or bring on site hazardous chemicals, you may anticipate generating hazardous waste and should therefore be considered as a hazardous waste generator*). The purpose of the training is to familiarize waste generators with EPA requirements and UH JABSOM policies and procedures. Training is site specific to JABSOM Facilities, i.e., the Manoa training does not apply to JABSOM and vice versa. Initial and annual refresher training is a web-based training available through BioRAFT. Training information is available at JABSOM EHS website. Principal Investigators (PI) have the primary responsibility for the storage and disposal of excess hazardous material and waste in the laboratories. The PI has the responsibility to ensure that all persons who generate waste know the basic requirements for waste disposal and that the satellite accumulation area is periodically monitored to verify that requirements are met. *If a PI determines that a student or volunteer will be always supervised by a trained individual, then the PI can determine that the student or volunteer does not need to complete the hazardous waste generator training.

3.3. Establishment of a Satellite Accumulation Area (SAA):

Each generator shall establish an identifiable area, with a posted area for the collection of waste. The area must be at or near the point of generation of the waste (i.e., in the same room or in a connecting room where the waste is being generated); should be neat and orderly; containers must be labeled and must be closed except when waste is actively added to them; containers should not be stacked upon one another; containers of liquid should not be stored on their side. The SAA must be clearly defined and material that is not waste cannot be in the SAA.

Waste may be accumulated in the lab/facility/workshop **until**:

- 50 kg has been accumulated and/or;
- 500 g of Acutely Hazardous (P-coded) waste* has been accumulated and/or;
- 6 months has passed.

If ANY of these limits are reached, contact EHS immediately.

*A list of Acutely Hazardous (P-coded) wastes is provided in Attachment (3).

3.4. Waste Containers:

Containers used for wastes must be in good condition (i.e., not rusting, without cracks or structural defects). If a container is broken or begins to leak, the material must be transferred to a container in good condition. The material composition must be compatible with the material to be stored and incompatible materials must not be stored in the same container. Containers must have a secure closure (e.g., screw cap). Parafilm, glass or rubber stoppers are not considered secure closures. Liquids must be stored in containers with tight fitting, screw top lids. Containers of liquid waste must not be "overfilled"; the maximum amount of liquid in the container must not exceed 90% of its capacity.

3.5. Labeling:

All waste material shall be labeled with the word "waste" and the chemical name(s) of the waste (e.g., "waste methyl alcohol" or "waste ethidium bromide"). Generic names can be used ONLY IF a separate list is maintained to indicate the chemical names and the approximate amounts (e.g., "waste chlorinated solvent bottle no. 1" with a separate list "Bottle no. 1=Chloroform 50%, Methyl Chloroform 40%, Methylene Chloride 10%").

Chemicals which are unused or only partially used, in original containers and which cannot be used by others in the department do not have to be labeled as waste; the manufacturer's label or a label giving the chemical name and specific hazards (e.g., flammable, corrosive or poison) is acceptable.

3.6. Secondary Containment:

Secondary containments are required for containers of liquid waste under the following circumstances:

- When the waste is stored in 55-gallon drums.
- When the waste is stored on the floor.
- When the waste is stored in a hood which has a drain.
- When the waste is stored within four (4) feet of a sink.
- When necessary to separate incompatible or high hazard wastes.

Plastic tubs can be used as secondary containments. EHS should be consulted about secondary containments for 55-gallon drums.

3.7. Hazardous Material & Hazardous Waste Turn In Form:

Complete the waste turn in form, an excel file, and email it to JABSOM EHS. The form can be downloaded from the JABSOM EHS website. Instructions are included in the file.

3.8. Hazardous Waste Disposal Costs:

The cost of hazardous waste disposal for JABSOM Campus is borne by the Environmental Health and Safety Office with no charge to the generator of the waste, except for the following:

- **Unknown Waste**: a charge of $200 for each container of unknown waste is assessed to cover the cost of analysis. Waste cannot be legally disposed of unless it has been identified.
- **Radioactive Mixed Waste**: wastes which are both naturally radioactive (e.g., Uranium or Thorium compounds) and a regulated waste (e.g., nitrates or flammable solvents) are very expensive to dispose. In the past the cost of 10 pounds of radioactive mixed waste was $30,000. Reimbursement of EHS disposal costs will be charged to the department generating the waste.
- **Compressed Gas Cylinders**: Compressed gas cylinders that are not empty, have frozen valves or which contain unknown, highly toxic or reactive gases present difficult and expensive disposal problems. One lecture bottle sized cylinder can cost from $500 to $3000 and cylinders whose contents are unknown can cost $10,000 or more for disposal. Reimbursement of EHSO disposal costs will be charged to the department generating the waste. There is no charge for the disposal of empty cylinders of common gasses, but cylinders with frozen or non-operational valves cannot be considered empty. EHS can assist researchers or Departments in making arrangements with environmental disposal companies, but the cost of the disposal must be borne by the researcher or Department that has the cylinders.

- **Dioxin or Dioxin Contaminated Materials**: materials containing Dioxin (dibenzodioxins or dibenzofurans) must be disposed at one approved site in the continental U.S. which is only infrequently open or exported to a disposal site in Canada. This involves substantial costs, approximately $1,000 per pound and special permits. Reimbursement of EHS disposal costs will be charged to the department generating the waste.

