Hazardous Waste Management Manual

Laboratory Safety Policies and Procedures

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Overview

The framework for hazardous waste regulation was established in 1976 by the Federal Resource Conservation and Recovery Act (RCRA). RCRA was enacted by Congress to protect human health and the environment from improper management of hazardous waste. RCRA introduced the concept that the generator of a waste is responsible for proper waste management from "cradle-to-grave" (i.e. from the laboratory to the waste's ultimate destruction). RCRA regulations may be found in 40 CFR Parts 260-279.

At AdventHealth University (AHU), all chemical waste disposals are managed by the Environment, Health and Safety Office (EHS). Hazardous chemicals are not allowed to be disposed of in drains, in the trash, or by evaporation. All chemical waste is required to be held in the generating location (this location is defined as a "satellite accumulation area") for subsequent pick-up and disposal by Environment, Health and Safety Office.

There are specific regulatory requirements for the individuals who generate and accumulate chemical waste. These individuals must properly identify and label all hazardous wastes in their workplace. They must properly store and submit requests for disposal of chemical wastes. Finally, they must minimize the amount of waste generated and recycle whenever possible.

The purpose of this document is to assist laboratories with this regulatory compliance. Every laboratory on campus is subject to unannounced inspections by both the Federal Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (DEP). Lack of compliance can result in citations and fines.

The regulatory requirements covered in this document include:

- Identification of hazardous wastes
- Labeling of hazardous waste containers
- Accumulation of hazardous wastes

Identifying a Hazardous Waste

The requirements described in this manual do not apply until a material becomes a waste. From a regulatory perspective, a waste is something that is spent, has no further use, or no intended use. A determination must be made for every waste generated at the AHU as to whether or not the waste should be considered a hazardous waste. A waste is determined to be hazardous by one of three means:

- It is on one of the EPA's lists of hazardous chemicals (see Appendix A for list)
- It meets the definition of at least one of the EPA-defined characteristics of toxicity, ignitability, reactivity, or corrosiveness
- The waste's generator, utilizing some outside source of information (MSDS, manufacturer's website, etc.) determines that the waste should be treated as hazardous

Waste

A material/chemical that has no intended use or reuse, including chemicals and materials from a spill clean-up.

Hazardous Waste
A waste that is EPA listed, possesses one of the EPA's hazardous characteristics, or is determined to be hazardous by review of the material's MSDS or other source.

As of June 1, 2015 use of the GHS (Globally Harmonized System) for classification and labeling of chemicals became mandatory. The pictograms used to inform users of the potential hazards the chemicals pose can be found in Appendix D of this manual.

Listed Hazardous Waste

The EPA has published four lists identifying hazardous wastes. Appendix A is a composite of approximately 850 chemicals that are recognized by the EPA and EHS as hazardous.

Acutely toxic hazardous wastes, also called "P-listed" wastes, comprise a portion of Appendix A. Any container that once held a P-listed waste must be triple rinsed before the container can be discarded. The rinsate cannot be put down the sink. An alternative would be to have a member of the EHS handle the unrinsed empty containers along with other chemical wastes.

EPA Characteristic Hazardous Wastes

A waste is hazardous if it exhibits any one of the four characteristics of a hazardous waste. The following are the four characteristics and a few examples of common wastes at the University:

Ignitable

- Flammable Liquids- Flashpoint <140° F Examples: Alcohols, Benzene, Toluene, Xylene, Acetonitrile
- Oxidizers Examples: Nitrates, Perchlorates, Bromates, Permanganates, Peroxides, Periodates
- Organic Peroxides Examples: Benzoyl Peroxide, Cumene Hydroperoxide, Methyl Ethyl Ketone Peroxide

Corrosive

Aqueous liquids with $pH \leq 2$ or $pH \geq 12.5$

- Inorganic Acids Examples: Hydrochloric Acid, Sulfuric Acid, Nitric Acid, Phosphoric Acid
- Organic Acids Examples: Formic Acid, Lactic Acid, Acetic Acid
- Bases Examples: Hydroxide solutions, Amines

Reactive

Reactive are materials which can react violently with water, create toxic and/or flammable gases when mixed with water, ignite or react upon exposure to air, or are capable of detonation at standard temperature and pressure.

- Sulfides and Cyanides
- Peroxide formers
- Alkali metals - Sodium, Potassium, Lithium
- Dinitro - and Trinitro - compounds - Picric Acid
- Carbonyl compounds
- Isocyanates
- Perchlorate crystal formers-Perchloric Acid

Toxic
A selected group of eight (8) heavy metals, ten (10) pesticides, and twenty-two (22) organic chemicals are classified as hazardous due to their toxicity characteristic. Any detectable amount of these chemicals must be identified on a hazardous waste label. The complete list is located in Appendix B.

Determined by Other Sources

Many chemicals which are not listed by the EPA and do not possess a characteristic of a hazardous waste are nonetheless hazardous. Consult the product's MSDS or other product information prior to disposal. If you are ever unsure of a waste's characteristics, contact a member of the EHS so that a waste determination can be made.

Accumulation Requirements

It is the responsibility of the Laboratory Coordinator to ensure that waste storage areas are maintained in accordance with applicable rules and regulations. Waste is accumulated only in areas classified as "satellite accumulation areas" in each laboratory. The Laboratory Coordinator must ensure that everyone in the lab has read and is familiar with the Hazardous Waste Management Manual. Once this familiarization training is accomplished, it must be documented by the individual's signature and this sheet must be maintained in the lab and provided upon request. See Appendix E for more information regarding the Satellite accumulation areas.

Hazardous waste at a satellite accumulation area can be accumulated as long as necessary, but the total quantity of all wastes at one Satellite Area can never exceed 55 gallons. Additionally, no more than 1 quart or 1 kilogram of an acutely hazardous waste (P-Listed Waste) may be accumulated at one time. Empty containers that once contained a P-listed waste must be triple rinsed prior to disposal, and the rinsate must be handled as a hazardous waste. P-listed wastes are identified in Appendix A with bold print and an asterisk.

All waste containers must have at least one (1) inch of headspace to allow for expansion. The exterior of the container must be free of chemical contamination. Leaking or overfilled containers must be repackaged before they will be transported by the EHS.
A "Hazardous Waste" label should be affixed to a container before any hazardous waste is put into the container.

Incompatible chemicals must not to be placed in the same container. The Lab Safety Manual provides a list of incompatible chemicals (also available in Appendix F). When placing a chemical into the waste container, consider venting to prevent over pressurization resulting from any abnormal reactions. The Lab Safety Manual provides a list of incompatible chemicals (also available in Appendix F).
A spill kit must be accessible to all lab personnel. The spill absorbent or neutralizer must be appropriate for the spilled chemical.

Do not hold unneeded chemicals or waste. Dispose of these promptly to ensure regulatory compliance and to maintain a safe workplace.

Labeling Requirements

Directions for Labeling

- The Hazardous Waste label must be placed on the container BEFORE any waste is put into the container.
- Abbreviations and formulas are not permitted.
- The % of each chemical constituent must be listed, and these %'s must total 100%. It is crucial to include water, if any, as part of the 100%.
- Ensure that the Laboratory Coordinator's, building, and room number are included on the label.
- Hazardous waste labels are not necessary on containers holding pure, unused product as long as the original label is legible. Simply place these containers in the waste accumulation area and include a Chemical Hazardous Waste Log form (Appendix G).
- Computer generated labels are acceptable as long as they say "Hazardous Waste" at the top and meet all the requirements.

Waste Segregation

For safety reasons and to comply with waste management policies, dispose (if possible) chemical waste into separate waste categories.

- Flammable Liquids & Oxidizers
- Acids
- Bases
- Oxidizers
- Halogenated Organic Compounds
- Non-halogenated Organic Compounds
- Oils
- Air Reactive Materials
- Water Reactive Materials
- Mercury & Mercury Compounds
- Ethidium Bromide
- Formalin/Formaldehyde
- Chromerge
- Photographic Waste
- Aqueous Heavy Metal Solutions

Container Compatibility

It is vital that chemical waste be compatible with its container. If the waste is placed in an inappropriate container, the container might disintegrate or rupture.

The following chemical wastes must be placed in glass containers. These chemicals cannot be placed in plastic high density polyethylene (HDPE) containers.

