LABORATORY RELOCATION GUIDE

Prepared by: UCSB Environmental Health & Safety

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EH&S Contact Numbers:			
Chemical spills / odors	x-3293	Radiation Safety	x-7256
After-hours spill cleanup/odor	x-3194	Biosafety	x-8894
Chemical Safety	x-489	General info	x-7534
Chemical Waste Disposal	x-3293	Fire, Medical, Police	9-911

1. BEFORE YOU START

- **Look at the area you will be moving into**. Is there a 2nd exit as is often required by code? Are bio-safety cabinets and fume hoods located away from door and foot traffic? Is there an emergency shower and eyewash per code? Are electrical outlets where you need them? Have seismic restraints been installed on existing shelves? Are there chain restraints ready for large gas cylinders? Is there ventilated chemical storage?

- **Are you moving to an off-campus location?** If so, special permits will be required. Contact the EH&S Lab Safety Specialist at x4899 for assistance. Provisions will also need to be made for disposal of hazardous wastes at off-campus location(s).

- **Complete and send the EH&S notification form** (found at the back of this book) and send to Environmental Health & Safety. This will facilitate update of records maintained by EH&S for compliance with granting agencies and regulatory requirements.

2. BACK INJURY PREVENTION

- When lifting, get as close to the object as possible to prevent excess back strain.
- Twisting when reaching or lifting an object is the main cause of back injuries.
- Use a ladder or step-stool to bring high objects down below shoulder height.
- For object in front of you, support your upper body weight by leaning on desk or table
- Lift with your leg muscles, not your back.

3. CHEMICALS: DISPOSING, PACKAGING & MOVING

Packaging Chemicals: Package in separate boxes to prevent incompatibles mixing together which could result in fire, explosion or toxic release. See Sec. 7 for examples and definitions.

Bases	*Highly Toxics*	*Acids (mineral)*
Flammables	*Water Reactives*	*Oxidizers/Oxidizing Acids*

- While going through your chemicals, it's a great time to consider creating a lab chemical inventory to avoid double-ordering and to track expired chemicals.

- Use sturdy, partitioned boxes to pack chemical containers. To prevent breakage and contain spills, cushion the containers with absorbent materials such as vermiculite. For highly toxic chemicals, secondary containers should be used (i.e. plastic tub) which will completely contain a spill of the materials within.

- Special packaging precautions should be exercised in transporting odorous chemicals (i.e., mercaptans, etc.). Some containers may require sealed double-containment to prevent smelling up corridors and elevators. If the outside of a chemical container is contaminated, a wiping down with bleach will often eliminate the problem.

- Chemical storage refrigerators must be completely dry prior to moving them to prevent a trail of possibly contaminated water leaking from the refrigerator. Bleach can be used to help deodorize the surfaces of a refrigerator, wear gloves.

Moving Packaged Chemicals: If the move is on campus, use a good hand-truck, dolly or a cart with side rails. For off-campus relocation, contact EH&S at x3293 for assistance. Do not use personal vehicles to transport chemicals. Do not leave chemicals or other items in the corridors for extended periods during moving. This is a violation of the fire code.

Chemical Waste: Never dispose of any hazardous material in the trash or down the drain**.** All chemical waste must be transferred to EH&S for disposal. Requests for waste pickups may be made by filling out a *Waste Pickup Request Form* and mailing to EH&S, or submit electronically via the EH&S website: http://www.ehs.ucsb.edu/ Contact x3293 for assistance.

Organic Peroxide Formers: Organic peroxides are compounds that have unusual stability problems. They can be explosively unstable, or violently polymerize, and are sensitive to heat, friction and impact. Should not be moved to the new lab if material has exceeded its expiration date (different for opened and sealed containers). Classes of organic compounds that form peroxides during storage after air exposure include (from most to least susceptible):

1. Ethers
2. Alkenes w/ allylic hydrogen
3. Chloro, fluoro alkenes
4. Vinyl halides, esters, ethers
5. Dienes
6. Vinylalkynes w/ alpha hydrogen
7. Alkylalkynes w/ alpha hydrogen
8. Alkylarenes w/ tertiary alpha hydrogen
9. Alkanes w/ tertiary hydrogen
10. Acrylates, methacrylates

Labeling of Wastes: All chemical containers must be properly labeled or EH&S can not pick them up. Chemical names must be specific. Labels with nonspecific names such as organic waste, waste solvents, acid waste, etc., are not appropriate. Chemical formulas or abbreviated chemical names are not acceptable.

Containers: Must be leak proof. Liquids must be in a screw-capped container that will not leak if tipped over. Corks, parafilm or lab beakers that will easily tip over are not acceptable. Note, disposal recharges are based upon container volume, not the contents volume, i.e., it is not cost effective to ship 50 ml of material in a 4 L container.

Unknowns : Will be accepted by EH&S on a case by case basis. EH&S will have to perform a chemical analysis and additional charges will be levied. The generator is responsible for writing on the tag any other information about the material that is known.