3.9. Spill and Emergency Response Plans:

Specific spill response plans and training in the plans are necessary for the chemicals stored and handled in the lab. Emergency procedures and emergency phone numbers should be clearly posted in the work area. Personnel working with hazardous chemicals should be able to answer the question: **"What would I do if this material spilled?"** Spill kits with instructions, sorbents, neutralizers, and protective equipment should be available to clean up minor spills. A minor spill is one that does not spread rapidly, does not endanger people or property except by direct contact, does not endanger the environment, and the workers in the area are capable of handling safely without the assistance of safety and emergency personnel. All other chemical spills are considered major.

The following are general spill and emergency response procedures:

1. Attend to anyone who may have been contaminated or hurt if it can be done without endangering yourself.
2. Ensure that the fume hoods are on and open windows if it can be done without endangering yourself.
3. If flammable materials are spilled, de-energize electrical devices if it can be done without endangering yourself. Be sure to turn off devices before unplugging devices.
4. If the spill is major, contact **JABSOM Security (692-0911/1911)** and **EHS (692-1854/1855**.
5. If the spill is minor, clean up can be performed as follows:
    a. Select and don the appropriate personal protective equipment (PPE) (ensure it is resistant to the spilled material).
    b. Neutralize acids and bases, if possible, using neutralizing agents such as sodium carbonate or sodium bisulfate.
    c. Control the spread of liquids by containing the spill.
    d. Absorb liquids by adding appropriate sorbent materials, such as vermiculite or sand, from the spill's outer edges toward the center. Paper towels and sponges may also be used as sorbent material, but this should be done cautiously considering the character of the spilled material. If you have any questions regarding spill cleanup, contact EHS.
    e. If a dusty or fine-powdered material is spilled, avoid creating dusts. If the chemical does not react with water, consider placing a dampened paper towel

over the spill to decrease dust generation. If you have any questions regarding spill cleanup, contact EHS.

f. Collect and contain the cleanup residues by scooping it into a plastic bucket or other appropriate container and turn-in to EHS as hazardous waste.

g. Decontaminate the area and affected equipment. Ventilating the spill area may be necessary.

h. Document what happened, why, what was done, what was learned, and contact EHS if a hazardous chemical was spilled. Such documentation and discussion can be used to avoid similar occurrences in the future. Major incidents are almost always preceded by numerous near misses.

6. Emergency plans for fire. If the fire is small and can be easily extinguished using a fire extinguisher and does not involve flammable liquids or hazardous material in circumstances where the spread of the fire is likely (e.g., a fire in a trash container). Fight the fire and notify PI and EHS after the fire is extinguished. If the fire is other than small, activate the fire alarm and evacuate the area, notify JABSOM Security (692-0911/1911), EHS (692-1854/1855), and the PI.
7. Emergency plans for explosion. Activate the fire alarm and evacuate the area. Notify JABSOM Security, EHS, and PI.

For more information about spill and emergency response, go to the JABSOM EHS website.

3.10. Specific Information on the Disposal of Various Materials:

The individual possessing or generating the material retains the primary legal responsibility for the material. EHS provides information on requirements and assistance in handling the materials. Specific information on various types of materials is provided below.

3.10(a) Aerosol Cans:

Aerosol cans (e.g., paint cans, WD-40, or other aerosol products) whether full or empty shall be turned in to EHS for disposal.

3.10(b) Batteries:

EHS will accept for disposal lithium, nickel/cadmium, or mercury batteries. EHS will accept lead/acid batteries used in research or in equipment, but the batteries must be removed from the equipment prior to submitting to EHS for disposal. EHS will NOT accept "household type" batteries alkaline/carbon-zinc (flashlight, "C", "D", "AA") for disposal. Under current Honolulu City and County regulations Alkaline or Carbon-Zinc batteries can be disposed of as ordinary trash. Vehicle batteries are recyclable and arrangements with local vendors can be made. Disposal of batteries from University vehicles is handled by Transportation Services.

3.10(c) Biological Materials:

Contact EHS. Contact EHS for metal sharps and pathological waste.

3.10(d) Compressed Gases:

Compressed gas cylinders should be returned to the vendor. A return agreement with the vendor should be included in the contract or service agreement. Without such an agreement the return or disposal of the cylinders is difficult and very costly.

3.10(e) Controlled Substances:

The handling and disposal of controlled substances (i.e., drugs and other substances listed in 21 CFR 1308) are the responsibility of the license/permit holder. EHS cannot accept controlled substances for disposal.

3.10(f) Fluorescent Light Ballasts:

The Facilities Management Office (FMO) removes non-leaking ballasts. Ballasts that contained PCBs are believed to have already been removed from University light fixtures. Contact EHS for assistance concerning leaking ballasts or any known to contain PCBs.

3.10(g) Fluorescent Light Tubes:

The FMO removes and disposes of fluorescent light tubes. FMO also removes and replaces UV lights from UH owned equipment. Specialty lamps used in research (e.g., UV lamps, Halogen lamps, Atomic Absorption spectral lamps) can be submitted to EHS for disposal; if removed by the FMO, ensure they give the spent lamps to EHS for disposal.

3.10(h) Hazardous Chemicals and Hazardous Waste:

EHS will pick-up excess hazardous chemicals and hazardous chemical waste from within the JABSOM facilities. The completion of a hazardous material and hazardous waste turn in form is required for pick-up by EHS. The form and instructions can be downloaded from the JABSOM EHS website. Efforts should be made to determine if excess hazardous chemicals can be used by others in the facility, contact EHS for assistance. Contact EHS about waste at JABSOM facilities outside of the Kaka'ako campus (e.g., Gold Bond).

