Hazardous Waste Program Manual

Environmental Health, Safety and Risk Management Department
Box 6113, SFA Station
Nacogdoches, Texas 75962-6113

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Contents

I. Introduction

Environmental awareness and protection of our natural resources has become a national priority. As a nation, we have come to recognize that hazardous agents of all types have entered our environment through improper use and disposal. In response to the national concern for proper management of waste materials, Congress passed the Resource Conservation and Recovery Act (RCRA) in 1976. Under this act, the Environmental Protection Agency (EPA) was given the responsibility for regulating hazardous chemical wastes. In Texas, the Texas Commission on Environmental Quality (TCEQ) controls hazardous chemical wastes, while the Texas Department of State Health Services (TDSHS) regulates radioactive and biological wastes.

Stephen F. Austin State University (SFA) produces a small amount of hazardous waste in performing its functions of service, teaching, and research. Since the university generates less than 220 pounds of hazardous chemical waste per month, it is classified by the EPA as a "Conditionally Exempt Small Quantity Generator". As a result, the university is subject to regulations specific to proper handling, storage, and disposal of various types of hazardous waste.

The Environmental Health, Safety, and Risk Management Department (EHSRM) is charged with the responsibility of ensuring that hazardous waste generated on SFA's campus is managed and disposed of in accordance with all applicable city, state, and federal regulations. The function of the ESHRM Department is to assist faculty, staff, and students with their responsibility of managing all wastes properly and cost-effectively. The EHSRM Department also coordinates all hazardous waste efforts for the university, which includes enforcing proper storage, labeling, record keeping, and disposal requirements, as well as purchasing controls of hazardous substances and meeting training requirements.

II. Purpose

The purpose of this manual is to explain the requirements of the SFA Hazardous Waste Program and describes the proper procedures for preparing hazardous waste for storage, and disposal, as regulated under the law. Responsibilities of every individual involved in the hazardous waste generation, storage, and disposal process are described in this manual. Please contact the EHSRM Department for additional information and help regarding your hazardous waste (468-6034). The cooperation of every member of the SFA community is essential in ensuring safety and compliance regarding hazardous waste.

III. Responsibilities

A. Deans, Chairs, Directors, and Supervisors Responsibilities

1. Ensure that personnel who generate hazardous wastes have received training in the use of the SFA Hazardous Waste Program and are complying with federal and state regulations related to hazardous and universal waste.
    - Training is typically provided by the individual colleges/departments, but specialized training sessions will be provided by the EHSRM Department upon request.
2. Provide all necessary materials and equipment (containers, spill kits, personal protective equipment, etc.) needed for the proper handling of their hazardous waste.
3. Provide funding for disposal fees for the waste generated within their department.
    - The EHSRM Department is not funded to pay for disposal of waste; however, all hazardous waste disposal must be coordinated by the EHSRM Department.

B. Faculty and Staff Responsibilities

1. Receive the proper training in hazardous waste management appropriate for the level of hazard of the materials being handled in the laboratory or work area (chemical, biological, radioactive).
2. Identify waste streams generated in the laboratory or work area and determine if the waste is hazardous or otherwise controlled (see section V: Waste Identification on page 7 for more information).
3. Discuss new processes or chemical use on campus that are expected to create large quantities of hazardous waste with the EHSRM Department prior to initiating the new process or chemical use.
4. Properly label all hazardous waste containers and notify EHSRM when containers are ready for disposal (See section VI: Waste Handling, Labeling, and Storage Requirements on page 17 for more detailed information).
5. Adhere to all requirements contained in this manual as well as any other applicable SFA safety manuals (Laboratory Safety Manual, Biosafety Manual, Radiation Safety Manual, and Pesticide Safety Manual).

C. Environmental Health, Safety, and Risk Management Responsibilities

1. Ensure compliance with applicable city, state, and federal regulations related to the proper management and disposal of hazardous waste.
2. Advise SFA faculty and staff of current and relevant regulatory requirements and information related to proper waste management and disposal.
3. Maintain a current contract with a licensed and reputable hazardous waste disposal contractor.

4. Coordinate all hazardous waste disposal efforts with the contracted hazardous waste disposal company.
5. Provide training as needed to university faculty, staff, and students related to the proper management and disposal of hazardous waste.
6. Periodically inspect hazardous waste generation and storage areas to ensure compliance with container, labeling, and storage requirements.

COMPLIANCE CAUTION

FEDERAL AND TEXAS LAW STIPULATES THAT EACH INDIVIDUAL WHO GENERATES HAZARDOUS WASTE IS PERSONALLY LIABLE AND IS RESPONSIBLE FOR ASSURING COMPLIANCE WITH REGULATIONS AND PROPER HAZARDOUS WASTE MANAGEMENT.

AT NO TIME SHOULD ANY HAZARDOUS WASTE BE DISPOSED OF DOWN SINK, FLOOR OR STORM DRAIN, EVAPORATED OUTSIDE OR IN A FUME HOOD, OR DISPOSED OF IN THE REGULAR TRASH.

IV. Training Requirements

A. General Hazardous Waste Training

All individuals who generate hazardous chemical, biological, or radioactive waste must receive documented training, according to SFA's Hazardous Waste Program Manual, the EPA's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Texas Commission on Environmental Quality (TCEQ). It is the responsibility of each department supervisor to make sure their employees complete the training prior to conducting work that generates a hazardous waste. The EHSRM Department can provide the training to satisfy this requirement upon request.

The General Hazardous Waste training will cover all guidelines and procedures discussed in this manual. In addition to the General Hazardous Waste training, the supervisor must provide information specific to the employee's particular work area.

B. Refresher Training

General Hazardous Waste Refresher training is also required for all individuals generating or handling hazardous waste every 5 years. As mentioned above, each supervisor is responsible for ensuring all training requirements are met. EHSRM can assist in meeting this requirement upon request. All training must be documented as described below.

C. Training Records

Hazardous Waste Training should be documented on the Hazardous Waste Training Roster (available in *Appendix A* on page 27), and forwarded to the EHSRM Department upon completion. To meet regulatory requirements and as a service to departments, faculty, and staff, the EHSRM Department keeps training records on all individuals. Supervisors should also keep a copy of the training records to ensure employees are up to date on the training requirements.

Copies of the training records must be submitted to the EHSRM department via campus mail box 6113, faxed to 468-7312, or emailed to safety@sfasu.edu. Call EHSRM at 468-6034, for assistance with training records or to schedule an initial or refresher training class.

V. Waste Identification

The first step in the management of hazardous waste is to determine whether a material is a waste. A waste is generally defined as a material, which is discarded, including materials that are either spent or intended to be thrown away. Materials that are being used for their intended purpose or are otherwise still reusable are not considered waste. A waste can be a solid, liquid, semisolid, or contained gas material.

The second step in the waste identification process is to determine if the waste is a hazardous waste. Waste generators are required to complete a *Waste Stream Determination Form* (located in *Appendix B* on page 28) for all wastes generated, even if the waste is not considered hazardous. The *Waste Stream Determination Form* is also located on the EHSRM website at: http://www.sfasu.edu/safety/documents/Hazardous_Waste_Determinations_and_Documentation_Guidance_and_Form(1).pdf.

Completed copies of the *Waste Stream Determination Forms* should be forwarded to the EHSRM Department via campus mail SFA Box 6113, faxed to 468-7312, or emailed to safety@sfasu.edu.

A. Hazardous Chemical Wastes

The following information will help you determine if a waste is hazardous based on its characteristics and/or chemical makeup.

A hazardous chemical waste is defined by the EPA as a waste which, due to its quantity, concentration, or physical and chemical characteristics may:

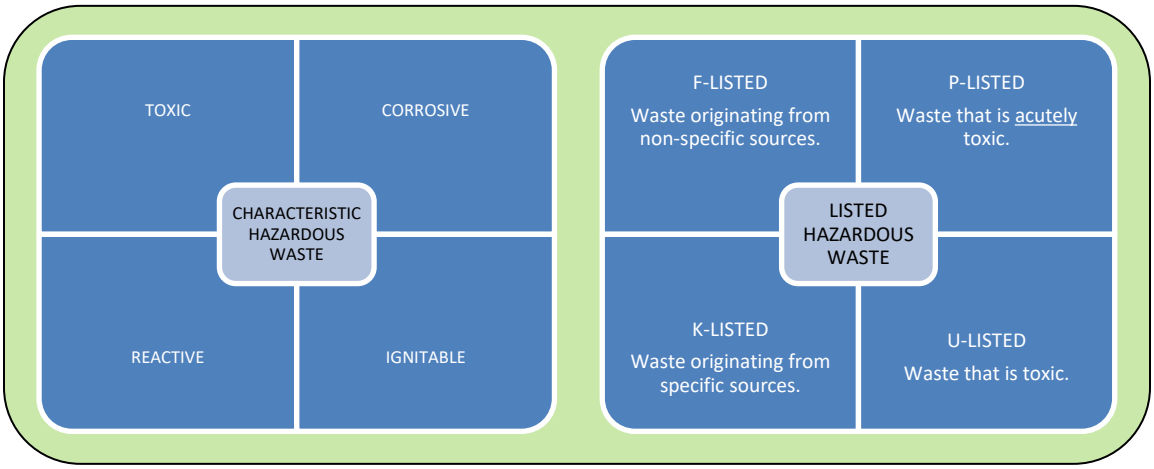
- Cause, or significantly contribute to, an increase in mortality or an increase in serious illness; or

- Pose a substantial present or potential threat to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

The purpose of this section is to help you better understand exactly what is and is not a regulated hazardous chemical waste. In doing so, we hope that you may be able to design experiments with waste minimization in mind, and dispose of chemical waste generated in your laboratory in a manner consistent with legal requirements. The U.S. Environmental Protection Agency and the Texas Commission on Environmental Quality (TCEQ) regulate the treatment and disposal of chemical wastes in Texas.

According to federal and state regulations, each generator of chemical waste must first conduct a hazardous waste determination by using one of the methods described in the following sections (Characteristic Hazardous Waste, Listed Hazardous Waste, Class I Wastes, Universal Waste, Biological Waste, or Radioactive Waste). If assistance is needed to determine the hazardous nature of a waste, contact the EHSRM Department at 468-6034. Forward copies to EHSRM at SFA PO Box 6113, or Fax to 468-7312.

The Hazardous Waste Universe



B. Characteristic Hazardous Waste

The first method of determining if your waste is hazardous is by determining if it exhibits one of the following four characteristics described in detail below.

In the code of Federal Regulations (40 CFR 261.20 – 261.24), the Resource Conservation and Recovery Act (RCRA) defines the four fundamental characteristics of regulated waste as:

1. **Ignitable:**

a) Any liquid waste or liquid waste mixture having a flashpoint of 140º F (60º C) or lower. Examples include most spent non-halogenated solvents such as methanol, ethanol, acetone, xylene, toluene, benzene, and gasoline.
b) Any solid waste that is capable of causing fire through friction or absorption of moisture or can undergo spontaneous chemical change resulting in persistent burning. Solids such as sodium or potassium metals, solid naphthalene, and nitrocellulose also fall into this category.
c) Flammable compressed gases, including those that form flammable mixtures with air.
d) Oxidizers that stimulate combustion of organic materials.
e) Ignitable wastes should always be isolated from ignition sources.
f) Ignitable materials include most common organic solvents, gases such as hydrogen and hydrocarbons, and certain nitrate salts.

2. **Toxic:**

a) Any waste which contains concentrations of certain constituents in excess of regulatory limits is a toxic hazardous waste.
b) According to EPA, the 40 constituents that must be considered when evaluating a waste for potential toxic concentrations include six pesticides, eight heavy metals, and 26 solvents and other organics.