- amyl chloride
- aniline
- benzyl alcohol
- bromine
- bromobenzene
- bromoform
- butadiene
- butyric acid
- carbon disulfide
- concentrated acids

- cinnamon oil
- cresol
- cyclohexane
- o-dichlorobenzene
- p-dichlorobenzene
- diethyl benzene
- diethyl ether
- ethyl chloride, liquid
- nitrobenzene
- perchloroethylene
- nitric acid
- thionyl chloride
- trichloroethene
- trichloroethylene
- vinylidene chloride
- brominated & fluorinated solvent

Clean Glassware Policy

A cost saving measure that is employed at AHU is the disposal of CLEAN labware and glassware (Appendix C). All labware that has not been contaminated by chemicals listed in Appendix 'A' or 'B' may be disposed in the following ways.

All labware must be completely empty and rinsed, any original labels should be removed or defaced, and disposed in the normal solid waste (trash).

For glassware to be thrown away it must be completely empty and rinsed, any original labels should be removed or defaced. Then place the container in a cardboard box lined with a plastic bag. On the outside of the box, write the words "Clean Glassware," and the room number. Once the clean Glassware container is ready to be disposed, contact the EHS.

You may not dispose of sharps containers, red bags, or anything with the biohazard symbol on it in this manner.

Specific Waste Management Practices

Certain wastes generated at the University have special handling or labeling requirements.

Unknowns

Special effort should be exercised to prevent the generation of unknown wastes, since characterization of unknown wastes significantly increases the cost of disposal. To have unknowns picked up, place a Hazardous Waste label on the container with the word "Unknown" in the constituent's column, then add the unknown to a Chemical Hazardous Waste Log form (Appendix G).

Pharmaceutical Waste

There are many chemical and/or pharmaceutical compounds that are used in research or in the treatment of diseases that are also considered hazardous wastes by the EPA when disposed of. Call a member of the EHS for further guidance.

Gas Cylinders

Laboratory Coordinators should attempt to establish accounts with suppliers who will allow the return of unused product and empty cylinders. If possible, the entire contents of the cylinder should be used up. Laboratory Coordinators must ensure that aging cylinders are informed to the EHS for pick up before the integrity of the valve and cylinder is compromised. The department may be billed

directly for cylinders that require special handling and disposal procedures such as unknown or old cylinders.

Solder

Waste solder contains heavy metals, thus is not be able to be disposed of regularly in the trash. Used waste solder should be stored:

- A container with a lid
- The container should be labeled with the contents kept inside
- Container should also be labeled with a second label identifying it as hazardous waste
- The container should always be kept closed, unless more solder is being added to the container
- Full containers must be dated and disposed of promptly
- The waste container needs to be kept in a satellite waste accumulation area (which should be properly labeled/designated)

EHS should be contacted when the waste solder is full and Chemical Hazardous Waste Log form (Appendix G) should be filled out accordingly. The disposal of the waste solder should be disposed of at the same time as the other chemical waste disposal pickup. The government threshold for chemical waste is 100 kg/month.

Peroxide Formers

These compounds must be scheduled to be picked up within six (6) months after date of opening or one (1) year after date of receipt. Common peroxide formers are ethyl ether, ethylene glycol dimethyl ether (glyme), vinyl ethers, isopropyl ether, potassium metal, and sodium amide.

Dinitro and Trinitro Compounds

These compounds must be scheduled for picked before the contents have dried. These crystals can become shock sensitive when the moisture content is less than 10%. Picric acid is a common example of this type of compound.

Ethidium Bromide

Concentrated stock solutions must be scheduled for pick up as a hazardous laboratory waste. The rinsate and destained gels can be placed down the sink and into the trash. Stained gels should be stored in 5 gallon bucket, stored in the satellite accumulation areas and handled as a hazardous laboratory waste. Researchers concerned about discarding gels or solutions with lower or questionable amounts can have them handled as a hazardous laboratory waste.

Common-Named Reagents

The following reagents contain mercury and should be handled as hazardous waste:

- Dobbin’s Reagent
- Millon’s Reagent
- Hayem’s Solution
- Morell’s Solution
- Hopkins-Cole Reagent
- Nessler’s Reagent

- Hubb's Reagent
- Rohrbach's Solution
- Tyrosine Reagents
- Jacquemart's Reagent
- Sachsse's Solution
- Knapp's Solution
- Spiegler's Reagent
- Tanret's Reagent
- Meyer's Solution.
- Other hazardous reagents include: Flemming's Solution (osmium, chromic acid), Folin-Dennis Solution (mercuric cyanide), Fisher's Reagent (phenyl hydrazine), and Erlicki's Solution (chromium).

Photochemicals

Environment, Health and Safety Office recommends that labs which use large quantities of photochemicals have a silver recovery unit installed. This unit treats the spent fixer so that it may be discharged down the drain. If a silver recovery unit is not used, it must be the spent fixer must be handled as hazardous waste. The developer and stop bath must be combined in a container to neutralize the solutions before being put down the sink. No concentrated photochemicals of any kind can be placed in the trash or sink.

Used Oil

Used oil includes all vacuum pump oil, synthetic oil, transmission and brake fluids, lubricating greases, etc. Used oil must be stored in securely closed containers provided with secondary containment. The secondary containment must have the capacity to hold 110 % of the volume of the largest container within the containment area. Each used oil container must be labeled clearly with the words "Used Oil".

Spilled Materials

The spilled chemical and the absorbent must be packaged and handled as hazardous waste. The Hazardous Waste label and the Chemical Hazardous Waste Log form (Appendix G) must name the chemical(s) and the absorbent used.

Universal Wastes

Universal Wastes are EPA regulated wastes, but are not Hazardous Wastes if properly recycled. They include spent batteries, certain types of lamps and mercury containing devices or equipment. All universal waste containers must be labeled clearly with the appropriate label when waste is first added.

Batteries

Alkaline batteries can be disposed of in the trash. Large storage batteries and other batteries which contain hazardous metals such as mercury, lead, silver and cadmium must be scheduled for pick up with the EHS. All used batteries must be clearly labeled using one of the following phrases: "Universal Waste—Battery(ies)," or "Waste Battery(ies)," or "Used Battery(ies)."

- Laboratory PI and/or Laboratory Coordinator need to contact the environmental personnel within 24 hours to schedule the pick-up.

- Upon pick up, EVS will take to the final destination for recycling.

Lamps

High intensity discharge, or HID, and fluorescent bulbs must be scheduled for pick up with the EHS. All spent lamps/bulbs must be clearly labeled using of the following phrases: "Universals Waste-Lamps," "Waste Lamp(s), or "Used Lamps". The lamps should be disposed of within one year of the initial generation.

- Laboratory PI and/or Laboratory Coordinator need to contact the environmental personnel within 24 hours to schedule the pick-up.
- Upon pick up, EVS will place spent bulbs in a specified container to later be disposed.

Aerosol Containers

Aerosol containers may be disposed of in non-hazardous waste containers (trash). Cans containing any product or propellant remaining, should be disposed of by EHS.

- Laboratory PI and/or Laboratory Coordinator need to contact the environmental personnel within 24 hours to schedule the pick-up.
- Upon pick up, trained EVS will discard of any remaining product appropriately and then dispose of the cans in a proper area.

Mercury Containing Equipment

There are many types of equipment that contain elemental mercury. Before disposing of any of these types of equipment, you should verify that they do not contain mercury. All used mercury containing equipment must be labeled clearly as "Universal Waste—Mercury Containing Equipment," "Waste Mercury-Containing Equipment," or "Used Mercury-Containing Equipment."
Examples include:

- Heating and air conditioning thermostats
- Tilt switches used in silent light switches, washing machine lids, chest type freezers
- Pressure gauges, displacement/plunger relays
- Sump pump float switches
- Thermometers, manometers

Chemical Waste Pick-up Procedures

In order to have hazardous waste picked-up from your satellite accumulation area, submit a Chemical Waste Log form (Appendix G) to EHS.

Provide as much information about the contents of each container as possible. As a minimum, the chemicals' names, the number of containers, and the total weight or volume should be listed.
Submit a form for every container that needs to be picked up by the EHS.

Direct EHS personnel to the satellite accumulation area when they arrive to pick up the waste. When the chemicals are picked up, you will be asked to sign the pick-up request, acknowledging that the waste is properly labeled.

Spill Response and Clean up Procedures

If there is an immediate danger to health, life, property, or risk of an environmental release, evacuate the area and contact an emergency personnel immediately.

Each laboratory should have a spill kit. In the event of a spill which does not meet the above criteria; stop the spill, contain the spill, notify other's in area, and clean up immediately. All flames should be extinguished and spark-producing equipment turned off. All non-essential personnel should be evacuated.

After cleaning up the spill, place the chemical and absorbents in a container with a Hazardous Waste label on it. A Chemical Hazardous Waste Log form (Appendix G) should be submitted, as in other waste disposal. Ensure that the Hazardous Waste label identifies the absorbent and the chemical(s).