The following requirements must be completed before EHS will pick-up your waste:

1. You must have completed the JABSOM Waste Generator Training (initial and annual refresher). We cannot pickup waste from persons who do not have current training.
2. You must submit a copy of the Hazardous Material & Hazardous Waste Turn-in form in advance to EHS for review and approval. Email the completed form to kakaako-ehso@lists.hawaii.edu. Upon approval, a mutually convenient time for pick-up will be arranged.

3. Each chemical container must be properly labeled. Labels should clearly identify contents with specific chemical names (no abbreviations or chemical formulas) and the percentage or relative amounts of each major chemical constituent.
4. Containers constructed of compatible material and must be sealed and in good condition. Liquids must be in screw top containers.
5. Incompatible materials shall be segregated.

If you have any questions on the proper disposal of hazardous materials or wastes, contact EHS.

Chemicals considered non-hazardous can be disposed of in the municipal sanitary landfill or sanitary sewer ONLY under certain conditions (see "Non-Hazardous Waste" below).

3.10(i) Mercury:

EHS will accept for disposal items containing functional mercury (e.g., light switches, barometers, and thermometers).

3.10(j) Mixed Waste:

Mixed waste is defined as materials that possess a radioactive or biological hazard as well as an unrelated chemical hazard (e.g., potassium dichromate solution contaminated with Carbon-14). Contact the Radiation Safety Officer (956-6475) or Biosafety Program as applicable for assistance in the proper disposal of these materials.

3.10(k) Non-Hazardous Waste:

Listed in Table 1 (below) are typical laboratory chemicals which are not considered hazardous wastes by the U.S. Environmental Protection Agency. If solid and in *plastic* containers, they may be disposed of as ordinary trash. The container must have the chemical name on it and it should be marked "non-hazardous" to mitigate any concern by the refuse collectors. If solid and in *glass* or *metal* containers the material should be transferred to plastic containers, labeled, and marked "non-hazardous." As an alternative, all non-hazardous solid chemicals can be turned in to EHS.

Contact EHS if you have chemicals that you believe may be non-hazardous for a determination as to whether they must be turned in to EHS for disposal or may be disposed of as ordinary trash.

TABLE 1: NON-HAZARDOUS WASTE

Sugars (e.g., sucrose, glucose, mannose)	Sodium, Potassium, Calcium, Strontium, and Ammonium Sulfates	Silica Gel
Starch	Sodium, Potassium, Magnesium and Ammonium Chlorides	Alumina (Aluminum Oxide)
Naturally Occurring Amino Acids	Silicon Dioxide	Calcium Fluoride
Citric Acid and its Sodium, Potassium, Magnesium, Calcium and Ammonium Salts	Boron, Magnesium, Copper Oxides	Lactic Acid and its Sodium, Potassium, Magnesium, Calcium and Ammonium Salts
Sodium, Potassium, Calcium, Magnesium, Strontium and Ammonium Phosphates	Sodium, Potassium, Magnesium and Calcium Borates	Sodium, Potassium, Ammonium Acetates
Sodium, Potassium, Magnesium, Calcium and Ammonium Carbonates		

Non-hazardous liquid chemicals or chemical solutions can only be disposed of to the sanitary sewer (i.e., down the drain) if they are within the scope of the UH JABSOM Industrial Wastewater Discharge Permit. The following general requirements must be met for waste to be disposed of in the sanitary sewer. The waste must meet both the general requirements and be listed in Table 2 or have specific written permission from the EHS Hazardous Material Management Officer. The solution must have a pH between 5.5 and 9.5. No viscous solutions or solutions containing oil are permitted. No solutions at a temperature of greater than 40^{o}C are permitted. No solutions containing ashes, cinders, sand, mud, straw, shavings, metal powder, glass, rags, feathers, tar, plastics, wood, or paper are permitted.

TABLE 2: DRAIN DISPOSAL RESTRICTIONS

Ethidium Bromide Solutions: <0.01% **by weight** and <2 quarts per day per laboratory
Phosphate Buffer Solutions: <10% **by weight** and <1 quart per day per laboratory
Solutions containing sodium azide as a preservative must not exceed 0.01% sodium azide as sodium azide can react with metal plumbing to result in potentially explosive mixtures.
Salt Solutions: <10% **by weight** [(sodium, potassium, lithium, ammonium): (chlorides, carbonates, phosphates, sulfates, or acetates)] < 2 quarts per day per laboratory
Dyes or Stains: Small amounts from slide as part of laboratory experiments. No concentrated solutions or significant volumes.
Alcohol Solutions: (methyl, ethyl, and isopropyl only) <10% **by volume** and <1 quart per day per laboratory

Dilute Formaldehyde Solutions: <3% **by weight** and <1 quart per day per laboratory
10% Buffered Neutral Formalin must be submitted as hazardous waste unless it is treated by an approved technology such as Neutralex.
Sugar Solutions: <10% **by weight** and <2 quarts per day per laboratory
Amino Acids and their Salts in solution: <10% **by weight** and <2 quarts per day per laboratory
Citric and Lactic Acids and their Salts in solution: <10% **by weight** and <1 quart per day per laboratory.
Autoclaved Liquids: Infectious liquids, including but not limited to blood, that have been autoclaved and rendered non-infectious, may be poured down the drain after all solid matter is filtered out and the liquid is allowed to cool. If liquids contain other hazardous components (e.g., chemical hazards, radiological hazards), do not autoclave and contact Kaka'ako EHSO for assistance.