Pesticides	Metals	Organics	
Endrin	Arsenic	Chloroform	Methyl ethyl ketone
Lindane	Barium	o-Cresol	Nitrobenzene

Methoxychlor	Cadmium	m-Cresol	Pentachlorophenol
Toxaphene	Chromium	p-Cresol	Pyridine
2,4-D	Lead	Cresol (total)	Tetrachloroethylene
2,4,5 TP Silvex	Mercury	1,4-Dichlorobenzene	Benzene
	Selenium	1,2-Dichloroethane	Trichloroethylene
	Silver	1,1-Dichloroethylene	Carbon Tetrachloride
		2,4-Dinitrotoluene	2,4,5-Trichlorophenol
		Heptachlor	Chlordane
		Hexachlrobenzene	2,4,6-Trichlorophenol
		Hexachlorobutadiene	Chlorobenzene
		Hezachloroethane	Vinyl Chloride

c) The levels at which these chemicals are regulated in mixtures varies from 0.2 ppm to 400 ppm. For example, solutions that contain mercury at levels above 0.2 ppm are hazardous waste. These levels are very low, so if a waste contains one or more of these components it should be considered a hazardous waste.

Note: Eight metals and other constituents listed here are regulated in both their pure forms and as compounds.

3. Corrosive:

a) Any waste liquids or waste liquid mixture having a pH less than or equal to 2 or greater than or equal to 12.5. Examples include hydrochloric acid, phosphoric acid, sulfuric acid, sodium hydroxide, and corrosive cleaning agents.
b) Liquid substances which corrode steel at a rate greater than 6.35 millimeters (0.250 inches) per year at a test temperature of 55ºC (130º C).
c) *Dilution of acids or bases with water is not an acceptable practice. Acids and bases can be neutralized as part of an experiment, but that process must be a written step in the experimental procedure.*
d) In addition, liquids or liquid mixtures having a pH less than 5.5 or greater than 11.5 are not permitted to be disposed of via sink drains or other wastewater conveyances. Disposal of such liquids is specifically prohibited by the University's municipal wastewater discharge permit.

4. Reactive:

a) Unstable materials capable of undergoing violent chemical change (without detonating).
b) Materials which react violently with water.
c) Materials which form potentially explosive mixtures with water.
d) Materials which, when mixed with water, generate toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment.
e) Cyanide or sulfide bearing wastes which, when exposed to pH conditions between 2 and 12.5, will generate toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment.
f) Materials capable of detonation or explosive reaction when subjected to a strong initiating source or if heated in confinement.
g) Materials which are capable of detonation or explosive decomposition at standard temperature and pressure.

C. Listed Hazardous Waste

Another method of determining if a waste is hazardous, is if one of more of the chemicals that make up the waste are identified on one of the categorized lists developed by the EPA.

The EPA has developed four lists of hazardous chemical waste described in the Resource Conservation and Recovery Act (40 CFR Part 261, Subpart D). The four lists of hazardous waste include the following which in total includes over 800 different substances.

F-Listed	P-Listed	U-Listed	K-Listed
• Waste originating from non-specific sources.	• Waste that is acutely toxic.	• Waste that is toxic.	• Waste originating from specific sources.

The wastes regulated as listed chemical wastes are specifically listed in 40 CFR sections 261.31 (F list), 261.32 (K list), 261.33 (P and U lists). Refer to *Appendix C* on page 30 and *Appendix D* on page 36 for detailed lists of these wastes.

1. F-Listed Waste

The **F List** addresses wastes from nonspecific sources (e.g., spent solvents) and is broken down into several subcategories (or *codes*). Five codes that are commonly applicable to laboratory wastes are:

F001 Code — Applicable to all spent solvent mixtures and blends used for degreasing which contained, before use, a total of ten percent or more (by volume) of one or more of the following halogenated solvents:

tetrachloroethylene	trichloroethylene
methylene chloride	1,1,1-trichloroethane
carbon tetrachloride	chlorinated fluorocarbons

F002 Code — Applicable to all spent solvent mixtures and blends which contained, before use, a total of ten percent or more (by volume) of one or more of the following halogenated solvents:

tetrachloroethylene	methylene chloride
trichloroethylene	1,1,1-trichloroethane
chlorobenzene	1,1,2-trichloro-1,2,2-trifluoroethane
ortho-dichlorobenzene	trichlorofluoromethane
1,1,2-trichloroethane	

F003 Code — Applicable to all spent solvent mixtures and blends which contained, before use, a total of ten percent or more (by volume) of one or more of the following non-halogenated solvents:

xylene	acetone
ethyl acetate	ethyl benzene
ethyl ether	methyl isobutyl ketone
n-butyl alcohol	cyclohexanone
methanol	

F004 Code — Applicable to all spent solvent mixtures and blends which contained, before use, a total of ten percent or more (by volume) of one or more of the following non-halogenated solvents:

cresols and cresylic acid	nitrobenzene

F005 Code — Applicable to all spent solvent mixtures and blends which contained, before use, a total of ten percent or more (by volume) of one or more of the following non-halogenated solvents:

toluene	methyl ethyl ketone
carbon disulfide	isobutanol
pyridine	benzene
2-ethoxyethanol	2-nitropropane

2. K-Listed Waste

The **K List** addresses waste from specific sources (e.g., pink/red water from TNT operations - K047) and is generally not applicable to wastes generated in teaching and research laboratories.

3. P-Listed Waste

The **P List** addresses unused *acutely hazardous materials* (e.g., laboratory chemicals having an LD_{50} of less than 50 mg/kg (oral; rat)). It is applicable to many surplus chemicals that are disposed of by research laboratories. Some examples are nickel tetracarbonyl, phosphine, and osmium tetroxide. This list can be found in *Appendix C* on page 30.

4. U-Listed Waste

The **U List** addresses unused hazardous materials (e.g., toxic laboratory chemicals). Like the P list, this is applicable to many surplus chemicals that are disposed of by research laboratories. Some examples are aniline, benzene, and acetone. The U list can be found in *Appendix D* on page 36.

D. Class I Wastes

Waste generators should also be aware of Class I wastes. Wastes in this category are regulated by the TCEQ, are not considered hazardous by the EPA definition, but must be disposed of at a permitted landfill due to Texas regulations. Examples of wastes which fall under the Class I definition are soils contaminated with petroleum hydrocarbons, sandblasting sand with leachable lead concentrations between 1.5 and 5.0 ppm, used oil,

and solids that when mixed with an equal weight of liquid form a corrosive solution. Class I wastes should also be managed and disposed of through the SFA Hazardous waste program to ensure proper disposal at a permitted landfill.

The following are the guidelines for categorizing Class I wastes:

1. Regulated asbestos containing material.
2. Materials containing specific toxic chemical constituents, which exceed regulated concentration levels, although not enough to be considered hazardous.
3. Liquids, which are ignitable at levels above 150 degrees F, or are solids and semi-solids and contain chemicals considered to be ignitable under certain conditions incidental to storage, disposal, or treatment.
4. Semi-solids and solids which when combined with water exhibit corrosive properties.
5. Empty containers, which held hazardous substances or a Class 1 waste, unless the residue has been completely removed by triple rinsing the container.
6. Waste containing more than 50 parts-per-million of total polychlorinated biphenyls (PCBs).
7. Waste associated with exploration, development and production of crude oil, natural gas or geothermal energy, which contain more than 1,500 parts per million total petroleum hydrocarbons (TPH).
8. All non-hazardous industrial solid waste generated outside Texas and transported into or through Texas for storage, processing or disposal.

E. Universal Waste

Federal and State agencies also regulate other wastes the University generates under less stringent guidelines set up to encourage recycling and reduce illegal disposal. The wastes falling under this category are noted as *Universal Wastes* and include batteries, spent fluorescent lamps (light bulbs), pesticides, and certain mercury-containing equipment. If you have questions concerning the proper handling, storage, and management of any of these wastes contact EHSRM at 468-6034.

Note: Universal Waste is still a hazardous waste with specific storage and disposal guidelines. Universal Waste is not allowed in the regular trash.

1. Batteries

All spent batteries containing lead, nickel, lithium, cadmium, or any other hazardous component are classified as Universal Wastes and must be recycled no matter what size. Standard Alkaline batteries are not regulated and may be disposed of in the regular trash.

2. Fluorescent Lamps

All spent fluorescent lamps, except those with green end caps; contain mercury in such amounts that they exhibit a hazardous waste toxicity characteristic. State and federal regulations allow them to be managed as a Universal Waste and must be recycled. However, if the lamps are broken during removal they must labeled and managed as hazardous waste. In the event of a broken bulb, contact the Physical Plant or EHSRM. In addition, spent light ballasts also require special consideration because they may contain PCBs. Leaking ballast must be kept separate and placed in a leak proof container immediately. In the event of ballast malfunction or a leaking ballast, contact the Physical Plant.

3. Pesticides

Waste pesticides can also qualify as Universal Wastes if they have been recalled or come from stocks of unused products gathered as part of a waste pesticide collection program.

4. Mercury-Containing Equipment

This category includes devices, items, or articles that contain varying amounts of elemental mercury integral to its function. Some commonly recognized devices are thermostats, barometers, manometers, temperature and pressure gauges, and mercury switches such as light switches in automobiles.

5. Paint and Paint Related Waste

Under the Texas rule, the following paint and paint related waste may be managed as Universal Waste:

a) Used or unused paint and paint-related material which is technically "hazardous waste" (oil based paints), and
b) Any mixture of pigment and a suitable liquid that forms a closely adherent coating when spread on a surface or any material that results from painting activities.

F. Biological Waste

The Texas Department of State Health Services (TDSHS) has identified biological waste as waste that requires special handling to protect human health or the environment. Specific regulatory requirements apply to the proper handling and disposal of biological waste to prevent the potential spread of infectious diseases. Biological waste is regulated by the TCEQ and the TDSHS. For more information on proper handling and disposal of biological waste, see the SFA Biological Safety Manual located on the EHSRM website at: http://www.sfasu.edu/safety/.

Biological waste is comprised of the following:

1. **Microbiological Waste**

Microbiological waste includes:
a) Discarded cultures and stocks of infectious agents and associated biologicals.
b) Discarded cultures of specimens from medical, pathological, pharmaceutical, research, clinical, commercial, and industrial laboratories.
c) Discarded live and attenuated vaccines, but excluding the empty containers thereof.
d) Discarded, used disposable culture dishes.
e) Discarded, used disposable devices used to transfer, inoculate, or mix cultures.

Note: In vitro tissue cultures that have not been intentionally exposed to pathogens are exempt from these regulations.

2. **Animal Waste**

Animal waste includes:
a) Carcasses of animals.
b) Body parts of animals.
c) Whole blood, serum, plasma, and/or other blood components from animals.
d) Bedding of animals intentionally exposed to pathogens.

3. **Human Blood and Blood Products**

Human blood and blood products include:
a) Human blood, serum, plasma, other blood components, and body fluids.
b) Disposable items contaminated with human blood or body fluids.

4. **Pathological Waste**

Pathological waste includes but is not limited to:
a) Human materials removed during surgery, labor and delivery, autopsy, embalming, or biopsy, including: body parts and tissues or fetuses.
b) Laboratory specimens of blood and tissue after completion of laboratory examination.
c) Anatomical remains.

5. **Sharps**

Sharps include but are not limited to the following, **regardless of contamination**:
a) Hypodermic needles.
b) Hypodermic syringes with attached needles.
c) Scalpel blades.

d) Razor blades, disposable razors, and disposable scissors used in surgery or other medical procedures.
e) Glass Pasteur pipettes.

Sharps include but are not limited to the following, **when contaminated**:
a) Glass pipettes.
b) Broken glassware.
c) Specimen tubes;
d) Blood culture bottles.
e) Microscope slides.

Contaminated is defined as the presence or the reasonably anticipated presence of blood, body fluids, or other infectious materials.

G. Radioactive Waste

SFA currently does not have a license to use regulated radioactive materials. The following guidelines will be useful in the event that SFA obtains the proper license for the use of regulated radioactive materials on campus.

All radioactive waste generated by the use of radioactive materials at SFA shall be disposed of in such a way as to prevent the occurrence of a hazard to the health of university staff, students, faculty, and the general public. All users of radioactive materials must comply with the Texas Regulations for the Control of Radiation. Additional information on radioactive material waste management is covered in the SFA Radiation Safety Manual available on the EHSRM website at: http://www.sfasu.edu/safety.

VI. Waste Handling, Labeling, and Storage Requirements

If you determine, from the information in the previous section, that you do have a hazardous waste, the following handling, labeling, and storage requirements apply: Specific requirements for the proper handling and storage of hazardous waste are set forth by the EPA and TCEQ.