Electronic and Computer Disposal and Recycling

This policy ensures that all used electronic equipment designated for disposal, such as computer monitors, central processing units (CPUs), laptops, peripherals and other electronic equipment, are handled, stored, and disposed of in accordance with all applicable Federal, State, and Local Regulations, and with current University Polices regarding data security.
Prior to disposing of university-owned electronic equipment and computers, contact the EHS and complete the "Equipment Waste Log" form (Appendix H).
EHS is responsible for securing vendors that properly recycle, reuse, or dispose of electronic waste generated by the University. The EHS will manage all vendor activities pertaining to the disposal of electronic waste.

Waste Minimization

Waste minimization is any action that reduces the amount and/or toxicity of chemical wastes that must be shipped off-site for disposal as hazardous waste. The success of any waste minimization program is dependent on the conscientious participation of every individual at AHU. The methods of waste minimization are shown below.

Source Reduction

The most desirable method of waste minimization is source reduction. This is any activity that reduces or eliminates the generation of chemical hazardous waste at the source. This can be accomplished by good materials management, substitution of less hazardous materials, and good laboratory procedures. Examples include:

- Implement a waste minimization policy and train all employees and students.
- Re-evaluate procedures to see if a less hazardous or non-hazardous reagent could be used.
- Centralize purchasing of chemicals through one person in the department or laboratory.
- Date chemical containers when received so that older ones will be used first.
- Keep MSDS's for chemicals on file.
- Inventory chemicals and identify their location at least once a year.
- Update inventory when chemicals are purchased or used up.
- Purchase chemicals in the smallest quantities needed.
- Label all chemical containers to prevent the generation of unknowns.
- When considering a new procedure, obtain the chemicals needed from another lab or purchase small quantities initially.
- Consider the use of microscale experiments.
- Consider the use of demonstrations or video presentations as a substitute for some student experiments that generate chemical wastes.

- Consider the use of pre-weighed or pre-measured reagent packets where waste generation is high.
- Avoid the use of reagents containing arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver.
- Eliminate the use of chromic acid cleaning solutions altogether. Use non-hazardous solutions such as Alconox and Pierce RBS35.
- Substitute red liquid (spirit-filled), digital, or thermocouple thermometers for mercury thermometers when it is feasible.
- Consider using detergent and hot water for cleaning parts instead of solvents.
- Use latex-based paints which are typically non-hazardous. Excess latex paints should be recycled. Excess non-latex paints must be handled by the EHS as a hazardous waste.
- Utilize vendors that will recycle used antifreeze. Some vendors will recycle the antifreeze on site so the antifreeze never leaves the site.

Recycling

The second most desirable approach is recycling. When a waste material is used for another purpose, treated and reused in the same process, or reclaimed for another process, it is considered recycling. Examples include:

- When solvent is used for cleaning purposes, use contaminated solvent for initial cleaning and fresh solvent for final cleaning
- Purchase compressed gas cylinders (including lecture bottles) only from manufacturers who will accept empty cylinders.
- Return excess pesticides to the distributor.
- Have a silver recovery unit installed in photography laboratories. The unit removes the silver from the fixer solution.
- Do not contaminate used oil with solvents because this prevents the oil from being recycled.
- Increase solvent reuse through the use of solvent redistillation.
- Recirculate unused or excess chemicals within the department.
- Collect metallic mercury for reclamation.

Appendix A: Listed Hazardous Wastes

* P-Listed Waste – Requires glassware to be triple-rinsed

A2213
Acetaldehyde (I)
Acetaldehyde, chloro- *
Acetaldehyde, trichloro-
Acetamide, N-(aminothioxomethyl)- *
Acetamide, N-(4-ethoxyphenyl)-
Acetamide, N-9H-fluoren-2-yl-
Acetamide, 2-fluoro-*
Acetic acid,(2,4-dichlorophenoxy)-, salts & esters
Acetic acid, ethyl ester (I)
Acetic acid, fluoro-, sodium salt*
Acetic acid, lead(2+) salt
Acetic acid, thallium(1+) salt
Acetic acid, (2,4,5-trichlorophenoxy)-
Acetone (I) Acetone (10% or more)
Acetonitrile (I,T)
Acetophenone
Acetylaminofluorene, 2-
Acetyl chloride (C,R,T)
Acetyl-2-thiourea, 1-*
Acrolein*
Acrylamide
Acrylic acid (I)
Acrylonitrile
Aldicarb *
Aldicarb sulfone *
Allyl alcohol *
Aluminum phosphide (R,T) *
Aminomethyl-3-isoxazolol, 5- *
Aminopyridine, 4- *
Amitrole Ammonium picrate (R) *
Ammonium vanadate *
Aniline (I,T)
Argentate(1-), bis(cyano-C)-,potassium*
Arsenic (Contaminant)(5.0 mg/L or more)
Arsenic acid H-3 As O-4 *
Arsenic oxide As-2 O-3 *
Arsenic oxide As-2 O-5 *
Arsenic pentoxide *
Arsenic trioxide *
Arsine, diethyl- *
Arsinic acid, dimethyl-
Arsonous dichloride, phenyl- *
Auramine
Azaserine
H-Azepine-1-carbothioic acid, hexahydro-,S-ethyl ester
Aziridine *
Aziridine, 2-methyl- *
Azirino(2,3:3,4)pyrrolo(1,2-a)-indole, 6-amino-8-(((aminocarbonyl) oxylmethyl)-1,1a,2,8,8a,8b-hexahydro- 8a-methoxy-5-methyl-,[1aS-(1aalpha, 8beta,8aalpha,8balpha)]-
Barban
Barium(Contaminant)(100.0 mg/L or more)
Barium cyanide *
Bendiocarb
Bendiocarb phenol
Benomyl Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-
Benz[c]acridine
Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester
Benzal chloride
Benzamide, 3,5-dichloro-N-(1,1- dimethyl-2-propynyl)-
Benz[a]anthracene
Benz[a]anthracene, 7,12-dimethyl-
Benzenamine (I,T)
Benzenamine, 4,4'-carbonimidoylbis [N,N-dimethyl-
Benzenamine, 4-chloro- *
Benzenamine, 4-chloro-2-methyl-, hydrochloride
Benzenamine, N,N-dimethyl-4(phenylazo)-
Benzenamine, 2-methyl-
Benzenamine, 2-methyl,hydrochloride
Benzenamine, 2-methyl-5-nitro-
Benzenamine, 4-methyl-
Benzenamine, 4,4'-methylenebis [2-chloro]-
Benzenamine, 4-nitro- *
Benzene (I,T)
Benzene (10% or more)
Benzene (Contaminant)(0.5 mg/L or more)
Benzene, 1-bromo-4-phenoxy-
Benzene, chloro-
Benzene, (chloromethyl)- *