NOTE: The percentage by weight or volume refers to a total of the items in any category. For example, a solution of 5 % sodium chloride and 5 % potassium chloride would meet the limit while a solution of 10% sodium chloride and 5 % potassium chloride would not. Similarly, a solution of 10% ethyl alcohol and 5% methyl alcohol would not meet the criteria for drain disposal. A solution of 10% ethyl alcohol and 10% sodium chloride would meet the criteria as they are in different categories, but the volume permitted per day would be the lower of the two.

Contact EHS if you have chemicals that you believe may be non-hazardous for a determination as to whether they must be turned in to EHS for disposal or may be disposed of in the sanitary sewer in small amounts.

3.10(l) Oils and Transformer Fluid:

EHS will accept waste pump oil. EHS will NOT accept used motor oil. Used motor oil is recyclable through local vendors. Used motor oil from University vehicles is handled by Transportation Services. Transformer fluid will be handled on a case-by-case basis, contact EHS.

3.10(m) Radioactive Materials:

Contact the Radiation Safety Officer (956-6475) for information concerning the proper handling and disposal of radioactive material.

3.10(n) Sharps and Glass:

Refer to the JABSOM Waste Disposal Guidelines on the JABSOM EHS website.

3.10(o) Abandoned Waste:

Abandoned waste should not occur, as the abandonment of waste is a violation of the HMMP. In the event that abandoned waste is discovered, the following policy will be implemented.

- If the waste material is in a building or adjacent to a building such that it can be assumed that the waste came from the building, then the Department/School/College occupying the building is responsible for the disposal of the waste material in accordance with the HMMP.
- If the waste material is in an area such that it is not easily identifiable as having come from a building (e.g., the material is in a dumpster or parking lot), or if a chemical spill is involved, then EHS will respond and dispose of the material as abandoned waste in accordance with the HMMP.

4.0. HAZARDOUS WASTE MINIMIZATION:

4.1. Buying Chemicals in Smaller Amounts:

The "large economy size" may cost less to buy, but disposal costs, in most cases, are several times the initial cost of the material. Many of the bottles of excess or waste chemicals turned in are full or ¾ full. Everyone needs to accurately estimate the amount of chemicals they expect to use.

4.2. Recycling and Redistribution:

Efforts should be made to find someone in the facility who could use the hazardous material before it is turned in to EHS as excess or waste. EHS encourages the redistribution and exchange of surplus chemical products within the UH system as an alternative to disposal as waste. If no qualified user can be found, then the material will be disposed of as hazardous waste. This program will reduce waste generation and save the University waste disposal costs.

4.3. Use of Less Hazardous or Non-hazardous Materials:

The following provides some examples of the use of less hazardous or non-hazardous materials; everyone is encouraged to seek other alternatives to hazardous materials that may be applicable to their research or instructional materials.

4.3(a) Cleaning Solutions:

Chromerge, chromic acid and dichromate cleaning solutions are not desirable from a waste disposal prospective as they cannot be made non-hazardous and are expensive to dispose of. There are many non-toxic, biodegradable cleaning solutions that can be used instead of chromic acid. For extremely dirty glassware, a product called Nochromix, which uses sulfuric acid and an organic oxidizer in place of chromium can be used. While this requires

neutralization of the acid for ordinary disposal, it is far less costly to dispose of than chromium solutions. A number of alternative cleaning solutions are listed: NoChromix, Alconox, Liquinox liquid detergent, Citranox, Fisherbrand sparkleen, and FL-70 Concentrate.

4.3(b) Drying Agents:

The safest common drying agents are calcium chloride, silica gel, molecular sieves and calcium sulfate (Drierite). These are recommended because of their low toxicity and stability. Drying agents that pose varying degrees of hazard and disposal problems include:

- Phosphorus Pentoxide generates highly corrosive phosphoric acid and heat on contact with water and has to be disposed of as a hazardous waste unless it can be reacted and neutralized.
- Magnesium Perchlorate (Dehydrite) is a strong oxidizer and may cause fires or explosions on contact with organic materials and must be disposed of as a hazardous waste.
- Water Reactive Chemicals (materials such as sodium metal, potassium metal, calcium metal, calcium carbide, calcium hydride, lithium hydride, lithium aluminum hydride, sodium hydride and potassium hydride) are not recommended for use as general purpose drying agents because they form flammable gases on contact with water and are both dangerous and expensive to dispose of. Small amounts of these materials can be safely disposed of by reacting them with water under controlled conditions by knowledgeable personnel to create non-hazardous or less hazardous materials. If a bottle of solvent contains a water reactive drying agent, this information must be clearly marked on the bottle. This is necessary for the safety of personnel handling the material during disposal.

4.3(c) Thermometers:

Mercury thermometers should be replaced with non-mercury thermometers whenever possible. Broken mercury thermometers create spills that are a potential health hazard, time consuming to clean up, and are one of the most expensive hazardous wastes we handle. Non-mercury thermometers with equivalent accuracy are available for temperature ranges of -20 to 250^{o}C. Contact EHS or check your laboratory supply catalog for more information. If mercury-containing equipment is used, then mercury spill kit and personnel knowledgeable in its use is required in the laboratory or facility.

4.4 Conversion to Non-hazardous Material:

As part of instruction or research operations, hazardous materials can be converted into non-hazardous wastes. The neutralization of acids or bases is an example of this. Experiments can be designed to convert residual or produced hazardous materials into non-hazardous wastes. In some cases, this can have instructional value as well as reducing the amount of hazardous waste and its disposal cost.