Compressed Gases: Corrosive gases **should not be stored for more than six months.** Due to their reactive nature, they often corrode their valves once they are opened, which then tend to leak; particularly with lecture bottles. *Examples: boron trichloride, boron trifluoride, hydrogen sulfide, carbonyl sulfide, nitric oxide, hydrogen chloride, chlorine, fluorine, hydrogen bromide, hydrogen fluoride, sulfur tetrafluoride*

- Empty cylinders should be labeled “empty” or “MT”.
- Contact EH&S at x3293 if you have a cylinder with unknown contents.
- Make sure the valve cap is securely in place before moving any cylinder.
- Transport cylinders on a wheeled cart, carefully secured in an upright position.
- Do not leave cylinders unattended in the corridor.
- Never move a cylinder by rolling it across the floor.
- Secure large cylinders with a metal chain anchored to solid structural wall member.

Chemicals Inside of Lab Equipment: Certain laboratory equipment may contain materials or chemicals which are potentially harmful to human health or the environment:

ASBESTOS	MERCURY	PBCs	ACIDS
Autoclaves	Manometers	High voltage systems	Batteries
Ovens	Thermometers	Power supplies	Power Supplies
Furnaces	Barometers	Capacitors	Transformers
Gloves, Curtains			

Items which contain damaged asbestos should not be moved - report them to EH&S at x7984. Suspect PCB (polychlorinated biphenyl) items should also be reported to EH&S and should be clearly labeled prior to transport to the new facility.

Chemical Spills: You should not attempt to cleanup a spill yourself if:

* You feel it may be unsafe to do so.
* You do not know the identity of the spilled material.
* You do not have adequate or proper materials for cleanup.
* You feel any physical symptoms of exposure.

If you cannot clean up the spill for any of these reasons, then:

* Isolate the area. Notify others of the spill. Notify EH&S immediately (x-3194)
* Evacuate the area. Close doors and post a warning sign.

4. BIOHAZARDS: DISPOSING, PACKAGING & MOVING

Packing and Moving: Biological materials include all etiologic agents, human and animal tissues, blood, blood products, and other body fluids. Infectious materials should only be handled by people listed on the Biohazard Authorization. When transporting biological materials, achieve maximum protection by packaging in both primary and secondary containers - label with the type of material, and the name and phone number of the PI. Label with the international Biohazard symbol if appropriate. If moving off-campus, consult with EH&S Biosafety Officer (x8894) for inter/intrastate or international shipping regulations.

Biohazardous Waste Disposal: EH&S will not pick up biohazardous materials or medical waste. All biohazardous waste must be disposed of as follows:

Biosafety Level II liquid infectious waste or cell cultures in liquid media: Disinfect the liquid with 10% bleach, 70% ethanol, or iodoform solution, allow 30 minutes contact, then pour down the sink.

BSL2 contaminated solid waste (including sharps waste): Autoclave red-bagged waste using posted instructions, then place in a black garbage bag and dispose of as solid municipal waste. Place sharps in approved red plastic sharps container with the international biohazard symbol before autoclaving (available in Biology storeroom).

BSL2 infected animal carcasses or human tissue: Keep frozen, then call for pickup by licensed medical waste hauler. For information, call EH&S at x8894.

Remember that all biohazardous waste disposal bags must be labeled with:

University name	PI name	Address
Building number	Phone	Room number

Disinfecting Benches: All work surfaces must be decontaminated prior to vacating the laboratory with the disinfectant appropriate for the organism. The PI is responsible for complete decontamination and removal of hazardous materials from the vacated lab. Following complete decontamination, contact EH&S at x8894 to schedule a close-out survey.

Biological Safety Cabinets: Disinfect safety cabinet work surfaces prior to moving them to new facilities. All cabinets must be recertified for correct air flow and filter integrity after being moved. Call the Biosafety Officer at x8894 for testing contractor information.

5. RADIOACTIVES: DISPOSING, PACKAGING & MOVING

Before You Move: To avoid delays in receiving radioisotopes, contact the Radiation Safety Officer at x3588 or x7256 two weeks prior to your move to have your *Ionizing Radiation Authorization* amended to allow radioisotopes at the new location. New lab areas must be posted *before* materials are brought in.

Packaging

a) Active research materials must be placed in totally enclosed, impermeable secondary containers before being moved by lab personnel.

b) Posted and contaminated equipment must be thoroughly decontaminated and surveyed, or sealed in plastic bags, before being moved by lab personnel.

c) Radioactive waste shall only be moved by Radiation Safety Office personnel. Note: private vehicles shall not be used to move radioactive materials.

Waste Disposal: For radioactive materials not being moved, follow normal radioactive waste disposal procedures using the Radioactive Waste Pickup Request Forms. Mail the form to EH&S for pickup. Specific instructions may be found in the "UCSB Radiation Safety Manual", or by calling the Radiation Safety Office (x7256) for assistance. Do not leave radioactive materials or waste in the vacant lab.

Spills: Immediately report all spills of radioactive materials on campus to EH&S at x3588 or x7256 during office hours (8:00 am to 5:00 pm), or afterhours to the EH&S Hotline at x3194.