Benzene, 1,2-dichloro-
Benzene,1,2-dichloro(a.k.a ortho- dichloro-)(10% or more)
Benzene, 1,3-dichloro-
Benzene, 1,4-dichloro-
Benzene, 1,1'-(2,2-dichloroethylidene) bis[4-chloro-
Benzene, (dichloromethyl)-
Benzene, 1,3-diisocyanatomethyl- (R,T)
Benzene, dimethyl- (I,T)
Benzene, hexachloro-
Benzene, hexahydro-(I)
Benzene, methyl-
Benzene, 1-methyl-2,4-dinitro-
Benzene, 2-methyl-1,3-dinitro-
Benzene, (1-methylethyl)- (I)
Benzene, nitro-
Benzene, pentachloro-
Benzene, pentachloronitro-
Benzene, 1,2,4,5-tetrachloro-
Benzene, 1,1'-(2,2,2-trichloro- ethylidene) bis[4-chloro-
Benzene, 1,1'- (2,2,2-Trichloro- ethylidene)bis [4-methoxy-
Benzene, (trichloromethyl)-
Benzene, 1,3,5-trinitro-
Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-
Benzenediamine, ar-methyl-
Benzenedicarboxylic acid(1,2-), bis(2-ethylhexyl)ester
Benzenedicarboxylic acid(1,2),dibutyl ester
Benzenedicarboxylic acid(1,2), diethyl ester
Benzenedicarboxylic acid(1,2), dimethyl ester
Benzenedicarboxylic acid(1,2) dioctyl ester
Benzenediol(1,3)
Benzenediol(1,2-), 4-[1-hydroxy-2(methylamino) ethyl]-, (R) *
Benzeneethanamine(alpha,alpha- dimethyl-) *
Benzenesulfonic acid chloride (C,R)
Benzenesulfonyl chloride (C, R)
Benzenethiol *
Benzidine Benzisothiazol-3(2H)-one(1,2), 1,1-dioxide, & salts
Benzodioxole(1,3), 5-(2-propenyl)-
Benzodioxole(1,3-), 5-propyl-
Benzodioxole(1,3-), 5-(1-propenyl)- 1,3-
Benzodioxol-4-ol, 2,2-dimethyl- 1,3-
Benzodioxol-4-ol, 2,2-dimethyl-, methylcarbamate 7-Benzofuranol, 2,3-dihydro-2,2- dimethyl-
7-Benzofuranol,2,3-dihydro-2,2- dimethyl-,methylcarbamate *
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 *
Benzo[rst]pentaphene
Benzopyran-2-one(2H-1), 4-hydroxy-3-(3- oxo-1-phenylbutyl)-,& salts, when present at concentrations greater than 0.3% *
Benzopyran-2-one(2H-1), 4-hydroxy-3-(3- oxo-1-phenyl-butyl)-, & salts, when present at concentrations of 0.3% or less
Benzo[a]pyrene
p-Benzoquinone
Benzotrichloride (C,R,T)
Benzyl chloride *
Beryllium *
Bioxirane(2,2'-)
Biphenyl(1,1'-]-4,4'-diamine
Biphenyl(1,1']-4,4'-diamine, 3,3'- dichloro-
Biphenyl(1,1']-4,4'-diamine, 3,3'-dimethoxy
Biphenyl(1,1']-4,4'-diamine, 3,3'-dimethyl-
Bis(dimethylthiocarbamoyl) sulfide
Bis(pentamethylene)thiuram tetrasulfide
Bromoacetone *
Bromoform
Bromophenyl(4) phenyl ether
Brucine *
Butadiene(1,3), 1,1,2,3,4,4-hexachloro-
Butanamine(1), N-butyl_N-nitroso-
Butanol(1) (I)
Butanone(2-) (I,T)
Butanone(2),3,3-dimethyl-1-(methylthio)-,O[(methylamino)carbonyl] oxime *
Butanone(2-),peroxide (R,T)
Butenal(2)
Butene(2), 1,4-dichloro- (I,T)
Butenoic acid(2-), 2-methyl-, 7-[[2,3- dihydroxy-2-(1-methoxyethyl-3-methyl- 1-

oxobutoxy]methyl]-2,3,5,7a- tetrahydro-1H-pyrrolizin-1-ylester, [1S-[1alpha(Z),7(2S*,3R*), 7aalpha]]-
n-Butyl alcohol (I)
n-Butylalcohol (10%ormore)
Butylate
Cacodylic acid
Cadmium(Contaminant)(1.0 mg/L or more)
Calcium chromate
Calcium cyanide *
Calcuim cyanide Ca(CN)2 *
Carbamic acid, 1H-benzimidazol-2-yl, methyl ester
Carbamic acid, (1-((butylamino) carbonyl)-1H-benzimadazol 2-yl]-, methyl ester
Carbamic acid, butyl-, 3-iodo-2- propynyl ester
Carbamic acid,(3-chlorophenyl)-,4-chloro-2-butynyl ester
Carbamic acid, [(dibutylamino)-thio] methyl-,2,3-dihydro-‘2,2-dimethyl-7- benzofuranyl ester *
Carbamic acid,dimethyl-,1-[(dimethylamino)carbonyl]-5- methyl- 1H-pyrazol-3-yl ester *
Carbamic acid, dimethyl-, 3-methyl-1- (1-methylethyl)-1H-pyrazol-5-yl ester*
Carbamic acid, ethyl ester
Carbamic acid, methyl-,3-methylphenyl ester *
Carbamic acid, methylnitroso-, ethyl ester
Carbamic acid, phenyl-, 1- methylethyl ester
Carbamic acid, [1,2- phenylenebis (iminocarbonothioyl)]bis-, dimethyl ester
Carbamic chloride, dimethyl-
Carbamodithioic acid, dibutyl, sodium salt
Carbamodithioic acid, diethyl-, 2- chloro-2-propenyl ester
Carbamodithioic acid, diethyl-, sodium salt
Carbamodithioic acid, dimethyl-, potassium salt

Carbamodithioic acid, dimethyl-, sodium salt
Carbamodithioic acid, dimethyl-, tetraanhydrosulfide with orthoselenious acid
Carbamodithioic acid, 1,2- ethanediylbis-,salts&esters
Carbamodithioic acid,(hydroxymethyl) methyl-,monopotassium salt
Carbamodithioic acid, methyl-, monosodium salt
Carbamodithioic acid, methyl-, monopotassium salt
Carbamothioic acid, bis(1-methylethyl)- ,S-(2,3-dichloro-2-propenyl) ester
Carbamothioic acid,bis(1-methylethyl)- ,S-(2,3,3,-trichloro-2-propenyl) ester
Carbamothioic acid, bis(2- methylpropyl)-, S-ethyl ester
Carbamothioic acid, butylethyl-, S- propyl ester
Carbamothioic acid, cyclohexylethyl-, S-ethyl ester
Carbamothioic acid, dipropyl-, S-ethyl ester
Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester
Carbamothioic acid, dipropyl-, S-propyl ester
Carbaryl
Carbendazim
Carbofuran *
Carbofuran phenol
Carbon disulfide *
Carbon disulfide (10% or more)
Carbon oxyfluoride (R,T)
Carbon tetrachloride
Carbon tetrachloride (Contaminant) (0.5 mg/L or more)
Carbon tetrachloride (DEGREASING ONLY) (10% or more)
Carbonic acid, dithallium(1+) salt
Carbonic dichloride
Carbonic difluoride
Carbonochloridic acid, methyl ester (I,T)
Carbosulfan *
Chloral
Chlorambucil
Chlordane, alpha & gamma isomers
Chlordane (Contaminant)(0.03 mg/L or more)
Chlornaphazin
Chloroacetaldehyde *
p-Chloroaniline *
Chlorobenzene
Chlorobenzene (10% or more)
Chlorobenzene (Contaminant) (100.0 mg/L or more)
Chlorobenzilate Chloro(2-)-1,3-butadiene (HOC)

p-Chloro-m-cresol
Chloroethyl (2) vinyl ether
Chlorofluorocarbons (DEGREASING ONLY) (10% or more)
Chloroform
Chloroform (Contaminant) (6.0mg/L or more)
Chloromethyl methyl ether
Chloronaphthalene,
beta- Chloronaphthalene(2-) (HOC)
Chlorophenol (o-)
Chlorophenyl(1-o-)thiourea *
Chloropropionitrile(3-) *
Chloro-o-toluidine(4), hydrochloride
Chromic acid H-2 CrO-4, calcium salt
Chromium(Contaminant)(5.0 mg/L or more)
Chrysene Copper, bis (dimethylcarbamodithioato- S,S')-,
Copper cyanide *
Copper cyanide Cu(CN) *
Copper dimethyldithiocarbamate Corrosive (LIQUIDS ONLY) [pH < 2 or pH >12.5]
Creosote Cresol (Cresylic acid)
Cresol (Cresylic acid) (10% or more)
Cresol (Contaminant) (200.0 mg/L or more)
o-Cresol (Contaminant) (200.0 mg/L or more)
m-Cresol (Contaminant) (200.0 mg/L or more)
p-Cresol (Contaminant) (200.0 mg/L or more)
Cresylic acid (See Cresol)
Crotonaldehyde
Cumene (I)
m-Cumenyl methylcarbamate *
Cyanides(soluble cyanide salts), not otherwise specified *
Cyanide-bearing material (when pH between 2 and 12.5)
Cyanogen *
Cyanogen bromide (CN)Br
Cyanogen chloride *
Cyanogen Chloride (CN)Cl *
Cycloate
Cyclohexadiene(2,5-)-1,4-dione
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha, 5alpha,6beta)-
Cyclohexane (I)
Cyclohexanone (I)
Cyclohexanone (10% or more)
Cyclohexyl(2)-4,6-dinitrophenol *
Cyclopentadiene(1,3-), 1,2,3,4,5,5- hexachloro-
Cyclophosphamide
D(2,4-)(Contaminant)(10.0mg/Lormore) D(2,4-), salts & esters
Daunomycin
Dazomet
DDD
DDT
Diallate
Dibenzo[a,i]pyrene
Dibenz[a,h]anthracene
Dibromo(1,2-)-3-chloropropane
Dibutyl phthalate
o-Dichlorobenzene
o-Dichlorobenzene (10% or more)
m-Dichlorobenzene
p- Dichlorobenzene
Dichlorobenzene(1,4)(Contaminant) (7.5 mg/L or more)
Dichloro-2-butene(1,4) (I,T)
Dichloroisopropyl ether
Dichlorobenzidine(3,3')
1,4-Dichloro-2-butene
Dichlorodifluoromethane
Dichloroethane(1,2)(Contaminant) (0.5 mg/L or more)
Dichloroethylene(1,1)(Contaminant) (0.7 mg/L or more)
Dichloroethyl ether
Dichloroethylene(1,1)
Dichloroethylene(1,2)
Dichloromethane (a.k.a Methylene chloride) (10% or more)
Dichloromethane (DEGREASING ONLY) (10% or more)
Dichloromethoxy ethane
Dichloromethyl ether *
Dichlorophenol(2,4)
Dichlorophenol(2,6)
Dichlorophenylarsine *
Dichloropropene(1,3)
Dieldrin *
Diepoxybutane(1,2:3,4) (I,T)
Diethylarsine *
Diethylene glycol, dicarbamate