The following procedures will ensure compliance with the regulations related to proper labeling and storage of hazardous waste:

A. Waste Containers

Containers used to store waste should be in good condition free from leaks or cracks with securely closed lids. The containers must be compatible with the type of waste being stored to prevent deterioration and leaks.

If a waste container begins to leak, the generator must transfer the waste into a container that is in good condition or overpack the container into a larger container with an absorbent material.

Below are the waste container labeling and storage guidelines for all hazardous waste containers:

1. All hazardous waste containers must be clearly marked with the words "HAZARDOUS WASTE" with a detailed description of the contents. Remove or cover any old labels on the container. Hazardous waste labels are on file with the SFA Printing Services (phone: 468-1796) and are the preferred method of labeling waste containers. Contact Printing Services to order "Hazardous Waste" labels for your laboratory or work area.
2. Write a description of the contents on the label. A chemical mixture may be expressed as the actual volume (in mL) of each chemical in the mixture or as a percentage of each chemical making up the waste (totaling 100%). Also include any water or solvents that makeup the waste mixture.
3. Once the container is full or no longer being used to add waste, write in the accumulation start date. Containers still being used to add waste are considered "active waste containers" and should not be dated with an accumulation start date.
4. Waste containers should be kept at or near the source of waste generation (in the lab or work area) and controlled from unauthorized access.
5. Keep waste containers closed at all times except when waste is being added. Caps or lids on waste containers must close securely to prevent leakage if the container is tipped over.

Examples of Improper Container Capping

B. Waste Accumulation Areas

Waste Accumulation Areas are designated storage rooms or other restricted areas where hazardous and other regulated wastes are properly stored until they are picked up by EHSRM staff for final disposal by an approved hazardous waste disposal contractor. The following requirements for waste accumulation areas must be met:

1. Designated waste accumulation areas should be identified for each laboratory or work area on campus and access restricted to only those people who are authorized to collect and manage waste. The waste accumulation area may be in the lab/work area or in a nearby room designated as a waste storage area.
2. A generator may store up to 55 gallons of hazardous waste or one quart of acutely hazardous waste on-site (see *Appendix C* on page 30, EPA's "P" List of Acutely

Hazardous Chemicals). Notify EHSRM for pick-up at least one week prior to reaching these limits.

3. Segregate wastes and store compatible or similar wastes together.
4. Store waste in appropriate storage areas such as flammable or corrosive storage cabinets.
5. Hazardous waste should never be stored in or around drains or sinks.
6. The waste storage area should be kept clean and inspected for leaks or spills at least weekly. EHSRM staff inspects waste storage areas monthly, and will notify appropriate personnel of any violations or safety concerns.
7. Waste must never be left in a hallway or any other area where it could endanger personnel, facility safety, or the environment.
8. Do not mix incompatible wastes. Examples of incompatible chemicals are provided in the table below.

C. Examples of Incompatible Chemicals

Chemical	Incompatible with
acetic acid	chromic acid, nitric acid, perchloric acid, peroxides, permanganates
acetic anhydride	Hydroxyl-containing compounds such as ethylene glycol and perchloric acid
acetylene	chlorine, bromine, copper, fluorine, silver, mercury
acetone	concentrated nitric and sulfuric acid mixtures
alkali and alkaline earth metals	water, carbon tetrachloride or other chlorinated hydrocarbons, carbon dioxide, halogens
ammonia (anhydrous)	mercury, chlorine, calcium hypochlorite, iodine, bromine, hydrofluoric acid (anhydrous)
ammonium nitrate	acids, powdered metals, flammable liquids, chlorates, nitrates, sulfur, finely divided organic or combustible materials
aniline	nitric acid, hydrogen peroxide
arsenical materials	any reducing agent
azides	acids
bromine	see chlorine
calcium oxide	water
carbon (activated)	calcium hypochlorite, all oxidizing agents
carbon tetrachloride	sodium
chlorates	ammonium salts, acids, powdered metals, sulfur, finely divided organic or combustible materials
chromic acid and chromium trioxide	acetic acid, naphthalene, camphor, glycerol, alcohol, flammable liquids in general

chlorine	ammonia, acetylene, butadiene, butane, methane, propane or other petroleum gases, hydrogen, sodium carbide, benzene, finely divided metals, turpentine
chlorine dioxide	ammonia, methane, phosphine, hydrogen sulfide
copper	acetylene, hydrogen peroxide
cumene hydroperoxide	acids (organic and inorganic)
cyanides	acids
flammable liquids	ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
fluorine	everything
hydrazine	hydrogen peroxide, nitric acid, any other oxidant
hydrocarbons (e.g., propane, butane, benzene)	fluorine, chlorine, bromine, chromic acid, sodium peroxide
hydrocyanic acid	nitric acid, alkali
hydrofluoric acid (aqueous or anhydrous)	ammonia (aqueous or anhydrous)
hydrogen peroxide	copper, chromium, iron, most metals or their salts, alcohols, acetone, organic materials, aniline, nitromethane, combustible materials
hydrogen sulfide	fuming nitric acid, oxidizing gases
hypochlorites	acids, activated carbon
iodine	acetylene, ammonia (aqueous or anhydrous), hydrogen
mercury	acetylene, fulminic acid, ammonia
nitrates	sulfuric acid
nitric acid (concentrated)	acetic acid, aniline, chromic acid, hydrocyanic acid, hydrogen sulfide, flammable liquids, flammable gases, copper, brass, any heavy metals
nitrites	acids
nitroparaffins	inorganic bases, amines
oxalic acid	silver, mercury
oxygen	oils, grease, hydrogen, flammable liquids, solids, or gases
perchloric acid	acetic anhydride, bismuth and its alloys, alcohol, paper, wood, grease, oils
peroxides, organic	acids (organic or mineral), avoid friction, store cold
phosphorus (white)	air, oxygen, alkalis, reducing agents

phosphorus pentoxide	alcohols, strong bases, water
potassium	carbon tetrachloride, carbon dioxide, water
potassium chlorate	sulfuric and other acids
potassium perchlorate (also see chlorates)	sulfuric and other acids
potassium permanganate	glycerol, ethylene glycol, benzaldehyde, sulfuric acid
selenides	reducing agents
silver and silver salts	acetylene, oxalic acid, tartaric acid, ammonium compounds, fulminic acid
sodium	carbon tetrachloride, carbon dioxide, water
sodium nitrite	ammonium nitrate and other ammonium salts
sodium peroxide	ethanol and methanol, glacial acetic acid, acetic anhydride, benzaldehyde, carbon disulfide, glycerin, ethylene glycol, ethyl acetate, methyl acetate, furfural
sulfides	acids
sulfuric acid	potassium chlorate, potassium perchlorate, potassium permanganate (and similar compounds of light metals such as sodium, lithium)
tellurides	reducing agents

VII. Disposal Procedures for Regulated Hazardous Wastes

Each department at SFA is responsible for the costs associated with the disposal of their hazardous waste and should budget appropriately. All SFA departments should report any waste to the EHSRM Department for proper disposal. The EHSRM Department will assist all campus departments with the removal and disposal process of their hazardous waste and should always be contacted whenever hazardous waste is being generated and disposed of. Each department should follow the disposal guidelines outlined below.

A. Waste Tags and Request for Disposal

Before a hazardous waste can be picked up by EHSRM, a waste tag must be filled out and attached to the container. The information on the waste tag is useful in categorizing, tracking, and ensuring proper disposal of the waste. Please fill out the tag completely, accurately, and legibly. The SFA Hazardous Waste Tag is available in *Appendix E* on page 51, as well as on the EHSRM website at http://sfasu.edu/safety.
To fill in the Contents section of the waste tag, be specific with the full chemical name. Do not use formulas or abbreviations. Do not use vague names such as “organic waste” or “aqueous solvent waste”. This will only delay the disposal process until the actual chemical names are provided.

When your waste container is ready for disposal and properly tagged, contact EHSRM to request a pickup. Campus wide waste disposals are typically scheduled for early January of each year. Additional hazardous waste disposals may be scheduled at other times in the year as needed.

Additionally, consider the following alternatives to disposal:

1. Determine if you can reuse or recycle this waste in your laboratory. If so, there is no need to dispose of the material.
2. If you have unopened or uncontaminated containers in a usable form, you should attempt to find another user within your department. The EHSRM Department can assist you in this process.

B. Unknown Waste

If you have an unidentified chemical waste that you want to dispose of, attempt to identify the contents by asking other faculty and staff if they produced the material or know who did. If your efforts at identifying the waste are unsuccessful, the contents will have to be analyzed at a significant cost. Please notify EHSRM as soon as an unknown waste is discovered. You cannot move or dispose of any unknown substance from your lab. Each department is solely responsible to pay for any analyzing costs and disposal fees.

VIII. Disposal Procedures for Non Hazardous Waste

Not all laboratory wastes are hazardous and so should not be entered into the SFA hazardous waste program. Some examples of non-hazardous wastes are provided below as well as in an alphabetical list in *Appendix F* on page 52. The chemicals listed in *Appendix F* have been evaluated by EHSRM and determined to be non-hazardous wastes. Non-hazardous waste may include the following:

A. Non-Hazardous Chemical Related Waste

1. Non-hazardous liquid waste may be poured down sink drains after obtaining approval from EHSRM. Liquid waste (i.e., bottles of unused or partially used solutions) may never be disposed of in dumpsters, as liquid wastes are not permitted at the municipal landfill.
2. Empty containers of commercial products or chemicals may be placed in the regular trash if no freestanding liquids remain in the containers and all disposal requirements noted on the label are met. Empty containers must be defaced by removing container labels or marking through labels to indicate the containers no longer contain hazardous materials. See the “Empty Containers” section on page 24 for more information.

3. Animal wastes containing non-hazardous preservative (such as carasafe) should be placed in a bucket or thick trash bag, after all liquid has been drained, and taken directly to the outside dumpster. No animal remains should be placed in the laboratory trash cans. Animal specimens preserved in formaldehyde, formalin, or other hazardous chemical preservative must be handled as hazardous waste.
4. Non-hazardous liquid preservative waste such as Carasafe may be poured down the lab sink drain.
5. Certain solid, non-hazardous chemicals are suitable for disposal to the sanitary landfill. However, such chemicals should not be placed in laboratory trash cans as custodial personnel have been instructed not to handle any chemical or potentially hazardous wastes. Non-hazardous solids should be placed directly into the dumpsters.
6. The following types of solid laboratory wastes are generally considered non-hazardous or of low toxicity and so may be put directly in the dumpsters. As noted above, solutions of such wastes should not be put in the laboratory trash containers. Check with EHSRM Department for quantities greater than 5 pounds.

    a) Organic chemicals:
        - Sugars and starches
        - Naturally occurring a-amino acids and salts
        - Citric acid and its Na, K, Mg, Ca, NH4 salts
        - Lactic acid and its Na, K, Mg, Ca, NH4 salts+