UNIVERSITY OF HAWAII
PROCUREMENT AUTHORIZATION FOR HAZARDOUS MATERIALS

An approved (signed) copy of this form must accompany the purchase order or requisition for the procurement of the hazardous materials listed below.

NAME: _____ (Principal Investigator)

DEPARTMENT: _____ **PHONE:** _____

LOCATION: _____ (Where chemicals will be used)

Chemical Name	Solid/Liquid/Gas	Amount

LIST OF CHEMICALS REQUIRING JABSOM EHS APPROVAL TO PURCHASE:

Because the following chemicals are highly toxic, explosive, water reactive or for other reasons very difficult and expensive to dispose of (disposal costs can be more than $1000 per container) their use needs to be minimized and monitored:

Arsine	Diborane	Methyl Bromide	Rubidium
Boron Trichloride	3,5-Dinitrophenol	Methyl Lithium	Silane
Boron Trifluoride	2,4-Dinitrophenylhydrazine	Nitric Acid (≥68%)	Silane Dichloride
Bromine Chloride	3,5-Dinitrosalicylic Acid	Nitric Oxide	Sodium
Butyl Lithium	Ethylene Oxide	Nitrogen Dioxide	Sulfur Dioxide
Carbon Monoxide	Fluorine	Nitrogen Trifluoride	Thorium Compounds
Carbonyl Sulfide	Hydrogen Bromide	Phosgene	Trinitroaniline
Cesium	Hydrogen Chloride	Phosphine	Trinitrobenzene
Calcium Hydride	Hydrogen Cyanide	Phosphorus	Trinitrocresol
Chlorine	Hydrogen Fluoride	Picfume	Trinitronapthalene
Chlorine Trifluoride	Hydrogen Sulfide	Picric Acid	Trinitrophenol
Chloropicrin	Lithium	Picryl Sulfonic Acid	Trinitrotoluene
Cyanogen	Lithium Aluminum Hydride	Picramide	Uranium Compounds
Cyanogen Chloride	Lithium Hydride	Potassium	Urea Nitrate

In addition to the items listed above, any material which is listed under the United States Department of Transportation (DOT) as hazard class 1 (explosive) or listed under DOT as a packing group I material or is listed as a hazard class 2.3 (toxic gas) requires EHS approval for purchase. Information on DOT Hazard class and packing group is available on the safety data sheet under section 14 Transportation.

Signature of Principal Investigator: _____ **Date:** _____

PLEASE SEND THE COMPLETED FORM TO: JABSOM EHS at 651 Ilalo Street, BSB 112, Honolulu, HI 96813. Lisa Johns, the JABSOM EHS Supervisor, may be contacted at 692-1855 if you have questions.

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FOR EHSO USE ONLY:

EHSO APPROVAL: _____ **Date:** _____
(JABSOM EHS Coordinator)

LIST OF ACUTELY HAZARDOUS WASTE (P-CODED WASTE)

The following materials are hazardous wastes if and when they are intended to be discarded (40 CFR 261.33):

- Any commercial chemical product or manufacturing chemical intermediate having the generic name listed below;
- Any off-specification commercial chemical product or chemical intermediate having the generic name listed below;
- Any residue remaining in a container that is not empty. P-coded containers must have their contents removed and be triple rinsed with an appropriate solvent before they are legally empty and no longer regulated;
- Any residue resulting from the clean-up of a spill of a P-coded waste.
- The phrase "commercial chemical product or manufacturing chemical intermediate having a generic name listed below" refers to a chemical substance which is manufactured or formulated for commercial or manufacturing use which consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulations in which the chemical is the sole active ingredient.

An Excel Table can be requested by emailing kakaako-ehso@lists.hawaii.edu.

Waste Code	CAS#	Item
P023	107-20-0	Acetaldehyde, chloro-
P002	591-08-2	Acetamide, N-(aminothioxomethyl)-
P057	640-19-7	Acetamide, 2-fluoro-
P058	62-74-8	Acetic acid, fluoro-, sodium salt
P002	591-08-2	1-Acetyl-2-thiourea
P003	107-02-8	Acrolein
P070	116-06-3	Aldicarb
P203	1646-88-4	Aldicarb sulfone
P004	309-00-2	Aldrin
P005	107-18-6	Allyl alcohol
P006	20859-73-8	Aluminum phosphide
P007	2763-96-4	5-(Aminomethyl)-3-isoxazolol
P008	504-24-5	4-Aminopyridine
P009	131-74-8	Ammonium Picrate
P119	7803-55-6	Ammonium Vanadate
P099	506-61-6	Argintate (1-), bis(cyano-C-), potassium
P010	7778-39-4	Arsenic acid (H3AsO4)
P012	1327-53-3	Arsenic oxide (As2O3)
P011	1303-28-2	Arsenic oxide (As2O5)
P011	1303-28-2	Arsenic pentoxide
P012	1327-53-3	Arsenic trioxide
P038	692-42-2	Arsine, diethyl-
P036	696-28-8	Arsenous dichloride, phenyl-
P054	151-56-4	Aziridine