Diethyleneoxide(1,4)
Diethylhexyl phthalate
Diethylhydrazine (N,N-) N,N'-
Diethylhydrazine O,O-
Diethyl S-methyl dithiophosphate
Diethyl-p-nitrophenyl phosphate *
Diethyl phthalate
O,O-Diethyl O-pyrazinyl phosphorothioate *
Diethylstilbesterol
Dihydrosafrole
Diisopropylfluorophosphate (DFP) *
Dimethanonaphthalene(1,4,5,8)1,2,3,4, 10,10-hexachloro-1,4,4a,5,8,8a- hexahydro-,(1alpha,4alpha, 4abeta,5beta,8beta,8abeta)- *
Dimethanonaphthalene(1,4,5,8)1,2,3,4, 10,10-hexachloro-1,4,4a,5,8,8a- hexahydro-,(1alpha,4alpha,4abeta, 5alpha,8alpha,8abeta)- *
Dimethanonaphth(2,7:3,6)[2,3b]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)-, & metabolites *
Dimethanonaphth(2,7:3,6)[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)*
Dimethoate *
Dimethoxydenzidine(3,3')
Dimethylamine (I)
p-Dimethylaminoazobenzene
Dimethylbenz[a]anthracene(7,12)
Dimethylbenzidine(3,3') alpha.alpha-
Dimethylbenzylhydro- peroxide (R)
Dimethylcarbamoyl chloride
Dimethylhydrazine(1,1)

Dimethylhydrazine(1,2)
Dimethylphenol(2,4)
Dimethylphenethylamine(alpha,alpha-)*
Dimethyl phthalate
Dimethyl sulfate
Dimetilan*
Dinitro-o-cresol(4,6), and salts*
Dinitrophenol(2,4) *
Dinitrotoluene(2,4)
Dinitrotoluene(2,4) (Contaminant) (0.13 mg/L or more)
Dinitrotoluene(2,6)
Dinoseb*
Di-n-octyl phthalate
Dioxane(1,4)
Diphenylhydrazine(1,2)
Diphosphoramide, octamethyl- *
Diphosphoric acid,tetraethyl ester*
Dipropylamine (I)
Disulfoton *
Disulfiram
Dithiobiuret *
1,3-Dithiolane-2-carboxaldehyde, 2,4- dimethyl-,O-[(methylamino) carbonyl] oxime*
Ethyleneimine *
Endosulfan *
Endothall *
Endrin *
Endrin, and metabolites*
Endrin (a.k.a. 1,2,3,4,10,10-hexa chloro-1,7-epoxy-1,4,4a,5,6, 7,8, 8a- octahydro-1,4-endo, endo-5,8-dimeth ano-naphthalene(0.02 mg/L or more)
Epichlorohydrin
Epinephrine *
EPTC Ethanal (I)
Ethanal (I)
Ethanamine, N,N-diethyl-
Ethanamine, N-ethyl-N-nitroso-
Ethane, 1,2-dibromo-
Ethane, 1,1-dichloro-
Ethane, 1,2-dichloro-
Ethane, hexachloro-
Ethane, 1,1'-[methylenebis (oxy)]bis[2-chloro-
Ethane, 1,1'-oxybis- (I)
Ethane, 1,1'-oxybis[2-chloro-
Ethane, pentachloro-

Ethane, 1,1,1,2-tetrachloro-
Ethane, 1,1,2,2-tetrachloro-
Ethane, 1,1,1-trichloro-
Ethane, 1,1,2-trichloro-
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (10% or more)

Ethanediamine(1,2), N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-
Ethanedinitrile *
Ethanethioamide
Ethanimidothioic acid, 2-(dimethyl- amino)-N-hydroxy-2-oxo-,methyl ester
Ethanimidothioic acid, 2-(dimethyl- amino)-N-[[(methylamino) carbonyl] oxy]-2-oxo-, methyl ester *
Ethanimidothioic acid, N,N'-[thiobis[(methylimino) carbonyloxy]]bis-,dimethyl ester
Ethanimidothioic acid, N-[[(methyl-amino)carbonyl]oxy]-, methyl ester *
Ethanol, 2-ethoxy-
Ethanol, 2,2'-(nitrosoimino)bis-
Ethanol, 2,2'-oxybis-, dicarbamate
Ethanone, 1-phenyl-
Ethene, chloro-
Ethene, (2-chloroethoxy)-
Ethene, 1,1-dichloro-
Ethene, 1,2-dichloro-, (E)-
Ethene, tetrachloro-
Ethene, trichloro-
Ethoxyethanol(2-) (10%ormore)
Ethyl acetate (I)
Ethyl acetate (10% or more)
Ethyl acrylate (I)
Ethylbenzene (10% or more)
Ethyl carbamate (urethane)
Ethyl cyanide *
Ethylene(bis)dithiocarbamic acid, salts & ester
Ethylene dibromide
Ethylene dichloride
Ethylene glycol monoethyl ether
Ethyleneimine *
Ethylene oxide (I,T)
Ethylenethiourea
Ethyl ether (I)
Ethyl ether (10% or more)
Ethylidene dichloride
Ethyl methacrylate
Ethyl methanesulfonate
Ethyl ziram
Famphur *
Ferbam Flammable material (Liquid, solid, or gas)(Flash point 140 F (60 C)or less)
Fluoranthene
Fluorine*
Fluoroacetamide*
Fluoroacetic acid, sodium salt*
Formaldehyde
Formetanate hydrochloride*
Formic acid (C,T)
Formparanate*
Fulminic acid, mercury(2+)salt (R,T)*
Furan (I)
Furan, tetrahydro- (I)
Furancarboxaldehyde(2) (I)
Furandione (2,5)
Furfural (I)
Furfuran (I)
Glucopyranose, 2-deoxy-2-(3-methyl- 3-nitrosoureido)-, D-
D-Glucose, 2-deoxy-2-[[(methylnitroso- amino)-carbonyl]amino]-
Glycidylaldehyde
Guanidine, N-methyl-N'-nitro-N-nitroso-
Heptachlor *
Heptachlor(and its epoxide)(Contaminant)(0.008mg/L or more)
Hexachlorobenzene
Hexachlorobenzene(Contaminant) (0.13 mg/L or more)
Hexachlorobutadiene
Hexachlorobutadiene(Contaminant) (0.5 mg/L or more)
Hexachlorocyclopentadiene
Hexachloroethane
Hexachloroethane(Contaminant) (3.0 mg/L or more)
Hexachlorophene
Hexachloropropene
Hexaethyl tetraphosphate*
Hydrazine (R,T)
Hydrazinecarbothioamide*
Hydrazine, 1,2-diethyl-
Hydrazine, 1,1-dimethyl-
Hydrazine, 1,2-dimethyl-
Hydrazine, 1,2-diphenyl-
Hydrazine, methyl- *