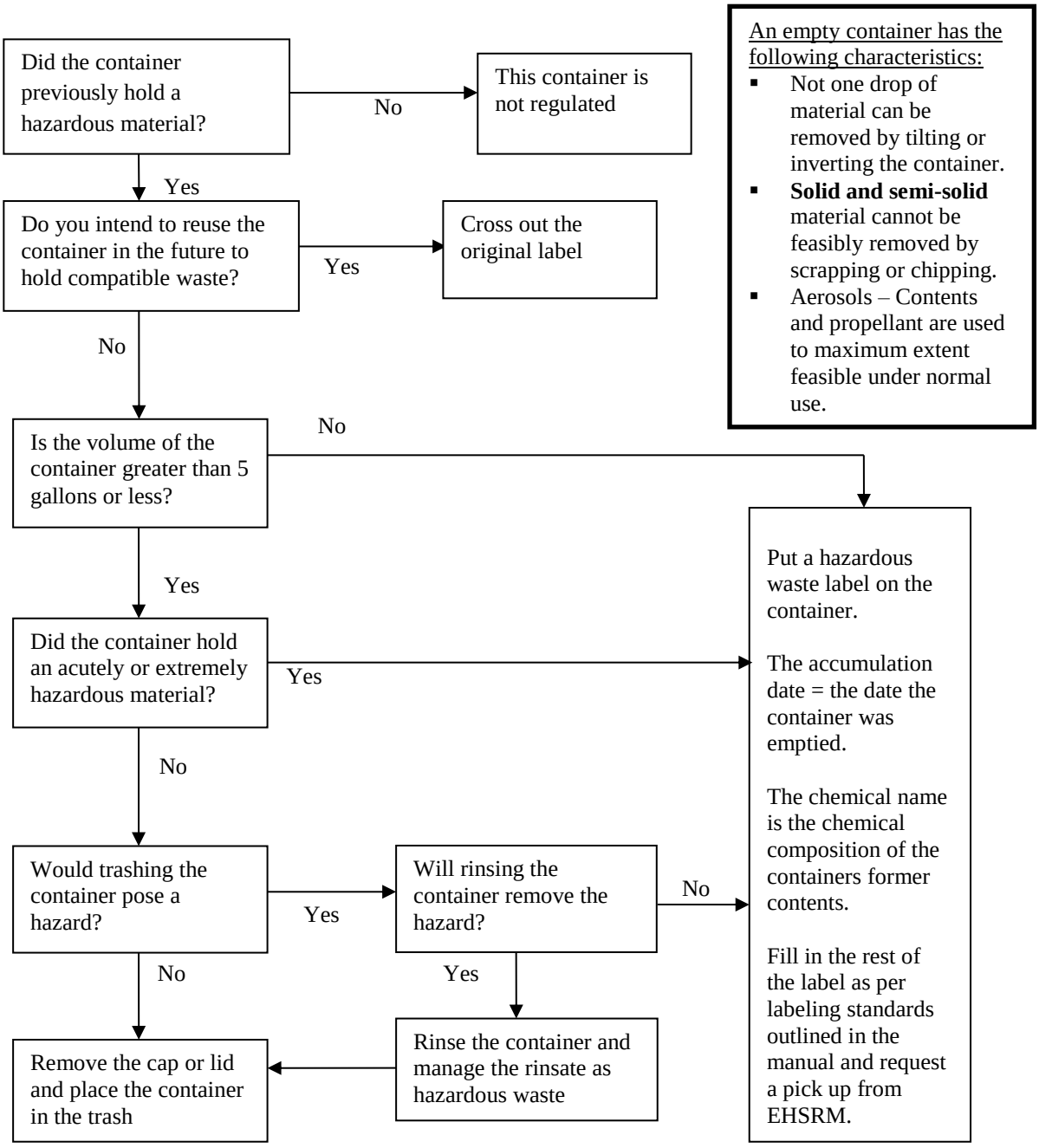
    b) Inorganic chemicals
        - Sulfates: Na, K, Mg, Ca, Sr, NH4
        - Phosphates: Na, K, Mg, Ca, Sr, NH4
        - Carbonates: Na, K, Mg, Ca, Sr, NH4
        - Oxides: B, Mg, Ca, Sr, Al, Si, Ti, Mn, Fe, Co, Cu, Zn
        - Chlorides: Na, K, Mg
        - Fluorides: Ca
        - Borates: Na, K, Mg, Ca

    c) Laboratory materials not contaminated with hazardous chemicals:
        - Chromatographic absorbents
        - Filter paper, filter aids, and glassware
        - Rubber and plastic protective clothing

7. Non-hazardous gases (e.g. carbon dioxide, nitrogen, argon, neon) may generally be vented to the atmosphere via a certified and functioning laboratory fume hood. Please check with EHSRM prior to such venting, particularly for large volumes.

B. Empty Containers

Use the flow chart below to determine how to properly dispose of empty chemical containers. The container must be truly empty. Not a drop of liquid, or any solid residue that could be scraped out, may be present.



C. Non Contaminated Glass

When a laboratory on campus wishes to dispose of glassware, empty bottles, glass pipettes, test tubes etc. (that is free of radiological, chemical, or biological hazards) the waste can be placed by the laboratory personnel into a cardboard box or other closable rigid container, then placed directly in the dumpsters located outside most of the buildings. Custodial Services will not pick up broken glass or empty chemical containers of any kind. Follow the procedures below for proper disposal of broken and/or waste glass.

1. All glass must be free of chemical, biological, or radioactive contamination before packaging of the material begins.
2. Contaminated glass must be thoroughly cleaned of all visible contamination. Pipettes cannot have appreciable amounts of liquid still inside them. Chemically contaminated glassware must have been triple rinsed and the rinse water collected as hazardous waste. Biological contamination must have been sterilized or sanitized to ensure all organisms, pathogens, or viruses are dead. Radioactive contaminated glassware should be sent out as radioactive waste and not packaged with other glass waste.
3. After the waste generator has ensured that the glass is free of all hazardous contaminants, the glass must be packaged in either a broken glass receptacle, a thick cardboard box, or other rigid container then taped closed.
4. Each container should be no more than 90% full and weigh less than 20 pounds.
5. The container must be marked with the words "Broken Glass" and be taped shut with no protruding shards of glass or pipettes sticking out to prevent injury
6. The generator must ensure the material placed in these receptacles is dry. Wet material will damage the bottoms of the receptacles causing the bottoms to become weakened and difficult to pick up.
7. Take the waste glass container directly to the outside dumpster for disposal.

IX. Chemical Waste Spill Procedures

Should a chemical waste spill occur, the following information will help the user or responsible person with proper cleanup activities:

It is the responsibility of each individual using a hazardous material to become familiar with the emergency response procedures which govern his or her facility. The Safety Data Sheet (SDS) for the chemical is a good source for specific information. Additional detailed information on chemical spill procedures can be found in the appropriate safety manuals (Laboratory Safety, Biological Safety, & Radiation Safety) found on the EHSRM website at http://www.sfasu.edu/safety/.

The following general rules should be followed in the event of a hazardous chemical spill:

A. The user responsible (or supervisor) should clean up a spill that hasn't been released to the environment, small enough to be safely cleaned up, and does not require specialized equipment. (i.e., spills that do not pose a hazard beyond that which the users typically deal with should be cleaned by the user group). A spill that cannot be safely cleaned up by the user department shall be reported to the EHSRM Department at 468-6034 during normal business hours of 8-5 M-F. For all emergencies or spills outside of normal business hours, contact the University Police Department (UPD) at 468-2608.
B. All hazardous chemical spills released into the environment (i.e. soil, water, air, sanitary sewer, or storm drain) should be reported to and evaluated by the EHSRM Department (468-6034) who will assist with the appropriate clean up response and reporting as needed.

Appendix A

Hazardous Waste Management
Employee Training Roster

Department/Work Area: _____

Instructor: _____ Date: _____

Employee Name (Print)	Employee Signature	Job Title

All Hazardous Waste Training shall be documented on the Hazardous Waste Training Roster, which shall be forwarded to the Environmental Health Safety and Risk Management Department (Box 6113) after every training session.

Appendix B

Waste Stream Determination Form

Laboratories and work areas at Stephen F. Austin State University who generate waste are required to determine if any of their waste is hazardous. Only household waste is exempt from this requirement. This technical guidance document explains the steps involved in making a waste determination and the associated documentation requirements.

Making Waste Determinations

Hazardous waste determinations must be done for every waste stream generated within a lab or work area. Breaking the waste determination into steps can make it easier to complete the process.

Step 1

Make a list of all waste streams being generated. List what process generates each waste stream, and document how many pounds of each waste stream are generated on the form attached.

Step 2

Check to see if each waste meets the definition of "solid waste" as found in the Code of Federal Regulations, 40 CFR 261.2. Waste is considered solid waste if it:

- Is a solid or a liquid (or in some cases a gas) that is discarded, abandoned, recycled, or considered inherently waste-like; and
- Is not otherwise exempt from the definition of solid waste under 40 CFR 261.4(a).

One common way materials become exempt from the definition of solid waste is when they are discharged to a sewer or drain that is regulated under the Clean Water Act, or, for example an NPDES discharge point, a pre-treatment system, or a Wastewater Treatment Facility.

Step 3

Record how the analysis of the waste was made. Record any methods used and attach any outside documentation for the analysis, such as analytical results or SDS. If user knowledge was used to make the determination, indicated that here and explain the reason for the determination.

Step 4

Indicate here whether or not the waste is hazardous. If it is hazardous, list the hazardous characteristics (eg. Corrosive, toxic, flammable, reactive). Applicable waste codes can be found on the website under the "Listed Hazardous Waste" pdf.

Documenting Waste Determinations

Maintain documentation of Steps 1 through 4 This documentation must be kept for 3 years from the last date the waste was shipped.

Adequate documentation will include a statement about whether or not the waste is hazardous as well as copies of all documents used in Steps 1 through 3. Documentation is required for all wastes, both non-hazardous and hazardous. Some examples of documentation that may be included are:

- Safety Data Sheets (SDSs);
- Process flow diagrams;
- Analytical results from a laboratory; and
- Chemical reaction diagrams.

Summary

Adequate determinations are the foundation of any good hazardous waste management program. Conducting an adequate determination for each waste stream and properly documenting that determination will help facilities stay in compliance and avoid costly mistakes. For additional information regarding proper management of solid or hazardous waste at SFA or help completing the required documentation you may contact Matt Romig at (936)-468-6034 or romigmatt@sfasu.edu

WASTE STREAM DETERMINATION FORM NO. 1: SFA
Created: July 2017

Waste Stream Determination Form

Building Name and Room Number:_____

STEP 1:
Waste Name:_____

Description of Process:_____
_____
_____
_____
_____
Amount of waste generated each month:_____

STEP 2: Does this waste meet the definition of a solid waste? YES NO

STEP 3:
Was laboratory analysis used to make this determination? YES NO
If yes, record the name and method for the laboratory analysis:_____
Attach a copy of the analytical results to this sheet.
Was knowledge of the process used to make this determination? YES NO
If yes, explain the reason for this determination and attach any applicable Safety Data Sheets
_____
_____
_____
_____

STEP 4:
Is this waste non-hazardous? YES NO
Is this waste a listed hazardous waste? YES NO
If yes, list hazardous waste characteristics:_____
_____

Name and title of the person making the determination:_____
Contact Phone:_____Email:_____
Date:_____

Appendix C

EPA'S "P" List (Acutely Hazardous Chemicals)

CAS Number	Chemical Name
107-20-0	Acetaldehyde, chloro-
591-08-2	Acetamide, N-(aminothioxomethyl)-
640-19-7	Acetamide, 2-fluoro-
62-74-8	Acetic acid, fluoro-, sodium salt
591-08-2	1-Acetyl-2-thiourea
107-02-8	Acrolein
116-06-3	Aldicarb
309-00-2	Aldrin
107-18-6	Allyl alcohol
20859-73-8	Aluminum phosphide
2763-96-4	5-(Aminomethyl)-3-isoxazolol
504-24-5	4-Aminopyridine
131-74-8	Ammonium picrate
7803-55-6	Ammonium vanadate
506-61-6	Argentate (1-), bis(cyano-C)-, potassium
7778-39-4	Arsenic acid
1327-53-3	Arsenic oxide
1303-28-2	Arsenic pentoxide
1327-53-3	Arsenic trioxide
692-42-2	Arsine, diethyl-
696-28-6	Arsonous dichloride, phenyl-
151-56-4	Aziridine
75-55-8	Aziridine, 2-methyl-
542-62-1	Barium cyanide
106-47-8	Benzeneamine, 4-chloro-
100-01-6	Beneneamine, 4-nitro-
100-44-7	Benzene, (chloromethyl)-
51-43-4	1, 2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-
12-09-8	Benzeneethanamine, alpha, alpha-dimethyl-
108-98-5	Benzenethiol
81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, and salts
100-44-7	Benzyl chloride
7440-41-7	Beryllium powder
598-31-2	Bromoacetone