P067	75-55-8	Aziridine, 2-methyl-
P013	542-62-1	Barium cyanide
P024	106-47-8	Benzenamine, 4-chloro-
P077	100-01-6	Benzenamine, 4-nitro
P028	100-44-7	Benzene (chloromethyl)-
P042	51-43-4	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-
P046	122-09-8	Benzeneethanamine, alpha, alpha-dimethyl-
P014	108-98-5	Benzenethiol
P127	1563-66-2	7-Benzofuranol, 2,3-dihydro-2-2-dimethyl-, methylcarbamate
P188	57-64-7	Benzoic acid, 2-hydroxy, compd, with (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8- trimethylpyrrolo[2,3-b] indol-5-yl methylcarbamate ester (1:1)
P001	81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%.
P028	100-44-7	Benzyl chloride
P015	7740-47-7	Beryllium powder
P017	598-31-2	Bromoacetone
P018	357-57-3	Brucine
P045	39196-18-4	2-Butanone, 3,3-dimethyl-1-(methylthio)-, o- [methylamino, carbonyl] oxime
P021	592-01-8	Calcium cyanide
P189	55285-14-8	Carbamic acid, [(dibutylamino)-thio] methyl-,2,3-dihydro-2,2-dimethyl-7- benzofuranyl ester
P191	644-64-4	Carbamic acid, dimethyl-, 1-[(diemthylamino)carbonyl]-5-methyl 1H-pyrazol-3-yl ester
P192	119-38-0	Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester
P190	1129-41-5	Carbamic acid, methyl-, 3-methylphenyl ester
P127	1563-66-2	Carbofuran
P022	75-15-0	Carbon disulfide
P095	75-44-5	Carbonic dichloride
P189	55285-14-8	Carbosulfan
P023	107-20-0	Chloroacetaldehyde
P024	106-47-8	p-Chloroaniline
P026	5344-82-1	1-(o-Chlorophenyl) thiourea
P027	542-76-7	3-Chloropropionitrile
P029	544-92-3	Copper cyanide (202CuCN)
P202	64-00-6	m-Cumenyl methylcarbamate
P030	----------	Cyanides (soluble cyanide salts) not otherwise specified
P031	460-19-5	Cyanogen
P033	506-77-4	Cyanogen chloride (CNCl)
P034	131-89-5	2-Cyclohexyl-4,6-dinitrophenol
P016	542-88-1	Dichloromethyl ether
P036	696-28-6	Dichlorophenylarsine
P037	60-57-1	Dieldrin
P038	692-42-2	Diethylarsine
P041	311-45-5	Diethyl-p-nitrophenyl phosphate
P040	297-97-2	O, O-Diethyl O-pyrazinyl phosphorothioate
P043	55-91-4	Diisopropylfluorophosphate (DFP)
P004	309-00-2	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa-chloro-1,4,4a,5,8,8a, -hexahydro-(1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-

P060	465-73-6	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa-chloro-1,4,4a,5,8,8a- hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-
P037	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b] oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-(1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)-
P051	72-20-8	2,7:3,6-Dimethanonaphth [2,3, -bb] oxirene,3,4,5,6,9,9-hexachloro- 1a,2,2a,3,6,6a,7,7a-octahydro-(1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta,7aal pha)-, & metabolites
P044	60-51-5	Dimethoate
P046	122-09-8	alpha,alpha-Dimethylphenethylamine
P191	644-64-4	Dimetilan
P047	534-52-1	4,6, Dinitro-o-cresol, & salts
P048	51-28-5	2,4, -Dinitrophenol
P020	88-85-7	Dinoseb
P085	152-16-9	Diphosphoramide, octamethyl-
P111	107-49-3	Diphosphoric acid, tetraethyl ester
P039	298-0404	Disulfoton
P049	541-53-7	Dithiobiuret
P185	26419-73-8	1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, O-[(methylamino)-carbonyl] oxime
P050	115-29-7	Endosulfan
P088	145-73-3	Endothall
P051	72-20-8	Endrin, & metabolites
P042	51-43-4	Epinephrine
P031	460-19-5	Ethanedinitrile
P194	23135-22-0	Ethanimidothioc acid, 2-(dimethylamino)-N-{[(methylamino) carbonyl] oxy}-2-oxo-, methyl ester
P066	16752-77-5	Ethanimidothioic acid, N-{[(methylamino) carbonyl] oxy}-, methyl ester
P101	107-12-0	Ethyl cyanide
P054	151-56-4	Ethyleneimine
P097	52-85-7	Famphur
P056	7782-41-4	Fluorine
P057	640-19-7	Fluoroacetamide
P058	62-74-8	Fluoroacetic acid, sodium salt
P198	23422-53-9	Formetanate hydrochloride
P197	17702-57-7	Formparanate
P065	628-86-4	Fulminic acid, mercuric salt
P059	76-44-8	Heptachlor
P062	757-58-4	Hexaethyl tetraphosphate
P116	79-19-6	Hydrazinecarbothioamide
P068	60-34-4	Hydrazine, methyl-
P063	74-90-8	Hydrocyanic acid
P063	74-90-8	Hydrogen cyanide
P096	7803-51-2	Hydrogen phosphide
P060	465-73-6	Isodrin
P192	119-38-0	Isolan
P202	64-00-6	3-Isopropylphenyl N-methylcarbamate
P007	2763-96-4	3(2H)-Isoxazolone, 5-(aminomethyl)-
P196	15339-36-3	Manganese, bis(dimethylcarbamodithioato-S, S')-
P196	15339-36-3	Manganese dimethyldithiocarbamate