Hydrocyanic acid*
Hydrofluoric acid (C,T)
Hydrogen cyanide*
Hydrogen fluoride (C,T)
Hydrogen phosphide*
Hydrogen sulfide
Hydrogen sulfide H-2 S
Hydroperoxide,1-methyl-1-phenylethyl-(R)
Imidazolidinethione(2)
Indeno[1,2,3-cd]pyrene 3-Iodo-2-propynyl-n-butylcarbamate
Iron dextran
Iron, tris (dimethylcarbamodithioato-S,S')-
Isobenzofurandione(1,3)
Isobutyl alcohol (I,T)
Isobutyl alcohol (10% or more)
Isodrin *
Isolan *
3-Isopropylphenyl N-methylcarbamate *
Isosafrole
Isoxazolone(3(2H)),5-(aminomethyl)- *
Kepone
Lasiocarpine
Lead (Contaminant)(5.0 mg/L or more)
Lead (Liquids-500mg/L or more)
Lead acetate
Lead, bis(acetato-O) tetrahydroxytri-
Lead phosphate
Lead subacetate
Lindane
Lindane(1,2,3,4,5,6-hexachlorocyclo-hexane, gamma isomer(0.4 mg/L or more)
Maleic anhydride
Maleic hydrazide
Malononitrile
Melphalan
Manganese, bis (dimethyl carbamodithioato-S,S')-, *
Manganese dimethyldithiocarbamate *
Mercury
Mercury(Contaminant)(0.2 mg/L or more)
Mercury, (acetato-O)phenyl- *
Mercury fulminate (R,T) *
Metam sodium
Methacrylonitrile (I,T)
Methanamine, N- methyl- (I)
Methananmine, N-methyl- N-nitroso- *
Methane, bromo-
Methane, chloromethoxy-
Methane, chloro- (I,T)
Methane, dibromo-
Methane, dichlorodifluoro-
Methane, dichloro- Methane, iodo-
Methane, isocyanato-*
Methane, oxybis[chloro- *
Methane, tetrachloro-
Methane, tetranitro- (R)*
Methane, tribromo-
Methane, trichloro-
Methane, trichlorofluoro-
Methanesulfonic acid, ethyl ester
Methanethiol (I,T)
Methanethiol, trichloro- *
Methanimidamide, N,N-dimethyl-N'- [3--[[(methylamino)-carbonyl] oxy]phenyl]-, monohydrochloride *
Methanimidamide, N,N-dimethyl-N'[2- methyl-4-([(methylamino)carbonyl] oxy]phenyl]- *
Methiocarb *
Metolcarb*
Methanol (I)
Methanol (10% or more)
Methano(6,9-)-2,4,3,benzo dioxathiepin 6,7,8,9,10,10-hexachloro-1,5,5a, 6,9,9a-hexahydro-, 3-oxide *
Methano-1H-indene(4,7),1,4,5,6,7,8, 8-heptachloro-3a,4,7,7a-tetrahydro- *
Methano(4,7)-1H-indene,1,2,4,5,6,7, 8,8-octachloro-2,3,3a,4,7,7a- hexahydro-
Methapyrilene
Metheno-2H-cyclobuta(1,3,4)[cd]pentalen- 2-one,1,1a,3,3a,4,5,5a,5b,6- decachlorooctahydro-
Methomyl *
Methoxychlor
Methoxychlor (a.k.a. 1,1,1-Trichloro- 2,2-bis[p-methoxyphenyl]ethane) (Contaminant)(10.0 mg/L or more)
Methyl alcohol (I)
Methyl bromide
Methylbutadiene(1) (I)

Methyl chloride (I,T)
Methyl chlorocarbonate (I,T)
Methyl chloroform
Methylcholanthrene (3-)
Methylene(4,4')bis(2-chloroaniline)
Methylene bromide
Methylene chloride (DEGREASING ONLY) (10% or more)
Methylene chloride
Methylene chloride (10% or more)
Methyl ethyl ketone peroxide (R,T)
Methyl ethyl ketone (MEK) (I,T)
Methyl ethyl ketone (10% or more)
Methyl ethyl ketone (Contaminant) (200.0 mg/L or more)
Methyl hydrazine *
Methyl iodide
Methyl isobutyl ketone (I)
Methyl isobutyl ketone(10% or more)
Methylisocyanate*
Methyllactonitrile(2)*
Methyl methacrylate (I,T)
1-Methyl-3-nitro-1-nitrosoguanidine
Methyl parathion *
Methyl(4-)-2-pentanone (I)
Methylthiouracil
Mexacarbate *
Mitomycin CMNNG (a.k.a. 1-Methyl-3-nitro-1-nitrosoguanidine)
Molinate
Naphthacenedione(5,12), 8-acetyl- 10-[(3-amino -2,3,6-trideoxy)- alpha-L-lyxo-hexopyranosyl)oxy]- 7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-
Naphthalenamine(2-)
Naphthalenamine, N,N'-bis(2- chloroethyl)-
Naphthalene
Naphthalene, 2-chloro-
Naphthalenamine(1-)
Naphthalenedione(1,4)
Naphthalenedisulfonic acid(2,7),3,3'- [(3,3'-dimethyl[1,1'-biphenyl]4,4'- diyl)bis(azo)bis[5-amino-4-hydroxy]-,tetrasodium salt
1-Naphthalenol, methylcarbamate
Naphthoquinone(1,4) alpha-Naphthylamine
beta-Naphthylamine
alpha-Naphthylthiourea *
Nickel carbonyl *
Nickel carbonyl Ni(CO)4,(T-4)- *
Nickel cyanide *
Nickel cyanide Ni(CN)2 *
Nicotine, and salts *
Nitric acid, thallium(1+) salt
Nitric oxide *
p-Nitroaniline *
Nitrobenzene (I,T)
Nitrobenzene (10% or more)
Nitrobenzene(Contaminant) (2.0 mg/L or more)
Nitrogen dioxide *
Nitrogen oxide NO *
Nitrogen oxide NO2 *
Nitroglycerine (R) *
p-Nitrophenol
Nitropropane(2) (I,T)
Nitropropane(2) (10%or more)
N-Nitrosodi-n-butylamine
N-Nitrosodiethanolamine
N-Nitrosodiethylamine
N-Nitrosodimethylamine *
N-Nitroso-N-ethylurea
N-Nitroso-N-methylurea
N-Nitroso-N-methylurethane
N-Nitrosomethylvinylamine *
N-Nitrosopiperidine
N-Nitrosopyrrolidine
Nitro(5-)-o-toluidine
Octamethylpyrophosphoramide *
Osmium oxide OsO4, (T-4)- *
Osmium tetroxide *
Oxabicyclo(7)[2.2.1]heptane-2,3- dicarboxylic acid *
Oxamyl *
Oxathiolane(1,2-),2,2-dioxide
Oxazaphosphorin(2H-1,3,2-)-2-amine,N,N-bis(2-chloroethyl)tetrahydro-,2-oxide
Oxidizer (Liquid and Solid)
Oxirane (I,T)
Oxiranecarboxyaldehyde
Oxirane, (chloromethyl)-
Paraldehyde
Parathion *

Pebulate
Pentachlorobenzene
Pentachlorodibenzo-p-dioxins (HOC)
Pentachlorodibenzofuran
Pentachloroethane
Pentachloronitrobenzene (PCNB)
Pentachlorophenol
Pentachlorophenol(Contaminant) (100.0 mg/L or more)
Pentadiene(1,3) (I)
Pentanol, 4-methyl-
Phenacetin
Phenol
Phenol, 2-chloro-
Phenol, 4-chloro-3-methyl-
Phenol, 2-cyclohexyl-4,6-dinitro- *
Phenol, 2,4-dichloro-
Phenol, 2,6-dichloro-
Phenol, 4,4'-(1,2-diethyl-1,2- ethenediyl)bis-,(E)-
Phenol, 2,4-dimethyl-
Phenol, (3,5- dimethyl-4- (methylthio)-, methylcarbamate *
Phenol, 4- (dimethylamino)-3,5- dimethyl-,methylcarbamate(ester)*
Phenol, 2,4-dinitro- *
Phenol, methyl-
Phenol,2-methyl-4,6-dinitro-,and salts*
Phenol, 2,2'-methylenebis[3,4,6-trichloro]-
Phenol, 3-(1-methylethyl)-, methylcarbamate *
Phenol, 2-(1-methylethoxy)-, methylcarbamate
Phenol, 3-methyl-5-(1-methylethyl), methylcarbamate *
Phenol, 2-(1-methylpropyl)-4,6- dinitro- *
Phenol, 4-nitro-
Phenol, pentachloro-
Phenol, 2,3,4,6-tetrachloro-
Phenol, 2,4,5-trichloro-
Phenol, 2,4,6-trichloro-
Phenol,2,4,6-trinitro-, ammonium salt (R) *
L-Phenylalanine, 4-[bis(2- chloroethyl)amino]-
Phenylmercury acetate *
Phenylthiourea *
Phorate *
Phosgene *
Phosphine *
Phosphoric acid, diethyl 4- nitrophenyl ester *
Phosphoric acid, lead(2+) salt(2:3)
Phosphorodithioic acid,O,O-diethyl S-[2-(ethylthio)ethyl] ester *
Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester *
Phosphorodithioic acid, O,O-diethyl S-methyl ester
Phosphorodithioic acid, O,O- dimethyl S-[2-(methylamino)-2- oxoethyl] ester *
Phosphorofluoridic acid, bis(1- methylethyl) ester *
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester *
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester *
Phosphorothioic acid,O-[4-[dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester *
Phosphorothioic acid, O,O,-dimethyl O-(4-nitrophenyl) ester *
Phosphorus sulfide (R)
Phthalic anhydride
Physostigmine *
Physostigmine salicylate *
Picoline(2)
Piperidine, 1-nitroso-
Piperidine, 1,1'-(tetra thiodicarbonothioyl)-bis-
Plumbane, tetraethyl-
Polychlorinated Biphenols (PCB's) *
Potassium cyanide *
Potassium cyanide K(CN) *
Potassium dimethyldithiocarbamate
Potassium n-hydroxymethyl-n-methyldithiocarbamate
Potassium n-methyldithiocarbamate
Potassium silver cyanide *
Promecarb *
Pronamide
Propanal, 2-methyl-2-(methylithio)- ,O-[(methylamino)carbonyl]oxime *
Propanal, 2-methyl-2-(methyl- sulfonyl)-,O-[(methylamino) carbonyl] oxime *
Propanamine(1-) (I,T)
Propanamine(1-),N-nitroso-N-propyl-
Propanamine(1), N-propyl- (I)