357-57-3	Brucine
39196-18-4	2-Butanone, 3, 3-dimethyl-1-(methylthio)-O-[(methylamino)carbonyl]oxime
592-01-8	Calcium cyanide
75-15-1	Carbon disulfide
75-44-5	Carbonic dichloride
107-20-0	Chloroacetaldehyde
106-47-8	p-Chloroaniline
5344-82-1	1-(o-Chlorophenyl)thiourea
542-76-7	3-Chloropropionitrile
544-92-3	Copper cyanide
	Cyanide salts (soluble)
460-19-5	Cyanogen
506-77-4	Cyanogen chloride
131-89-5	2-Cyclohexyl-4, 6-dinitrophenol
542-88-1	Dichloromethyl ether
696-28-6	Dichlorophenylarsine
60-57-1	Dieldrin
692-42-2	Diethylarsine
311-45-5	Diethyl-p-nitrophenyl phosphate
297-97-2	O, O-Diethyl O-pyrazinyl phosphorothioate
55-91-4	Diisopropylfluorophosphate (DFP)
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)-
465-73-6	1, 4, 5, 8-Dimethanonaphtahalen, 1, 2, 3, 4, 10, 10, hexa- chloro-1, 4, 4a, 5, 8, 8a-hexahydro-, (1alpha, 4alpha, 4abeta, 5beta, 8beta, 8abeta)-
60-57-1	2, 7:3, 6-Dimethanonaphth[2, 3-b]oxirene, 3, 4, 5, 6, 9, 9-hexa-chloro- 1a, 2, 2a, 3, 6, 6a, 7, 7a-octahydro-, (1aalpha, 2beta, 2aalpha, 3beta, 6beta, 6aalpha, 7beta, 7aalpha)-
72-20-8	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, 2abeta, 3alpha, 6alpha, 6abeta, 7beta, 7aalpha)- and metabolites
60-51-5	Dimethoate
122-09-8	alpha, alpha-Dimethylphenethylamine
534-52-1	4, 6-Dinitro-o-cresol, and salts
51-28-5	2, 4-Dinitrophenol
88-85-7	Dinoseb
152-16-9	Diphosphoramide, octamethyl-

107-49-3	Diphosphoric acid, tetratethyl ester
298-04-4	Disulfoton
541-53-7	Dithiobiuret
115-29-7	Endosulfan
145-73-3	Endothall
72-20-8	Endrin and metabolites
51-43-4	Epinephrine
460-19-5	Ethanedinitrile
16752-77-5	Ethanimidothioic acid, N[[(methylamino)carbonyl] oxy]-, methyl ester
107-12-0	Ethyl cyanide
151-56-4	Ethyleneimine
52-85-7	Famphur
7782-41-4	Fluorine
640-19-7	Fluoroacetamide
62-74-8	Fluoroacetic acid, sodium salt
628-86-4	Fulminic acid, mercury(2+) salt
76-44-8	Heptachlor
757-58-4	Hexaethyl tetraphosphate
79-19-6	Hydrazinecarbothioamide
60-34-4	Hydrazine, methyl-
74-90-8	Hydrocyanic acid
74-90-8	Hydrogen cyanide
7803-51-2	Hydrogen phosphide
465-73-6	Isodrin
2763-96-4	3(2H)-Isoxazolone, 5-(aminomethyl)-
62-38-4	Mercury, (aceto-O)phenyl-
628-86-4	Mercury fulminate
62-75-9	Methanamine, N-methyl-N-nitroso-
624-83-9	Methane, isocyanato-
542-88-1	Methane, oxybis(chloro-
509-14-8	Methane, tetranitro-
75-70-7	Methanethiol, trichloro-
115-29-7	6, 9-Methano-2, 4, 3-benzodioxathiepin, 6, 7, 8, 9, 10, 10-hexacloro-1, 5, 5a, 6, 9, 9a-hexahydro-, 3-oxide
76-44-8	4, 7-Methano-1H-indene, 1, 4, 5, 6, 7, 8, 8-heptachloro-3a, 4, 7, 7a-tetrahydro-
16752-77-5	Methomyl
60-34-4	Methyl hydrazine

624-83-9	Methyl isocyanate
75-86-5	2-Methyllactonitrile
298-00-0	Methyl parathion
86-88-4	alpha-Naphthylthiourea
13463-39-3	Nickel carbonyl
557-19-7	Nickel cyanide
54-11-5	Nicotine and salts
10102-43-9	Nitric oxide
100-01-6	p-Nitroaniline
10102-44-0	Nitrogen dioxide
10102-43-9	Nitrogen oxide
55-63-0	Nitroglycerine
62-75-9	N-Nitrosodimethylamine
4549-40-0	N-Nitrosomethylvinylamine
152-16-9	Octamethylpyrophosphoramide
20816-12-0	Osmium oxide
20816-12-0	Osmium tetroxide
145-73-3	7-Oxabicyclo(2, 2, 1)heptane-2, 3-dicarboxylic acid
56-38-2	Parathion
131-89-5	Phenol, 2-cyclohexyl-4, 6-dinitro-
51-28-5	Phenol, 2, 4-dinitro-
534-52-1	Phenol, 2-methyl-4, 6-dintro-, and salts
88-85-7	Phenol, 2-(1-methylpropyl)-4, 6-dinitro-
131-74-8	Phenol, 2, 4, 6-trinitro-, ammonium salt
62-38-4	Phenylmercury acetate
103-85-5	Phenylthiourea
298-02-2	Phorate
75-44-5	Phosgene
7803-51-2	Phosphine
311-45-5	Phosphoric acid, diethyl 4-nitrophenyl ester
298-04-4	Phosphorodithioic acid, O, O-diethyl S-[2-(ethylthio)ethyl] ester
298-02-2	Phosphorodithioic acid, O, O-diethyl S-[2-(ethylthio)methyl] ester
60-51-5	Phosphorodithioic acid, O, O-dimethyl S-[2-(methylamino)-2-oxoethyl]ester
55-91-4	Phosphorofluoridic acid, bis(1-methylethyl) ester
56-38-2	Phosphorothioic acid, O, O-diethyl O-(4-nitrophenyl) ester
297-97-2	Phosphorothioic acid, O, O-diethyl O-pyrazinyl ester
52-85-7	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] O, O-dimethyl ester

298-00-0	Phosphorothioic acid, O, O, -dimethyl O-(4-nitrophenyl) ester
78-00-2	Plumbane, tetraethyl-
151-50-8	Potassium cyanide
506-61-6	Potassium silver cyanide
116-06-3	Propanal, 2-methyl-2-(methylthio)-O-[(methylamino)carbonyl] oxime
107-12-0	Propanenitrile
542-76-7	Propanenitrile, 3-chloro
75-86-5	Propanenitrile, 2-hydroxy-2-methyl
55-63-0	1, 2, 3-Propanetriol, trinitrate
598-31-2	2, Propanone, 1-bromo
107-19-7	Propargyl alcohol
107-02-8	2-Propenal
107-18-6	2-Propen-1-ol
75-55-8	1, 2-Propylenimine
107-19-7	2-Propyn-1-ol
504-24-5	4-Pyridinamine
54-11-5	Pyridine, 3-(1-methyl-2-pyrrolidinyl)- and salts
12039-52-0	Selenious acid, dithallium (1+) salt
630-10-4	Selenourea
506-64-9	Silver cyanide
26628-22-8	Sodium azide
143-33-9	Sodium cyanide
57-24-9	Strychnidin-10-one, and salts
357-57-3	Strychnidin-10-one, 2, 3-dimethoxy-
57-24-9	Strychnine, and salts
7446-18-6	Sulfuric acid, dithallium (1+) salt
3689-24-5	Tetraethyldithiopyrophosphate
78-00-2	Tetraethyl lead
107-49-3	Tetraethyl pyrophosphate
509-14-8	Tetranitromethane
757-58-4	Tetraphosphoric acid, hexaethyl ester
1314-32-5	Thallic oxide
12039-52-0	Thallium(I) selenite
7446-18-6	Thallium(I) sulfate
3689-24-5	Thiodiphosphoric acid, tetraethyl ester
39196-18-4	Thiofanox
541-53-7	Thioimidodicarbonic diamide
108-98-5	Thiophenol

79-19-6	Thiosemicarbazide
5344-82-1	Thiourea, (2-chlorphenyl)-
86-88-4	Thiourea, 1-naphthalenyl-
103-85-5	Thiourea, phenyl-
8001-35-2	Toxaphene
75-70-7	Trichloromethanethiol
7803-55-6	Vanadic acid, ammonium salt
1314-62-1	Vandium oxide
1314-62-1	Vanadium pentoxide
4549-40-0	Vinylamine, N-methyl-N-nitroso-
81-81-2	Warfarin, and salts, greater than 0.3%
557-21-1	Zinc cyanide
1314-84-7	Zinc phosphide

Appendix D

EPA's "U" List

The primary hazardous properties of these materials have been indicated by the letter T (Toxicity), R (Reactivity), I (Ignitability) and C (Corrosivity). Absence of the letter indicates that the compound is only listed for toxicity. Chemicals in bold are commonly found in laboratories.

CAS Number	Chemical Name
30558-43-1	A2213
75-07-0	**Acetaldehyde (I)**
75-87-6	Acetaldehyde, trichloro-
62-44-2	Acetamide, N(4-ethoxyphenyl)-
53-96-3	Acetamide, N9Hfluoren2yl-
94-75-7	Acetic acid, (2, 4dichlorophenoxy), salts and esters
141-78-6	Acetic acid, ethyl ester (1)
301-04-2	Acetic acid, lead (2) salt
563-68-8	Acetic acid, thallium (1) salt
93-76-5	Acetic acid. (2, 4, 5trichlorophenoxy)
67-64-1	**Acetone (I)**
75-05-8	**Acetonitrile (I, T)**
98-86-2	**Acetophenone**
53-96-3	2Acetylaminofluorene
75-36-5	**Acetyl chloride (C, R, T)**
79-06-1	Acrylamide
79-10-7	Acrylic acid (I)
107-13-1	Acrylonitrile
61-82-5	Amitrole
62-53-3	**Aniline (I, T)**
75-60-5	Arsinic acid, dimethyl-
492-80-8	Auramine
115-02-6	Azaserine
2212-67-1	HAzepine 1carbothioic acid, hexchydro, S-ethylester.
50-07-7	Azirino(2', 3':3, 4)pyrrolo[1, 2a] indole4, 7dione, 6amino8{[(aminocarbonyl)oxy]methyl}1, 1a, 2, 8, 8a, 8bhexahydro8amethoxy5methyl, [laS(laalpha, 8beta, 8aalpha, 8balpha)]-
101-27-9	Barban
22781-23-3	Bendiocarb
22961-82-6	Bendiocarb phenol

17804-35-2	Benomyl
56-49-5	Benz(j)aceanthrylene, 1 2dihydro3methyl-
225-51-4	Benz(c)acridine
98-87-3	Benzal chloride
23950-58-5	Benzamide, 3, 5dichloro-N(l, ldimethyl2propynyl)-
56-55-3	Benz(a)anthracene
57-97-6	Benz(a)anthracene, 7, 12dimethyl-
62-53-3	Benzenamine (I, T)
492-80-8	Benzenamine, 4, 4'carbonimidoylbis(N, Ndimethyl-
3165-93-3	Benzenamine, 4chloro2methyl, hydrochloride
60-11-7	Benzenamine, NNdimethyl4(phenylazo)-
95-53-4	Benzenamine, 2methyl-
106-49-0	Benzenamine, 4methyl-
101-14-4	Benzenamine 4, 4'methylene-bis(2chloro-
636-21-5	Benzenamine 2methyl, hydrochloride
99-55-8	Benzenamine, 2methyl5nitro
71-43-2	Benzene (I, T)
510-15-6	Benzeneacetic acid, 4chloro-alpha(4chlorophenyl)-alphahydroxy, ethyl ester
101-55-3	Benzene, 1bromo4phenoxy
305-03-3	Benzenebutanoic acid, 4(bis(2chloroethyl)amino)
108-90-7	**Benzene, chloro**
25376-45-8	Benzenediamine, armethyl
117-81-7	1 2Benzenedicarboxylic acid, bis(2ethylhexyl)ester
84-74-2	1 2Benzenedicarboxylic acid, dibutyl ester
84-66-2	1 2, Benzenedicarboxylic acid, diethyl ester
131-11-3	1, 2Benzenedicarboxylic acid, dimethyl ester
117-84-0	1 2Benzenedicarboxylic acid, dioctyl ester
95-50-1	Benzene, 12dichloro
541-73-1	Benzene, 1, 3dichloro
106-46-7	Benzene, 1, 4dichloro
72-54-8	Benzene, 1, 1'(2, 2dichloroethylidene)bis(4chloro
98-87-3	Benzene, (dichloromethyl)
26471-62-5	Benzene 1, 3diisocyanatomethyl(R, T)
1330-20-7	Benzene, dimethyl(l, T)
108-46-3	1, 3Benzenediol
118-74-1	Benzene, hexachloro-
110-82-7	Benzene, hexahydro (I)
108-88-3	Benzene, methyl-