P092	62-38-4	Mercury, (acetato-O) phenyl-
P065	628-86-4	Mercury fulminate
P082	62-75-9	Methanamine, N-methyl-N-nitroso-
P064	624-83-9	Methane, isocyanato-
P016	542-88-1	Methane, oxybis(chloro-
P112	509-14-8	Methane, tetranitro-
P118	75-70-7	Methanethiol, trichloro-
P198	23422-53-9	Methanimidamide, N, N-diemthyl-N'-{3-[[(methylamino)-carbonyl] oxy]-phenyl}-, monohydrochloride
P197	17702-57-7	Methanimidamide, N,N-dimethyl-N'-{2-methyl-4-[[(methylamino) carbonyl]oxy]phenyl}-
P050	115-29-7	6,9, -Methano-2,4,3-benzodioxathiepin,6,7,8,9,10,10 hexachloro- 1,5,5a,6,9,9ahexahydro-,3-oxide
P059	76-44-8	4,7, -Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P199	2032-65-7	Methiocarb
P066	16752-77-5	Methomyl
P068	60-34-4	Methyl hydrazine
P064	624-83-9	Methyl isocyanate
P069	75-86-5	2-Methyllactonitrile
P071	298-00-0	Methyl parathion
P190	1129-41-5	Metolcarb
P128	315-08-4	Mexacarbate
P072	86-88-4	alpha-Naphthylthiourea
P073	13463-39-3	Nickel carbonyl (NiCO)
P074	557-19-7	Nickel cyanide (NiCN)
P075	54-11-5	Nicotine & salts
P076	10102-43-9	Nitric oxide
P077	100-01-6	p-Nitroaniline
P078	10102-44-0	Nitrogen dioxide
P076	10102-43-9	Nitrogen oxide (NO)
P078	10102-44-0	Nitrogen oxide (NO2)
P081	55-63-0	Nitroglycerine
P082	62-75-9	N-Nitrosodimethylamine
P084	4549-40-0	N-Nitrosomethylvinylamine
P085	152-16-9	Octamethylpyrophosphoramide
P087	20816-12-0	Osmium Tetroxide (OsO4)
P088	145-73-3	7-Oxabicyclo (2.2.1) heptane-2,3-dicarboxylic acid
P194	23135-22-0	Oxamyl
P089	56-38-2	Parathion
P034	131-89-5	Phenol, 2-cyclohexyl-4,6-dinitro-
P048	51-28-5	Phenol, 2,4-dinitro
P047	534-52-1	Phenol, 2-methyl-4,6-dinitro- & salts
P020	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
P009	131-74-8	Phenol, 2,4,6-trinitro-, ammonium salt
P128	315-18-4	Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester)
P199	2032-65-7	Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate
P202	64-00-6	Phenol, 3-(1-methylethyl)-, methylcarbamate
P201	2631-37-0	Phenol, 3-methyl-5-(1-methylethyl)-, methylcarbamate
P092	62-38-4	Phenylmercury acetate
P093	103-85-5	Phenylthiourea
P094	298-02-2	Phorate
P095	75-44-5	Phosgene

P096	7803-51-2	Phosphine
P041	311-45-5	Phosphoric acid, diethyl 4-nitrophenyl ester
P039	298-04-4	Phosphorodithioic acid, O, O-diethyl S-[2-(ethylthio)ethyl] ester
P094	298-02-2	Phosphorodithioic acid, O, O-diethyl S-[(ethylthio)methyl] ester
P044	60-51-5	Phosphorodithioic acid, O, O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
P043	55-91-4	Phosphorofluoridic acid, bis(1-methylethyl) ester
P089	56-38-2	Phosphorothioic acid, O, O-diethyl O-(4-nitrophenyl) ester
P040	297-97-2	Phosphorothioic acid, O, O-diethyl O-pyrazinyl ester
P097	52-85-7	Phosphorothioic acid, O-{4-[(dimethylamino)sulfonyl] phenyl} O, O-dimethyl ester
P071	298-00-0	Phosphorothioic acid, O, O-dimethyl O-(4-nitrophenyl) ester
P204	57-47-6	Physostigmine
P188	57-64-7	Physostigmine salicylate
P110	78-00-2	Plumbane, tetraethyl-
P098	151-50-8	Potassium cyanide (KCN)
P099	506-61-6	Potassium silver cyanide
P201	2631-37-0	Promecarb
P070	116-06-3	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl] oxime
P203	1646-88-4	Propanal, 2-methyl-2-(methyl-sulfonyl)-, O-[(methylamino) carbonyl] oxime
P101	107-12-0	Propanenitrile
P027	542-76-7	Propanenitrile, 3-chloro-
P069	75-86-5	Propanenitrile, 2-hydroxy-2-methyl-
P081	55-63-0	1,2,3,-Propanetriol, trinitrate
P017	598-31-2	2-Propanone, 1-bromo-
P102	107-19-7	Propargyl alcohol
P003	107-02-8	2-Propenal
P005	107-18-6	2-Propen-1-ol
P067	75-55-8	1,2-Propylenimine
P102	107-19-7	2-Propyn-1-ol
P008	504-24-5	4-Pyridinamine
P075	54-11-5	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts
P204	57-47-6	Pyrrolo[2,3-b] indol-5-ol, 1,2,3,3a,8,8ahexahydro-1,3a,8-trimethyl-, methylcarbamate (ester, (3aS-cis)-
P114	12039-52-0	Selenious acid, dithallium (thallous) salt
P103	630-10-4	Selenourea
P104	506-64-9	Silver cyanide (AgCN)
P105	26628-22-8	Sodium azide
P106	143-33-9	Sodium cyanide (NaCN)
P108	57-24-9	Strychnidin-10-one, & salts
P018	357-57-3	Strychnidin-10-one, 2,3-dimethoxy-
P108	57-24-5	Strychnine & salts
P115	7446-18-6	Sulfuric acid, dithallium (thallous) salt
P109	3689-24-5	Tetraethyldithiopyrophosphate
P110	78-00-2	Tetraethyl lead
P111	107-49-3	Tetraethyl pyrophosphate
P112	509-14-8	Tetranitromethane
P062	757-58-4	Tetraphosphoric acid, hexaethyl ester
P113	1314-32-5	Thallic oxide
P113	1314-32-5	Thallium oxide (Tl2O3)
P114	12039-52-0	Thallium (I) selenite (thallous selenite)
P115	7446-18-6	Thallium (I) sulfate (thallous sulfate)