Propane, 1,2-dibromo-3-chloro-
Propane, 1,2-dichloro-
Propane, 2,2'-oxybis[2-chloro-
Propane, 2-nitro- (I,T)
Propane sultone(1,3)
Propanedinitrile
Propanenitrile *
Propanenitrile, 3-chloro- *
Propanenitrile,2-hydroxy-2-methyl-*
Propanetriol(1,2,3),trinitrate (R)*
Propanoic acid, 2-(2,4,5- trichlorophenoxy)-
Propanol(1), 2,3-dibromo-, phosphate (3:1)
Propanol(1), 2-methyl- (I,T)
Propanone(2) (I)
Propanone(2), 1-bromo- *
Propargyl alcohol *
Propenal(2) *
Propenamide(2)
Propenenitrile(2)
Propenenitrile(2), 2-methyl- (I,T)
Propene(1), 1,3-dichloro-
Propene(1), 1,1,2,3,3,3-hexachloro-
Propenoic acid(2), ethyl ester (I)
Propenoic acid(2) 2-methyl-, ethyl ester
Propenoic acid(2), 2-methyl-, methylester (I,T)
Propenoic acid(2) (I)
Propen(2-)-1-ol *
Propham
Propoxur
n-Propylamine (I,T)
Propylene dichloride
Propylenimine(1,2) *
Di-n-propylnitrosamine
Propyn(2-)-1-ol *
Prosulfocarb
Pyridazinedione(3,6) 1,2-dihydro-
Pyridinamine(4) *
Pyridine
Pyridine (10% or more)
Pyridine (Contaminant) (5.0 mg/L or more)
Pyridine, 2-methyl-
Pyridine, 3-(1-methyl-2-pyrrolidiny)-, (S)-, & salts *
Pyrimidinedione(2,4-(1H,3H)), 5-[bis(2-chloroethyl)amino]-
Pyrimidinone(4(1H)), 2,3-dihydro-6- methyl-2-thioxo-
Pyrrolidine, 1-nitroso-
Pyrrolo[2,3-b]indol-5-ol,1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl,methyl- carbamate (ester),(3aS-cis)- *
Reactive Material (Liquid or Solid)
Reserpine Resorcinol
Saccharin, and salts
Safrole Selenious acid
Selenious acid, dithallium(1+)salt*
Selenium (Contaminant) (1.0 mg/L or more)
Selenium dioxide
Selenium sulfide
Selenium sulfide SeS-2 (R,T)
Selenium, tetrakis (dimethyldithiocarbamate)
Selenourea *
L-Serine, diazoacetate (ester)
Silver(Contaminant)(5.0 mg/L or more)
Silver cyanide *
Silver cyanide Ag(CN) *
Silvex (2,4,5-TP) Silvex(2,4,5-TP)(Contaminant) (1mg/L or more)
Sodium azide *
Sodium cyanide *
Sodium cyanide Na(CN) *
Sodium dibutyldithiocarbamate
Sodium diethyldithiocarbamate
Sodium dimethyldithiocarbamate
Streptozotocin
Strontium sulfide SrS *
Strychnidin-10-one,2,3-dimethoxy-*
Strychnidin- 10-one, and salts *
Strychnine, and salts *
Sulfallate Sulfide-bearing material (when pH between 2 and 12.5)
Sulfur phosphide (R)
Sulfuric acid, dimethyl ester
Sulfuric acid, dithallium(1+) salt*
T(2,4,5-) TP(2,4,5-) Silvex (2,4,5-Trichlorophenoxypropionic acid (Contaminant)(1.0 mg/L or more)
Tetrabutylthiuram disulfide
Tetrachlorobenzene(1,2,4,5)
Tetrachloroethane(1,1,1,2)
Tetrachloroethane(1,1,2,2)

Tetrachloroethylene (DEGREASING ONLY) (10% or more)
Tetrachloroethylene
Tetrachloroethylene (10% or more)
Tetrachloroethylene(Contaminant) (0.7 mg/L or more)
Tetrachlorophenol(2,3,4,6)
Tetraethyldithiopyrophosphate *
Tetraethyl lead *
Tetraethyl pyrophosphate *
Tetrahydrofuran (I)
Tetramethylthiuram monosulfide
Tetranitromethane (R) *
Tetraphosphoric acid, hexaethyl ester*
Thallic oxide *
Thallium(I) acetate
Thallium(I) carbonate
Thallium(I) chloride
Thallium chloride TlCl
Thallium(I) nitrate
Thallium oxide Tl-2 O-3 *
Thallium(l) selenite *
Thallium(l) sulfate *
2H-1,3,5-Thiadiazine-2-thione, tetrahydro-3,5-dimethyl-
Thioacetamide
Thiodicarb
Thiodiphosphoric acid, tetraethyl ester*
Thiofanox *
Thioimidodicarbonic diamide [(H-2N)C(S)]-2 NH *
Thiomethanol (I,T)
Thioperoxydicarbonic diamide, tetrabutyl
Thioperoxydicarbonic diamide, tetraethyl
Thioperoxydicarbonic diamide[(H-2N)C(S)]-2 S-2, tetramethyl-
Thiophanate-methyl
Thiophenol *
Thiosemicarbazide *
Thiourea
Thiourea, (2-chlorophenyl)- *
Thiourea, 1-naphthalenyl- *
Thiourea, phenyl *
Thiram
Tirpate *
Toluene
Toluene (10% or more)
Toluene diisocyanate (R,T)
Toluenediamine
o-Toluidine
p-Toluidine
o-Toluidine hydrochloride
Toxaphene *
Toxaphene(C10H10Cl8, Technical Chlorinated camphene,67-69% chlorine) (Contaminant)(0.5 mg/L or more)
Triallate
Triazol(1H-1,2,4-)-3-amine
Trichloroethane(1,1,1)(10% or more)
Trichloroethane(1,1,1) (DEGREASING ONLY) (10% or more)
Trichloroethane(1,1,2)
Trichloroethane(1,1,2)(10% or more)
Trichloroethylene (DEGREASING ONLY) (10% or more)
Trichloroethylene
Trichloroethylene (10% or more)
Trichloroethylene(Contaminant) (0.5 mg/L or more)
Trichlorofluoromethane(10% or more)
Trichloromethanethiol *
Trichloromonofluoromethane
Trichlorophenol(2,4,5)
Trichlorophenol(2,4,5)(Contaminant) (400.0 mg/L or more)
Trichlorophenol(2,4,6)
Trichlorophenol(2,4,6)(Contaminant) (2.0 mg/L or more)
Trichloro(1,1,2-)-1,2,2-trifluoroethane (Contaminant)(10% or more)
Triethylamine
Trinitrobenzene(1,3,5) (R,T)
Trioxane(1,3,5), 2,4,6-trimethyl- Tris(2,3-dibromopropyl) phosphate
Trypan blue
Uracil mustard
Urea, N-ethyl-N-nitroso-
Urea, N-methyl-N-nitroso-
Vanadic acid, ammonium salt *
Vanadium pentoxide *
Vanadium oxide V-2 O-5 *
Vernolate