121-14-2	Benzene, lmethyl2, 4dintro-
606-20-2	Benzene, 2methyl1, 3dinitro-
98-82-8	Benzene, (lmethylethyl) (I)
98-95-3	Benzene, nitro-
608-93-5	Benzene, pentachloro-
82-68-8	Benzene, pentachloronitro-
98-09-9	Benzenesuffonic acid chloride (C, R)
98-09-9	Benzenesulfonyl Chloride (C, R)
95-94-3	Benzene, 1, 2, 4, 5tetrachloro-
50-29-3	Benzene, 1, 1'(2, 2, 2trichloroethylidene)bis(4-chloro-
72-43-5	Benzene, 1, 1'(2, 2, 2trichloroethylidene)bis (4methoxy-
98-07-7	Benzene, (trichloromethyl)-
99-35-4	Benzene, 1, 3, 5trinitro- (R, T)
92-87-5	Benzidine
181-07-2	1, 2Benzisothiazol3(2H)one, 1, 1dioxide and salts
94-59-7	1, 3Benzadioxole, 5(2propenyl)-
120-58-1	1, 3Benzodioxole, 5(1propenyl)-
94-58-6	1, 3Benzodioxole, 5propyl-
22781-23-3	1, 3 Benzodioxol4 ol, 2, 2dimethyl, methyl carbamate
22961-82-6	1, 3 Benzodioxol4 ol, 2, 2dimethyl,
1563-38-8	7Benzofuranol, 2, 3dihydro2, 2dimethyl
189-55-9	Benzo(rst)pentaphene
181-81-2	2H1Benzopyran2one, 4-hydroxy3(3oxo-1pheny-butyl), and salts, when present at concentrations of 0.3% or less
50-32-8	Benzo(a)pyrene
106-51-4	pBenzoquinone
98-07-7	Benzotrichloride (C, R, T)
1464-53-5	2, 2'Bioxirane
92-87-5	(1, 1 'Biphenyl)4, 4'diamine
91-94-1	(1, 1'Biphenyl)4, 4'diamine, 3, 3'dichloro-
119-90-4	(1, 1'Biphenyl)4, 4'diamine, 3, 3'dimethoxy-
119-93-7	(1, 1'Biphenyl)4, 4'diamine, 3, 3'dimethyl
75-25-2	Bromoform
101-55-3	4-Bromophenyl phenyl ether
87-68-3	1, 3Butadiene, 1, 1, 2, 3, 4, 4hexacloro-
924-16-3	1Butanamine, Nbutyl-Nnitroso-
71-36-3	**1Butanol (I)**
78-93-3	2Butanone (I, T)
1338-23-4	2Butanone, peroxide (R, T)

4170-30-3	2Butenal
764-41-0	2Butene, 1, 4dichloro- (I, T)
303-34-4	2Butenoic acid, 2methyl, 7[(2, 3dihydroxy2(1methoxyethyl)3methyl1oxobutoxy) methyl]2, 3, 5, 7atetrahydro1pyrrolizinlyl ester, (lS(lalpha(Z), 7(2S*, 3R*), 7aalpha
71-36-3	**nButyl alcohol (I)**
2008-41-5	Butylate
75-60-5	Cacodylic acid
13765-19-0	Calcium chromate
51-79-6	Carbamic acid, ethyl ester
615-53-2	Carbamic acid, methylnitroso, ethyl ester
10605-21-7	Carbamic acid, 1 Hbenzimidazol2yl, methyl ester
17804-35-2	Carbamic acid, (l[(butylamino)carbonyl)]Hbenzimidazol2yl), methyl ester
55406-53-6	Carbamic acid, butyl, 3iodo2propynyl ester
101-27-9	Carbamic acid, (3chlorophenyl), 4chloro2butynyl ester
122-42-9	Carbamic acid, phenyl, 1methylethyl ester
23564-05-8	Carbamic acid, [1, 2phenylenebis (iminocarbonothioyl) bis, dimethyl ester
79-44-7	Carbamic chloride, dimethyl-
136-30-1	Carbamodithioic acid, dibutyl, sodium salt
95-06-7	Carbamodithioic acid, diethyl, 2chloro2propenyl ester
148-18-5	Carbamodithioic acid, diethyl, sodium salt
128-03-0	Carbamodithioic acid, dimethyl, potassium salt
128-04-1	Carbamodithioic acid, dimethyl, sodium salt
144-34-3	Carbamodithioic acid, dimethyl, tetraanhydrosulfide with orthothioselenious acid
1111-54-6	Carbamodithioic acid, 1, 2ethanediylbis, salts and esters
51026-28-9	Carbamodithioic acid, (hydroxymethyl)methyl, monopotassium salt
137-42-8	Carbamodithioic acid, methyl, monosodium salt
137-41-7	Carbamodithioic acid, methyl, monopotassium salt
2303-16-4	Carbamothioic acid, bis(lmethylethyl), S(2, 3dichloro2propenyl) ester
2303-17-5	Carbamothioic acid. bis(lmethylethyl), S(2, 3, 3trichloro2-propenyl) ester
2008-41-5	Carbamothioic acid bis(2methylpropyl), S-ethyl ester
1114-71-2	Carbamothioic acid, butylethyl, Spropyl ester
1134-23-2	Carbamothiolc acid, cyclohexylethy, Sethyl ester
759-94-4	Carbamothioic acid, dipropyl, Sethyl ester
52888-80-9	Carbamothioic acid, dipropyl, S(phenylmethyl) ester
1929-77-7	Carbamothioic acid, dipropyl, Spropyl ester

63-25-2	Carbaryl
10605-21-7	Carbendazim
1563-38-8	Carbofuran phenol
6533-73-9	Carbonic acid, dithallium (1+) salt
353-50-4	Carbonic difluoride
79-22-1	Carbonochloridic acid, methyl ester (I.T)
353-50-4	Carbon oxyfluoride (R, T)
56-23-5	**Carbon tetrachloride**
75-87-6	Chloral
305-03-3	Chlorambucil
57-74-9	Chlordane, alpha and gamma isomers
494-03-1	Chlornaphazin
108-90-7	**Chlorobenzene**
510-15-6	Chlorobenzilate
59-50-7	pChloromcresol
110-75-8	2Chloroethyl vinyl ether
67-66-3	**Chloroform**
107-30-2	Chloromethyl methyl ether
91-58-7	betaChloronaphthalene
95-57-8	oChlorophenol
3165-93-3	4Chloroo-toluidine, hydrochloride
13765-19-0	**Chromic acid H2CrO4, calcium salt**
218-01-9	Chrysene
137-29-1	Copper, bis(dimethylcarbamodithioatoS, S')-
137-29-1	Copper dimethyldithiocarbamate
	Creosote
1319-77-3	Cresols (Cresylic acid)
4170-30-3	Crotonaldehyde
98-82-8	Cumene (I)
506-68-3	Cyanogen bromide (CN)Br
1134-23-2	Cycloate
106-51-4	2, 5Cyclohexadiene1, 4dione
110-82-7	**Cyclohexane (I)**
58-89-9	Cyclohexane, 1, 2, 3, 4, 5, 6hexachloro(1alpha, 2alpha, 3beta, 4alpha, 5alpha, 6beta)-
108-94-1	Cyclohexanone (I)
77-47-4	1, 3Cyclopentadiene, 1, 2, 3, 4, 5, 5hexachloro-
50-18-0	Cyclophosphamide
194-75-7	2, 4D, salts and esters

533-74-4	Dazomet
20830-81-3	Daunomycin
72-54-8	DDD
50-29-3	DDT
2303-16-4	Diallate
53-70-3	Dibenz(a.h)anthracene
189-55-9	Dibenzo(a, i)pyrene
96-12-8	1, 2Dibromo3chloropropane
84-74-2	Dibutyl phthalate
95-50-1	oDichlorobenzene
541-73-1	mDichlorobenzene
106-46-7	pDichlorobenzene
91-94-1	3, 3'Dichlorobenzidine
764-41-0	1, 4Dichloro2butene (I, T)
75-71-8	Dichlorodifluoromethane
75-35-4	1, 1Dichloroethylene
156-60-5	1, 2Dichloroethylene
111-44-1	Dichloroethyl ether
108-60-1	Dichloroisopropyl ether
111-91-1	Dichloromethoxy ethane
120-83-2	2, 4-Dichlorophenol
87-65-0	2, 6Dichlorophenol
78-87-5	1, 2Dichloropropane
542-75-6	1, 3Dichloropropene
1464-53-5	1, 2:3, 4Diepoxybutane (I, T)
123-91-1	1, 4Diethyleneoxide
5952-26-1	Diethylene glycol, dicarbamate
117-81-7	Diethylhexyl phthalate
1615-80-1	N, N'Diethylhydrazine
3288-58-2	O, ODiethyl Smethyl dithiophosphate
84-66-2	Diethyl phthalate
56-53-1	Diethylstilbesterol
94-58-6	Dihydrosafrole
119-90-4	3, 3'Dimethoxybenzidine
124-40-3	Dimethylamine (I)
60-11-7	pDimethylaminoazobenzene
57-97-6	7, 12Dimethylbenz(a) anthracene
119-93-7	3, 3'Dimethylbenzidine
80-15-9	alpha, alphaDimethylbenzyl hydroperoxide (R)

79-44-7	Dimethylcarbamoyl chloride
540-73-8	1, 1Dimethylhydrazine
540-73-8	1, 2Dimethylhydrazine
105-67-9	2, 4Dimethylphenol
131-11-3	Dimethyl phthalate
77-78-1	**Dlmethyl sulfate**
121-14-2	2, 4Dinitrotoluene
606-20-2	2, 6Dinitrotoluene
117-84-0	Dinoctyl phthalate
123-91-1	**1, 4Dioxane**
122-66-7	**1, 2Diphenylhydrazine**
142-84-7	Dipropylamine (I)
97-77-8	Disulfiram
621-64-7	Dinpropylnitrosamine
106-89-8	Epichlorohydrin
759-94-4	EPTC
75-07-0	Ethanal (I)
55-18-5	Ethanamine, Nethyl-Nnitroso-
101-44-8	Ethanamine, N, Ndiethyl-
91-80-5	1, 2Ethanediamine, N, NdimethylN'2pyridinylN'(2thienylmethyl)
106-93-4	Ethane, 1, 2dibromo-
75-34-3	Ethane, 1, 1dichloro-
107-06-2	Ethane, 1, 2dichloro-
67-72-1	Ethane, hexachloro-
111-91-1	Ethane, 1, 1'(methylenebis(oxy))bis(2chloro-
60-29-7	Ethane, 1, 1'oxybis (I)
111-44-4	Ethane, 1, 1'oxybis(2chloro-
76-01-7	Ethane, pentachloro-
630-20-6	Ethane, 1, 1, 1, 2tetrachloro-
79-34-5	Ethane, 1, 1, 2, 2tetrachloro-
62-55-5	Ethanethioamide
71-55-6	Ethane, 1, 1, 1trichloro-
79-00-5	Ethane, 1, 1, 2trichloro-
59669-26-0	Ethanimidothioic acid, N, N'(thiobis((methylimino)carbonyloxy)) bis, dimethyl ester
30558-43-1	Ethanimidothioic acid, 2(dimethylamino)Nhydroxy2oxo, methyl ester
110-80-5	Ethanol, 2ethoxy-
1116-54-7	Ethanol, 2, 2'(nitrosoimino)bis