P109	3689-24-5	Thiodiphosphoric acid, tetraethyl ester
P045	39196-18-4	Thiofanox
P049	541-53-7	Thioimidodicarbonic diamide (H2NCS)2NH
P014	108-98-5	Thiophenol
P116	79-19-6	Thiosemicarbazide
P026	5344-82-1	Thiourea, (2-chlorophenyl)-
P072	86-88-4	Thiourea, 1-naphthalenyl-
P093	103-85-5	Thiourea, phenyl-
P185	26419-73-8	Tirpate
P123	8001-35-2	Toxaphene
P118	75-70-7	Trichloromethanethiol
P119	7803-55-6	Vanadic acid, ammonium salt
P120	1314-62-1	Vanadium Oxide (V2O5) vanadium pentoxide
P084	4549-40-0	Vinylamine, N-methyl-N-nitroso-
P001	81-81-2	Warfarin, & salts, when present at concentrations greater than 0.3%
P205	137-30-4	Zinc, bis(dimethylcarbamodithioato-S,S')-,
P121	557-21-1	Zinc cyanide [Zn (CN)2]
P122	1314-84-7	Zinc phosphide (Zn3P2) when in concentrations greater than 10%
P205	137-30-4	Ziram

Excess Hazardous Material and Hazardous Waste Turn-In Form

Date:

Lab/Principal Investigator & Department:

Waste Location (room and location within room):

Your Name:

Generator Certification: I certify that the information provided is complete and accurately describes, to the best of my knowledge, the material to be turned in. By typing in my name I agree that it is equivalent to my handwritten signature.

******Please read the instructions worksheet******

	Item	Quantity	Units (gallons, pounds, etc.)	Physical State	Container Capacity or Dimensions	Comments	Hazards and/or pH
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

Waste Turn-in Form INSTRUCTIONS

Type in the date, the lab/department and principal investigator's name, the location of the waste (room and location within the room), and your name. By typing in your name, you are certifying that the information is correct to the best of your knowledge.

Column A:

List each bottle or container individually; i.e. do not group 3 bottles of ethanol waste into one entry in one line. Use additional sheets if necessary.

Column B: Item (chemical name(s))

1. Write out the full chemical name; do not use abbreviations
2. For kits, include manufacturer, trade name, and all individual components.
3. An MSDS must be available upon request; for kits, please send an MSDS with the disposal request.
4. Include percentages of all components of a mixture, be sure it totals to 100.

Column C: Quantity

Provide the quantity of the waste or excess material contained within each container.

Column D: Units

Provide the units of measure.

Column E: Physical State

S=Solid, L=Liquid, M=Mix of Solid and Liquid, G=Gas

Column F: Container Capacity

This value may be different from the quantity value and it's important that we know if, for example, you have 500 mL of Ethanol Waste in a 1L bottle.

Column H: Hazards/pH

Flammable, Toxic, Carcinogen, Corrosive/pH, Reproductive Hazard, etc.

Provide the pH is the waste is liquid and the pH is less than 5.5 or greater than 9.5.

Email the form to jabsom-ehso@lists.hawaii.edu

Email jabsom-ehso@lists.hawaii.edu if you have any questions.

Kaka'ako EHSO Waste Disposal Guidelines and Hazardous Materials Management Program can be found at: https://ehso.jabsom.hawaii.edu/waste/

JABSOM/UH Kaka'ako Hazardous Waste Generator Training must be current.

SAMPLE: Excess Hazardous Material and Hazardous Waste Turn-In Form

Date: *January 2, 2013*

Lab/Principal Investigator & Department: *TRMD/Nerurkar*

Waste Location (room and location within room): *Lab 324 in satelite accumulation cabinet*

Your Name: *Kimo Smith*

Generator Certification: I certify that the information provided is complete and accurately describes, to the best of my knowledge, the material to be turned in. By typing in my name I agree that it is equivalent to my handwritten signature.

******SAMPLE COMPLETED TURN-IN FORM******

	Item	Quantity	Units (gallons, pounds, etc.)	Physical State	Container Capacity or Dimensions	Comments	Hazards and/or pH
1	70% Ethanol Waste	1	gallon	L	1 gallon		flammable
2	70% Ethanol Waste	1	gallon	L	1 gallon		flammable
3	Xylene Waste	500	mL	L	1 Liter		flammable
4	Ethidium Bromide Gel Waste	~10	pounds	S	5 gallon bucket	Bag in EtBr waste container	mutagen
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

Conversion Calculator	
Liters	Gallons
1.00	0.26
Grams	Pounds
500.00	1.10

</= 40 ml are reported as 0.01 gallons

< 5 grams reported as 0.01 pounds

0.5 pints (8 oz.) = 0.06 gallon
1.0 quart (32 oz.) = 0.25 gallon
1.0 pint (16 oz.) = 0.13 gallon

Enter your amount in the liters or grams section to convert to gallons or pounds