Vinylamine, N-methyl-N-nitroso- *
Vinyl chloride (Contaminant) (0.2 mg/L or more)
Warfarin, & salts, at concentrations >0.3% *
Warfarin, & salts, when at conc. 0.3% or less
Waste, manufacturing (see 49CFR)
Wastewater treatment sludge (see 49CFR)
Xylene (I)
Xylene (10% or more)
Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxy-benzoyl)oxy]-,methyl ester(3beta, 16beta,17alpha,18beta,20alpha)-
Zinc, bis(diethylcarbamodithioato- S,S')-
Zinc, bis(dimethylcarbamodithioato-S,S')-*
Zinc cyanide *
Zinc cyanide Zn(CN)-2 *
Zinc phosphide Zn-3 P-2, at conc. > 10% (R,T) *
Zinc phosphide Zn-3 P-2, at conc. of 10% or less
Ziram *

Appendix B: Toxicity Characteristics

8 heavy metals
Arsenic
Barium
Cadmium
Chromium
Lead
Mercury
Selenium
Silver

10 pesticides
2,4-d
Endrin
Heptachlor (and its epoxide)
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Lindane
Methoxychlor
Toxaphene
2,4,5-tp (silvex)

22 organic chemicals
Benzene
Carbon tetrachloride
Chlordane
Chlorobenzene
Chloroform
O-cresol
M-cresol
P-cresol
Cresol
1,4-dichlorobenzene
1,2-dichloroethane
1,1-dichloroethylene
2,4-dinitrotoluene
Methyl ethyl ketone
Nitrobenzene
Pentrachlorophenol
Pyridine
Tetrachloroethylene
Trichloroethylene
2,4,5-trichlorophenol
2,4,6-trichlorophenol
Vinyl chloride

Appendix C: University Procedure for Disposal of Clean Labware

AdventHealth University Sciences Procedure for Disposal of Clean Labware

What is permitted?
All glass or plastic (except as stated below), broken or unbroken, which is not contaminated with chemical, radioactive, biohazardous, or other materials. Labels must be removed or defaced. Includes bottles, lab glass and plastic ware.

What is not permitted?
Red bags or anything with Biohazard symbol. Syringes or other materials that belong in "sharps containers". Tissue culture or molecular biology labware.

What is "clean"?
Rinsed, Empty containers (P-listed hazardous waste containers must be triple rinsed. Rinses from P listed material are hazardous waste). Non-contaminated glass or plastic labware.

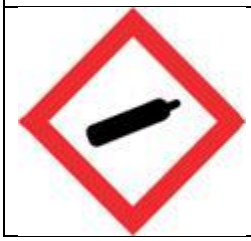
What is "empty"?
Contains no chemical residue. Contains no liquids.

How to package and dispose?
All labware must be completely empty and rinsed, any original labels should be removed or defaced, and disposed in the normal solid waste (trash).
For glassware to be thrown away it must be completely empty and rinsed, any original labels should be removed or defaced. Then place the container in a cardboard box lined with a plastic bag. On the outside of the box, write the words "Clean Glassware," and the room number. Once the clean glassware container is ready to be disposed, contact the EHS.

If you have any questions contact the Environment, Health and Safety Office.

Appendix D: Classification and Labeling of Chemicals

GHS (Globally Harmonized System) of the Classification and Labeling of Chemicals

	• Oxidizers
	• Flammables • Self Reactives • Pyrophorics • Self-Heating • Emits Flammable Gas • Organic Peroxides
	• Explosives • Self Reactives • Organic Peroxides
	• Acute toxicity (Deadly/severe)
	• Corrosives
	• Gases under Pressure

	• Carcinogen • Respiratory Sensitizer • Reproductive Toxicity • Target Organ Toxicity • Mutagenicity • Aspiration Toxicity
	• Environmental Toxicity
	• Irritant • Dermal Sensitizer • Acute toxicity (harmful) • Narcotic Effects • Respiratory Tract • Irritation

Appendix E: Satellite Accumulation Area Requirements

Hazardous Waste Satellite Accumulation Area Requirements are shown below.

- Mark all waste containers conspicuously with the words “Hazardous Waste.”
- Label all containers accurately, indicating the constituents and approximate percentage of each. The concentration of the constituents must add up to 100%. Hazardous Waste labels are not necessary on unused product as long as the original label is intact.
- Limit the satellite area waste volume to no more than 55 gallons of waste, or one quart of a “P” waste at any one time. Submit a collection request well before you exceed these volumes. Refer to the Hazardous Waste Management Manual Appendix B for assistance in identifying waste types.
- Close all containers during accumulation except when necessary to add or remove wastes. Do not overfill containers. Leave adequate headspace for expansion. Funnels must be removed from containers when not in immediate use.
- Seal all containers tightly. No open or parafilm covered containers may be used for waste accumulation.
- Ensure waste is compatible with other wastes in the container, and with the type of container it is stored in. The exterior of the container must be free of chemical contamination; leaking containers will not be picked up. Segregate containers of incompatible waste to prevent reactions. The Lab Safety Manual provides a list of incompatible chemicals (also available in Appendix F).
- Biohazardous waste and Radioactive waste must not be mixed with or stored in the same location(s) as Chemical Hazardous Waste.
- Keep containers near the process which is generating the waste; waste must be under the continuous control and supervision of its Laboratory Coordinator.
- Train all students and staff in work place of waste accumulation site requirements including emergency response.
- Emergency Response
    - Know the location of your spill kit, emergency shower, fire extinguisher, and exits.
    - Chemical Spill – minor
        - Stop the spill
        - Cover the spill.
        - Spread the word
        - Decontaminate
    - Spill – major
        - Evacuate area, isolate area to prevent entry
        - Call 911.
        - Call AHU Emergency Security immediately
    - Fire
        - Pull Fire Alarm,
        - Evacuate, Call 911
        - Call AHU Emergency Security immediately
    - Fire, Explosion, or Spill threatening life or health outside of facility
        - Call 911. Contact AHU Emergency Security immediately.

Appendix F: List of Incompatible Liquid Chemicals

All liquid chemicals must be segregated by hazard classification and stored only with compatible substances. The following categories of liquid chemicals should be segregated from other categories.

- Acids: Organic acids should be kept separate from inorganic (mineral) acids. For example, store acetic and formic acids separate from hydrochloric and sulfuric acids.
- Bases: May react violently with acids, oxidizers or flammables.
- Oxidizers: Keep away from acids, bases, organics and metals; keep cool. Examples of strong oxidizers: Perchloric acid, nitric acid.
- Flammable liquids: The excess over 10 gallons in any workspace must be stored in flammable storage cabinets or in safety containers. Keep separate from acids, bases, and oxidizers.
- Toxic or poisonous liquids: Must be segregated and stored separately, as they could be released and/or intensified with reactions with the other chemicals. Examples of this may be cyanide solutions. Other chemicals, such as formaldehyde should be stored in plastic bottles at the lowest shelve or storage space. This will minimize the potential for spillage.
- Mercury: Must be stored in non-breakable secondary containers and kept on a bottom shelf of a closed cabinet.
- Non-hazardous/inert liquids: May be stored with any other category, but it is recommended that they also be segregated for consistency.
- Accumulated chemical waste: Liquid chemical wastes must be stored by compatibility.

Appendix G: Chemical Hazardous Waste Log

State and federal law prohibits improper disposal of hazardous material. If found, contact the Environment, Health and Safety Office at (407) 303-7747 ext. 1103936

Department:	Phone #:
Laboratory Coordinator:	Building and Room Number:
Start Log Date:	Completion Date:

Description of Waste Product (E.g. compound name)	Type of Waste (F,P,A,B,O,H)	Physical State (S,L,G)	Quantity of Waste (kg)	Initials

*Physical State: Solid (S) Liquid (L), Gas (G)
*Type of Waste: Flammable (F), Poison (P), Acid (A), Base (B), Oxidizers (O), Low Hazard (H)

Signature of Lab. Coordinator: _____ Date: _____

Signature of EHS Coordinator during waste pick up: _____ Date: _____

Appendix H: Equipment Waste Log

State and federal law prohibits improper disposal of hazardous material. If found, contact the Environment, Health and Safety Office at 407-303-7747 ext. 1103936

Department:	Phone #:
Name:	Building and Room Number:

Date	Equipment Name or Description (attach picture if only a description is provided)	Insert Picture File	Type of Waste (Elec., Non-Elec., Coolant/Fridge)	Quantity	Approximate Weight (lbs)	Initials

*Type of Waste: Electronic (Elec.), Non-Electronic (Non-Elec.), Coolant/Fridge

Signature of Lab. Coordinator: _____ Date: _____

Signature of EHS Coordinator during waste pick up: _____ Date: _____