5952-26-1	Ethanol, 2, 2'oxybis, dicarbamate
98-86-2	Ethanone, 1phenyl-
75-01-4	Ethene, chloro-
110-75-8	Ethene, (2chloroethoxy)-
75-35-4	Ethene, 1, 1dichloro-
156-60-5	Ethene, 1, 2dichloro, (E)
127-18-4	Ethene, tetrachloro-
79-01-6	Ethene, trichloro-
141-78-6	**Ethyl acetate (I)**
140-88-5	Ethyl acrylate (I)
51-79-6	Ethyl carbamate (urethane)
60-29-7	**Ethyl ether (I)**
14324-55-1	Ethyl Ziram
111-54-6	Ethylenebisdithiocarbamic acid, salts and esters
106-93-4	Ethylene dibromide
107-06-2	Ethylene dichloride
110-80-5	Ethylene glycol monoethyl ether
75-21-8	Ethylene oxide (I, T)
96-45-7	Ethylenethiourea
75-34-3	Ethylidene dichloride
97-63-2	Ethyl methacrylate
62-50-0	Ethyl methanesulfonate
14484-64-1	Ferbam
206-44-0	Fluoranthene
50-00-0	**Formaldehyde**
64-18-6	**Formic acid (C, T)**
110-00-9	Furan (I)
98-01-1	2Furancarboxaldehyde (I)
108-31-6	2, 5Furandione
109-99-9	Furan, tetrahydro (I)
98-01-1	Furfural (I)
110-00-9	Furfuran (I)
18883-66-4	Glucopyranose, 2deoxy2(3methyl3nitrosoureido)D-
18883-66-4	DGlucose 2deoxy2(((methylnitrosoamino)-carbonyl)amino)-
765-34-4	Glycidylaldehyde
70-25-7	Guanidine, NmethylN'-nitroNnitroso-
118-74-1	Hexachlorobenzene
87-68-3	Hexachlorobutadiene
77-47-4	Hexachlorocylopentadiene

67-72-1	Hexachloroethane
70-30-4	Hexachlorphene
1888-71-7	Hexachloropropene
302-01-2	Hydrazine (R, T)
1615-80-1	Hydrazine, 1, 2diethyl
57-14-7	Hydrazine, 1, 1dimethy
540-73-8	Hydrazine, 1, 2dimethyl
122-66-7	Hydrazine, 1, 2diphenyl
7664-39-3	**Hydrofluoric acid (C, T)**
7664-39-3	Hydrogen fluoride (C, T)
7783-06-4	Hydrogen sulfide
7783-06-4	Hydrogen sulfide H2S
80-15-9	Hydroperoxide, 1methyl-1phenylethyl (R)
96-45-7	2lmidazolidinethione
193-39-5	Indeno(1 2, 3cd)pyrene
55406-53-6	3lodo2propynyl nbutylcarbamate
14484-64-1	Iron, tris (dimethylcarbamodithioatoS, S')-
85-44-9	1, 3lsobenzofurandione
78-83-1	**Isobutyl alcohol (I, T)**
120-58-1	Isosafrole
143-50-0	Kepone
303-34-4	Lasiocarpine
301-04-2	Lead acetate
1335-32-6	Lead, bis(acetatoO)tetrahydroxytri-
7446-27-7	Lead phosphate
1335-32-6	Lead subacetate
58-89-9	Lindane
70-25-7	MNNG
108-31-6	Maleic anhydride
123-33-1	Maleic hydrazide
109-77-3	Malononitrile
148-82-3	Melphalan
7439-97-6	**Mercury**
137-42-8	Metam Sodium
126-98-7	Methacrylonitrile (I, T)
124-40-3	Methanamine, Nmethyl- (I)
74-83-9	Methane, bromo-
74-87-3	Methane, chloro (I, T)
107-30-2	Methane, chloromethoxy-

74-95-3	Methane, dibromo
75-09-2	**Methane, dichloro**
75-71-8	Methane, dichlorodifluoro-
74-88-4	Methane, iodo-
62-50-0	Methanesulfonic acid, ethyl ester
56-23-5	Methane, tetrachloro-
74-93-1	Methanethiol (I, T)
75-25-2	Methane, tribromo
67-66-3	Methane, trichloro-
75-69-4	Methane, trichlorofluoro-
57-74-9	4, 7Methano1 Hindene, 1 2, 4, 5, 6, 7, 8, 8octachloro2, 3, 3a, 4, 7, 7ahexahydro-
67-56-1	**Methanol (I)**
91-80-5	Methapyrilene
143-50-0	1, 3, 4Metheno2Hcyclobuta(cd)pentalen2one, 1, 1a, 3, 3a, 4, 5, 5, 5a, 5b, 6decachlorooctahydro-
72-43-5	Methoxychlor
67-56-1	Methyl alcohol (I)
74-83-9	Methyl bromide
504-60-9	1Methylbutadiene (I)
74-87-3	Methyl chloride (I, T)
79-22-1	Methylchlorocarbonate (I, T)
71-55-6	Methyl chloroform
56-49-5	3Methylcholanthrene
101-14-4	4, 4'Methylenebis(2chloroaniline)
74-95-3	Methylene bromide
75-09-2	Methylene chloride
78-93-3	Methyl ethyl ketone (MEK) (I, T)
7338-23-4	Methyl ethyl ketone peroxide (R, T)
74-88-4	Methyl iodide
108-10-1	Methyl isobutyl ketone (1)
80-62-6	Methyl methacrylate (I, T)
108-10-1	4-Methyl2pentanone (1)
56-04-2	Methylthiouracil
50-07-7	Mitomycin C
2212-67-1	Molinate
20830-81-3	5, 12Naphthacenedione, 8acetyl10((3amino2, 3, 6trideoxy)-alphaLlyxohexopyranosyl) oxy)7, 8, 9, 10tetrahydro6, 8, 11trihydroxy-1methoxy, (8Scis)-

134-32-7	1 Naphthalenamine
97-59-8	2Naphthalenamine
494-03-1	Naphthalenamine, N, N'-bis(2chloroethyl)-
91-20-3	**Naphthalene**
91-58-7	Naphthalene, 2chloro-
130-15-4	1, 4Naphthalenedione
72-57-1	2, 7Naphthalenedisulfonic acid, 3, 3'((3, 3'dimethyl((1, 1'biphenyl)4, 4'diyl))bis(azo)bi s(5amino4hydroxy), tetrasodium salt
63-25-2	1Naphthalenol, methylcarbamate
130-15-4	1, 4Naphthoquinone
134-32-7	alphaNaphthylamine
91-59-8	betaNaphthylamine
10102-45-1	Nitric acid, thallium (1+) saH
98-95-3	Nitrobenzene (I, T)
100-02-7	p-Nitrophenol
79-46-9	2Nitropropane (I, T)
924-16-3	NNitrosodinbutylamine
1116-54-7	NNitrosodiethanolamine
55-18-5	NNitrosodiethylamine
759-73-9	NNitrosoNethylurea
684-93-5	NNitrosoNmethylurea
615-53-2	NNitrosoNmethylurethane
100-75-4	NNitrosopiperidine
930-55-2	NNitrosopyrrolidine
99-55-8	5Nitrootoluidine
1120-71 -4	1, 2Oxathiolane, 2, 2dioxide
50-18-0	2H1, 3, 2Oxazaphosphorin2amine, N, N-bis(2chloroethyl)tetrahydro, 2oxide
75-21-8	Oxirane (I, T)
765-34-4	Oxiranecarboxyaldehyde
106-89-8	Oxirane, (chloromethyl)-
123-63-7	Paraldehyde
1114-71-2	Pebulate
608-93-5	Pentachlorobenzene
76-01-7	Pentachloroethane
82-68-8	Pentachloronitrobenzene(PCNB)
87-86-5	Pentachlorophenol
108-10-1	Pentanol, 4methyl-
504-60-9	1, 3Pentadiene (I)

62-44-2	Phenacetin
108-95-2	**Phenol**
95-57-8	Phenol, 2chloro-
59-50-7	Phenol, 4chloro3methyl-
120-83-2	Phenol, 2, 4dichloro
87-65-0	Phenol, 2, 6dichloro
56-53-1	Phenol, 4, 4'(1, 2diethyl1, 2ethenediyl)bis, (E)
105-67-9	Phenol, 2, 4-dimethyl-
1319-77-3	Phenol, methyl-
70-30-4	Phenol, 2, 2'methylenebis(3, 4, 6trichloro-
114-26-1	Phenol, 2(1methylethoxy), methylcarbamate
100-02-7	Phenol, 4nitro
87-86-5	Phenol, pentachloro
58-90-2	Phenol, 2, 3, 4, 6tetrachloro-
95-95-4	Phenol, 2, 4, 5trichloro
88-06-2	Phenol, 2, 4, 6trichloro
148-82-3	LPhenylalanine, 4-(bis(2chloroethyl)amino)
7446-27-7	Phosphoric acid, lead(2) salt (2:3)
3288-58-2	Phophorodithioic acid, O, Odiethyl, Smethyl, ester
108-95-2	Phosphorous sulfide (R)
85-44-9	Phthalic anhydride
109-06-8	2-Picoline
100-75-4	Piperidine, 1nitroso
120-54-7	Piperidine, 1, 1'(tetrathiodicarbonothioyl)bis
128-03-0	Potassium dimethyldithiocarbamate
51026-28-9	Potassium nhydroxymethylnmethyldithiocarbamate
137-41-7	Potassium nmethyldithiocarbamate
23950-58-5	Pronamide
107-10-8	1Propanamine (I, T)
621-64-7	1Propanamine, NnitrosoNpropyl
142-84-7	1Propanamine, Npropyl (I)
78-87-5	Propane, 1, 2dichloro-
109-77-3	Propanedinitrile
79-46-9	Propane, 2nitro (I, T)
108-60-1	Propane, 2, 2'oxybis(2chloro-
1120-71-4	1, 3Propane sultone
93-72-1	Propanoic acid, 2(2, 4, 5trichlorophenoxy)-
126-72-7	1Propanol, 2, 3dibromo, phosphate (3: 1)
78-83-1	1Propanol, 2methyl- (I, T)

67-64-1	2Propanone (I)
79-06-1	2Propenamide
96-12-8	Propane, 1, 2dibromo3chloro-
542-75-6	1Propane, 1, 3dichloro-
1888-71-7	1Propene, 1, 1, 2, 3, 3, 3-hexachloro-
107-13-1	2Propenenitrile
126-98-7	2Propenenitrile, 2methyl-(1, T)
79-10-7	2Propenoic acid (I)
140-88-5	2Propenoic acid, ethyl ester (I)
97-63-2	2Propenoic acid, 2methyl, ethyl ester
80-62-6	2Propenolc acid, 2methyl, methyl ester (I, T)
112-42-9	Propham
114-26-1	Propoxur
107-10-8	nPropylamine (I, T)
78-87-5	Propylene dichloride
52888-80-9	Prosulfocarb
123-33-1	3, 6Pyridazinedione, 1, 2dihydro-
110-86-1	**Pyridine**
109-06-8	Pyridine, 2methyl-
66-75-1	2, 4(1H, 3H)Pyrimidinedione, 5(bis(2chloroethyl)amino)-
56-04-2	4(1H)Pyrimidione, 2, 3dihydro-6-methyl2thioxo-
930-55-2	Pyrrolidine, 1nitroso-
50-55-5	Reserpine
108-46-3	**Resorcinol**
81-07-2	Saccharin and salts
94-59-7	Safrole
7783-00-8	Selenious acid
7783-00-8	Selenium dioxide
7488-56-4	Selenium sulfide
7488-56-4	Selenium sulfide SeS2 (R, T)
144-34-3	Selenium, tetrakis (dimethyldithiocarbamate)
115-02-6	LSerine, diazoacetate (ester)
93-72-1	Silvex (2, 4, 5TP)
136-30-1	Sodium dibutyldithiocarbamate
148-18-5	Sodium diethyldithiocarbamate
128-04-1	Sodium dimethyldithiocarbamate
18883-66-4	Streptozotocin
95-06-7	Sulfallate
77-78-1	Sulfuric acid, dimethyl ester