After You Move: The PI is responsible for complete decontamination and removal of radioactive materials from the vacated lab. The PI should not remove any radioactive materials signs from doors or designated work areas. Following complete decontamination, contact EH&S at x7256. EH&S will conduct a decommissioning

survey **only** after all radioactive materials and posted equipment have been removed. **This survey is required before anyone moves into or renovates the vacated lab space.**

6. SHARPS DISPOSAL

Any item with a cutting edge or puncture capability is considered a sharp. These include hypodermic needles, razor blades, broken glass, glass slides and cover slips, Pasteur pipettes, Mohr pipettes, etc. To avoid injury to the custodial staff and others, follow these guidelines:

Uncontaminated glass: Place into a labeled "Glass Only" trash box or other hard-sided container. Cardboard boxes specifically made for this purpose are available from scientific supply vendors, or in some campus storerooms. When full, dispose into your bldg. dumpster.

Chemical contaminated sharps: If there is greater than trace amounts of chemical contamination, or chemical is highly toxic, then treat as other chemical wastes. Label container as "Sharps contaminated with (chemical name)", then give to EH&S for disposal.

Needles, razor blades, scalpels: Label a rigid, puncture-proof container as "Sharps Waste". Tape closed or tightly lid when full. Place into dumpster, or inside glass box, as above.

Biohazard contaminated sharps: See "BSL2 contaminated solid waste" on pg 6.

Radioactive contaminated sharps: Containers should be properly labeled as "Sharps contaminated with (isotope name)". Place sealed container in a solid radioactive waste container. If sharp is also a needle, razor blade or scalpel, first pre-package as above.

7. SETTING UP THE NEW LAB

Chemical Storage Guidelines by Hazard Class

1) **Oxidizers**—materials which react violently (fire/explosion) with organics. Examples include nitrates (nitric acid), permanganates, peroxides, perchlorates (perchloric acid).
    * Keep separate from flammables and other organic materials.
    * Keep separate from reducing agents (i.e., zinc, alkaline metals, formic acid).

* Do not store directly on wooden surfaces.

2) **Acids**—materials with pH < 5. Examples include acetic, hydrochloric, and hydrofluoric.
   * Separate from materials which evolve toxic vapors on contact (i.e., NaCN).
   * Separate from active metals (i.e., sodium, potassium).
   * Store perchloric and nitric acid as oxidizers not with other acids.

3) **Bases—**materials with pH > 9. Includes NaOH, $Ca(OH)_2$, $(NH_4)OH$
   * Separate from acids.
   * Store large containers below eye level.

4) **Poisons (highly toxics)—**dangerous if inhaled, swallowed or absorbed through the skin.
   * Store according to label directions in tightly sealed containers.
   * Separate from other hazard classes.
   * Store in a ventilated gas cabinet if available, particularly with toxic gases.

5) **Flammable/Combustibles**— Includes alcohols, esters, ketones, ethers and pyrophorics.
   * Store in approved flammable storage cabinet (required if > 10 gal in lab)
   * Keep away from heat, sun, flame, and spark sources.
   * Separate from oxidizers.
   * Use only approved "flammable storage", or "spark-proof" refrigerators

6) **Water Reactives**—react with water to yield flammable or toxic gases. Examples include sodium, potassium and metal hydrides.
   * Keep away from water sources—do not store above or below sinks.

New Area Checklist

- Emergency eye wash and shower working and accessible within 100 feet of your lab? Be sure the water runs clear out of these devices and access to them are not blocked.

- If needed, contact EH&S to update: "Biohazard Use Authorization" (x8894), "Ionizing Radiation Authorization"(x3588) and emergency notification door placard (x8243).

- Hazardous work areas, doors, and equipment posted for radiation, biohazards, carcinogens, lasers, and UV light? Contact EH&S for signs.

- Fire extinguishers accessible within the lab?

- Are incompatible chemicals segregated by reactivity class, per pg. 6.?

- For highly toxic or reactive (i.e. oxidizers) chemicals, secondary containment of chemical containers in polyethylene trays is recommended for spill protection.

- Chemical storage shelves have seismic lips or guards?

- Store large containers and heavy objects close to the floor, or secure from falling.
- Shelves/cabinets secured to wall? Gas cylinders secured to wall with metal chain?

- Fume hoods appear to be pulling air? Certified by EH&S within last year?

- Sharps container for broken glass and needles available and labeled?

- Is there a minimum of 28" clearance in the aisles?

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8. LABORATORY RELOCATION NOTIFICATION FORM

Please complete, detach and return this form to EH&S two weeks prior to moving to new lab facilities. Completion will allow update of records required by granting and regulatory agencies and will permit uninterrupted use of materials such as radioactive isotopes.

Principal Investigator: _____Ext:_____

Old Lab Location: Building _____ Room(s) _____

New Lab Location: Building _____ Room(s) _____
New Extension (if known): _____
Date of Move: _____

Do you use: Radioactives? _____ Biohazards? _____Chemicals?_____

Return to: Environmental Health & Safety
Attention: Dave Vandenberg