1314-80-3	Sulfur Phosphide (R)
93-76-5	2, 4, 5-T
1634-02-2	Tetrabutylthiuram disulfide
95-94-3	1, 2, 4, 5, Tetrachlorobenzene
630-20-6	1, 1, 1, 2Tetrachloroethane
79-34-5	1, 1, 2, 2Tetrachloroethane
127-18-4	Tetrachloroethylene
58-90-2	2, 3, 4, 6Tetrachlorophenol
109-99-9	**Tetrahydrofuran**
97-74-5	Tetramethylthiuram monosulfide
533-74-4	2H1, 3, 5Thiadiazine2thione, tetrahydro3, 5dimethyl
563-68-8	Thallium(l) acetate
6533-73-9	Thallium(l) carbonate
7791-12-0	Thallium chloride
7791-12-0	Thallium chloride TlCl
10102-45-1	Thallium(l) nitrate
62-55-5	Thioacetamide
59669-26-0	Thiodicarb
74-93-1	Thiomethanol (I, T)
137-26-8	Thioperoxydicarbonic diamide, [(H2N)C(S)]2S2 tetramethyl-
1634-02-2	Thioperoxydicarbonic diamide, tetrabutyl
97-77-8	Thioperoxydicarbonic diamide, tetraethyl
23564-05-8	Thiophanatemethyl
62-56-6	Thiourea
137-26-8	Thiram
108-88-3	**Toluene**
25376-45-8	Toluenediamine
26471-62-5	Toluene diisocyanate (R, T)
95-53-4	oToluidine
106-49-0	pToluidine
636-21-5	oToluidine hydrochloride
2303-17-5	Triallate
61-82-5	1H1, 2, 4Triazol3amine
71-55-6	1, 1, 1Trichloroethane
79-00-5	1, 1, 2Trichloroethane
79-01-6	Trichloroethylene
75-69-4	Trichloromonofluoromethane
95-95-4	2, 4, 5Trichlorophenol
88-06-2	2, 4, 6Trichlorophenol

101-44-8	Triethylamine
99-35-4	1, 3, 5Trinitrobenzene (R, T)
123-63-7	1, 3, 5Trioxane, 2, 4, 6trimethyl-
126-72-7	Tris (2, 3dibromopropyl) phosphate
72-57-1	Trypan blue
66-75-1	Uracil mustard
759-73-9	Urea, NethylNnitroso-
684-93-5	Urea, NmethylNnitroso-
1929-77-7	Vernolate
75-01-4	Vinyl chloride
181-81-2	Warfarin and salts, when present at concentrations of 0.3% or less
1330-20-7	**Xylene (I)**
50-55-5	Yohimban16carboxylic acid, 11, 17dimethoxy 18((3, 4, 5trimethoxybenzoyl)oxy), methyl ester, (3beta, 16beta, 17alpha, 18beta, 20alpha)-
14324-55-1	Zinc, bis(diethylcarbamodithioatoS, S')-
1314-84-7	Zinc phosphide Zn3P2, when present at concentrations of 10% or less

Appendix E

Hazardous Waste Tag

Print Your Name:_____

Building and Room Number:_____

Phone Number and Email Address:_____

Total Amount in Container:_____ Container Size:_____

Complete Chemical Composition: **(List % or amount of each constituent including water or solvent)**

_____

_____

_____

_____

Check if applicable:

_____ Flammable
_____ Corrosive pH _____
_____ Oxidizer
_____ Toxic
_____ Reactive/Explosive

I certify that this information is true and accurate to the best of my knowledge.

Signature:_____ Date:_____

Appendix F

Examples of Non-Hazardous Chemicals

This list is not all-inclusive. Acid waste (aqueous), neutralized to a pH between 5 and 11.5 and does not contain As, Ba, Cd, Cr, Pb, Hg, Se, Ag, Mn, Ni, Cu, or Zn.

A-B

- Actin
- A-Adenosine, free base
- Adenosine 2' & 3'-monophosphate, disodium salt
- Adenosine 2' & 3'-monophosphate, free acid
- Adenosine 2',3'-cyclic monophosphate, sodium salt
- Adenosine 3',5'-cyclic monophosphate, sodium salt
- Adenosine 3'-monophosphate, sodium salt
- Adenosine 5'-diphosphate, sodium salt
- Adenosine 5'-monophosphate
- Adenosine 5'-monophosphate, disodium salt
- Adenosine 5'-monophosphate, sodium salt
- Adonitol; Ribitol
- Agar; Bacto agar
- Agarose
- Alginic acid, sodium salt; Sodium alginate
- β-Alanine
- DL-Alanine
- L-Alanine
- Albumin, bovine
- Albumin, bovine, methylated
- Albumin, human
- Alcohol dehydrogenase
- Aldolase, type X
- DL-Aminobutyric acid; GABA

- 4-Amino-2-methyl-1-naphthol; Vitamin K5
- Amylase
- alpha-Amylase, type II-A
- alpha-Amylase, type VI-B
- β-Amylase, sweet potato
- Amyloglucosidase
- Amylose
- Apyrase, grade VI
- D-Arabinose
- L(+) Arabinose
- D-Arabitol
- Arginase
- Arginine
- L-(+)-Arginine
- D-Asparagine, monohydrate
- DL-Asparagine
- L-Asparagine
- Aspartamene; Asp-phe methyl ester; L-Aspartyl-L-phenylalanine methyl ester
- D-Aspartic acid
- DL-Aspartic acid
- L-Aspartic acid
- L-Aspartic acid, monosodium salt
- Autex developer and replenisher
- Baclofen
- Bacto peptone; Peptone
- Base waste (aqueous), neutralized to a pH between 5 and 11.5 (does not contain As, Ba, Cd, Cr, Pb, Hg, Se, Ag, Mn, Ni, Cu, or Zn)
- Bayberry wax
- Bentonite
- β-Glucuronidase, type VIII

- Betaine
- Bicuculline
- Bile salts
- Biocytin
- Bromelain

C-F

- Calcium citrate
- Calcium phosphate, monobasic
- Calcium sulfate (Drierite)
- Carbachol chloride
- Carbonic anhydrase
- Carboxymethyl cellulose
- Carboxypeptidase B, type I
- Carboxypeptidase Y
- Carminic acid
- Carrageenan, type II
- β-Carotene type IV; Carotene type III; Carotene, trans-β
- Carrageenan, type IV
- Casein
- Cellobiose, D(+)
- Cellulase type I, II, V, VI, and VII
- Cellulose
- Chalk; Protexulate; Calcium carbonate
- Chitin
- 2-Chloroadenosine (upto 15 mM)
- Chondroitin sulfate A, sodium salt
- CM Cellulose powder
- L-Citrulline
- Cocarboxylase

- Coenzyme A, sodium salt
- Collagen
- Collagenase
- alpha-Chymotrypsinogen A
- DL-Cystine
- Cytidine 2' and 3'-monophosphate, free acid
- Cytidine 2'-monophosphate, sodium salt
- Cytidine 5'-triphosphate, sodium salt
- Cytosine
- Dehydroisoandrosterone 3-sulfate, sodium salt dihydrate
- 2'-Deoxyadenosine 5'-triphosphate
- Deoxyepinephrine hydrochloride
- Deoxyribonucleic acid, type XV
- 2-Deoxy-D-ribose
- Deuterium oxide
- Dextran
- Dextrose
- 2',4'-Dimethylacetophenone
- DNA Polymerase I
- EDTA
- Egg albumin
- Elastase, type III
- Elastin-orcein
- Enolase
- D-Erythrose
- Fibrin
- Fibrinogen, human type I
- Fibronectin
- Flavin adenine dinucleotide
- Folic acid

- Fomblin oil
- D-Fructose
- β-D(-)-Fructose
- D-Fructose-1,6-diphosphatase
- Fumaric acid, potassium salt
- Fumaric acid, sodium salt

G-L

- Gelatin
- Glass beads
- alpha-Glucosidase, type I
- β-Glucosidase
- β-D(+)Glucose
- L-Glucose
- Glucose 6-phosphate dehydrogenase
- Glucose-6-phosphate
- Glutamic acid
- D-Glutamic acid
- DL-Glutamic acid
- L-Glutamic acid
- DL-Glutamic acid, monohydrate
- L-Glutamine in saline
- Glycerin
- D-glycogen
- Guanosine 3', 5'-cyclic monophosphate, sodium salt
- Guanosine 3'-monophosphate, sodium salt
- Guanosine 5'-monophosphate
- Guar gum
- Gum, karaya
- Gum, xanthan

- Heavy water (deuterium oxide)
- Hematin
- Hemin
- Hemoglobin
- Hexokinase
- Histone
- Hyaluronidase, type I-S
- Hydrocortisone
- Hydrocortisone acetate
- DL-Histidine
- DL-Homoserine
- Hydrogen peroxide (3% or below)
- Immunoglobulins (IgA, IgM, IgG, IgD, IgE)
- Ilford ID 11 (working solution concentration)
- Ilford 2000 RT developer #741759 (working solution concentration)
- Ilford 2150 XL developer #741816 (working solution concentration)
- Insulin
- Invertase, grade V
- Iron filings
- DL-Isoleucine
- Isoproterenol (up to 150 mM)
- Kaolin
- Kodak developer D-11 (working solution concentration)
- Kodak developer D-19 (working solution concentration)
- Kodak developer D-76 (working solution concentration)
- Kodak dektol developer (working solution concentration)
- Kodak microdol X-developer (working solution concentration)
- Kodak Technidol developer (working solution concentration)
- Kodalith developer A:B = 1:1 (working solution concentration)
- L-Lactic dehydrogenase, type XI

- L-Proline
- L-Serine
- L-Sorbose
- L-Threonine
- L-Valine
- D-Lactic dehydrogenase
- Lactoferrin
- β-Lactoglobulin
- alpha-Lactose
- Lectin
- Lectin from glycine max
- Lectin from triticum vulgaris peroxidase labeled
- DL-Leucine
- Locust bean gum (carob flour)
- Lysozyme, grade I (chicken egg)

M-P

- Magnesium hydroxide
- Magnesium sulfate
- D-(+)-Maltose, monohydrate
- alpha-D(+)-Melibiose
- Methyl cellulose
- Monoamine oxidase
- MXR RP-HC developer (working solution concentration)
- Myoglobin, human
- Myokinase
- A-NADP, tetrasodium salt; A-Nicotinamide adenine dinucleotide phosphate
- NADP; Nicotinamide adenine dinucleotide phosphate
- B-Nicotinamide adenine dinucleotide agarose
- B-Nicotinamide adenine dinucleotide phosphate, tetrasodium salt

- B-Nicotinamide adenine dinucleotide, disodium salt
- B-Nicotinamide mononucleotide
- Naloxone
- Nerve growth factor
- Neuraminidase, type X and type VIII
- Nifedipine
- Nimodipine
- p-Hydroxybenzoic acid propyl ester
- Pantothenic acid
- Pantothenic acid, hemicalcium salt; Calcium pantothenate; Vitamin B5, calcium salt
- DL-Pantothenic acid, hemicalcium salt
- Pectin
- Pectinase
- Penicillinase, type I
- Phentalamine (up to 1500 mM)
- Phenylephrine (up to 200 mM)
- Phosphatase alkaline, type VII-NT, bovine
- Phosphodiesterase
- Phosphodiesterase 3', 5'-cyclic nucleotide
- Polymeric materials, epoxys, adhesives and glues (Hardened, reacted, dried or solidified)
- Polyethylene glycol
- Polyvinyl alcohol
- Potassium bitartarate; Potassium hydrogen tartarate; Cream of Tartar
- Potassium sulfate
- Potassium thiosulfate
- Proline
- DL-Proline
- Propylene glycol

- Prostaglandin F1A antiserum from rabbit
- Protease inhibitor from rabbit skeletal muscle
- Pyridoxal phosphate

R-X

- Rennin
- Riboflavin
- D-Ribose 5-phosphate, disodium salt
- Ribonuclease A; Ribonuclease S; Ribonuclease T1
- Rosin gum; Rosin wood
- Saline solution (Less than 50% sodium chloride in water)
- Sarcosine
- DL-Serine
- Sodium ascorbate; Vitamin C, sodium
- Sodium chloride
- Sodium citrate
- Sodium phosphate
- Sodium sulfate
- D-Sorbitol
- Starch
- Streptokinase
- Strontium sulfate
- Succinamide
- Sucrose; table sugar
- DL-Threonine
- Thyroglobulin, bovine
- Tragacanth gum
- Transferrin, human
- Triethylene glycol
- Triolein

- Tris buffer (up to 0.1 M)
- Tropomyosin
- Trypsin inhibitor
- Valine
- D-Valine
- Vitamin K1; Phylloquinone; 2-methyl-3-phytyl-1, 4-naphthoquinone
- Xanthine oxidase
- Xylitol