Clemson University

Date of last revision: September 2009
Lab Close-out Policy

This policy applies to all Clemson University laboratories, darkrooms, storage rooms/buildings, or any area where hazardous materials are stored or used.

The Lab Check-Out Form (Appendix E) must be filled out and signed by appropriate personnel.

A. Close Out Procedures for Hazardous Materials in Laboratories

1. Chemicals
   a. General
   b. Controlled Substances
   c. Compressed Gas Cylinders

2. Biological Materials

3. Radioactive Materials
   a. General
   b. Radiation Producing Devices

B. Laboratory Equipment

C. Laboratory Supplies

D. Shared Areas

Appendix A: Contact Information/Telephone numbers
Appendix B: Transporting Research Chemicals
Appendix C: Transporting Biological Materials
Appendix D: Hazardous Waste Removal Request Form
Appendix E: Lab Close Out Form
**Chemicals**

**General**

All chemicals must be disposed according to the CU Hazardous Waste Management Manual which can be found on the EHS website: http://ehs.clemson.edu

Check refrigerators, freezers, chemical hoods and bench tops as well as storage cabinets for chemical containers.

Determine which chemicals are usable and relocate/transfer responsibility for these materials to another researcher who is willing to take responsibility for them. If chemicals will be moved to another laboratory, ensure that the EH&S policy "Movement of Laboratory Owned Research Chemicals" is followed. This policy is attached in Appendix B.

If a new user cannot be found, the materials must be disposed of properly through EH&S Hazardous Materials Management.

Assure that all waste containers of chemicals are labeled with the name of the chemical(s). Hazardous waste labels are available through EH&S and can be found on the EHS website.

- Abbreviations or chemical symbols are not acceptable labeling.
- All containers must be securely sealed and not leaking.
- All containers (beakers, flasks, etc.) must be emptied (contents must be properly disposed) and cleaned.

Hazardous chemical wastes must be clearly labeled and collected for disposal. Submit a "Chemical Waste Pick Up Request" form (Appendix D) to June Brock-Carroll at juneb@CLEMSON.EDU or fax to 864.656.7630.

**Controlled Substances**

Transferring ownership of a controlled substance to another licensed individual must be recorded in writing. If controlled substances are relocated, DEA must be notified in writing of new location.

If a controlled substance(s) is distributed to another person, their name, address and DEA registration number must be recorded in the substance(s) continuing record, along with date and number of units distributed. Records must be maintained.

Contact EH&S Hazardous Materials Management to obtain information on proper disposal methods. The DEA must be notified prior to disposal.

If a controlled substance(s) is disposed of, include date, manner of disposal, and quantity of substance disposed. Keep all disposal records.
Compressed Gas Cylinders

Remove gas connections, replace cylinder caps, and return cylinders to suppliers. Any compressed gas cylinder being moved must be secured on an appropriate cylinder cart. Small lecture bottles must be properly packed as bottles.

Compressed gas cylinders should be transported from floor to floor on freight only elevators with no occupants. Cylinders should always be leak tested before being placed onto the elevator.

If a passenger elevator must be used, the elevator must be posted “transporting compressed gases—"NO passengers”. Assure that the cylinder is properly secured to a stable cylinder cart before placing it onto the elevator.

Someone must be waiting at the designated floor to remove the cylinder from the elevator. If there are floors between the floor where the cylinder is placed onto the elevator and the floor where it will be retrieved, personnel should be staged at the elevator on those floors to ensure that no one gets onto the elevator until the cylinder has been removed.

If cylinders are non-returnable, consult EH&S Hazardous Materials Management for disposal.
Biological Materials

All biological materials must be transferred to an investigator listed on the protocol for safe keeping or disposed of properly. The following is a guideline of the disposal determination and procedure:

Bio-hazardous waste is defined in SCDHEC “Infectious Waste Management Regulations R. 61-105”. Copies and other information on this subject are available in the office of Environmental Health and Safety, Moorman House, 208 N. Palmetto Blvd., Clemson University, Clemson SC 29631-3012. 864.656.2583 Fax # 864.656.7630

Here are some simple instructions and generalizations derived from this regulation and our local landfill restrictions.

- All small animal tissues are bio-hazardous waste and should be declared to Environmental Health and Safety for removal. Large animal tissue disposal is also regulated by SCDHEC and you should call us for instructions on these items.

- All animal tissues fixed in Ward Safe, Caro Safe and any other non-hazardous fixative should be considered bio-hazardous waste with all free liquids removed and the solids properly packaged in proper shipping containers supplied by Environmental Health & Safety. The liquids should be declared as a Non-RCRA Regulated Waste to Environmental Health and Safety. This also includes animal tissues fixed in formaldehyde.

- All Human Blood and tissue, animal blood and bedding potentially contaminated with a zoonotic microbe and any wastes from recombinant DNA experiments are bio-hazardous waste and should be declared to Environmental Health and Safety for removal.

- All non-controlled pharmaceuticals, vaccines, & enzymes are bio-hazardous waste and should be declared to Environmental Health and Safety for removal.

- All filters and apparatus that have been used to filter or contain Human blood and tissue, recombinant DNA or zoonotic microbes are bio-hazardous waste unless properly deactivated as described in R.61-105 and should be declared to Environmental Health and Safety for removal.

- All items determined by protocol review from the University Bio-Safety Committee or the department of Environmental Health and Safety to be bio-hazardous are such and will be managed as bio-hazardous wastes.

- All needles, scalpels and any other sharp items that could be defined as “Medical Waste’ should be placed in an appropriate sharps container obtained from Environmental Health and Safety.

- No waste should be stored for more than 96 hours with out refrigeration or no more than 30 days under proper refrigeration conditions described in R. 61-105 as below 42 degrees Fahrenheit.

The Biological Waste pick up request form for declaring waste can be found at this address: http://ehs.clemson.edu/biosafety/biohazar.html.
Radioactive Materials

General

Radioactive materials are possessed and used by University personnel within under the authority of a radioactive materials license, issued by the state of South Carolina DHEC (department of health and environmental health and control) through its’ Bureau of Radiological Health. This license restricts possession and use of radioactive materials to qualified personnel (Authorized Users) at discrete locations (authorized places of use), which are approved by the University’s Radiation Safety Committee and the Radiation Safety Officer.

If, for any reason, radioactive materials are removed from the authorized place of use, or if the authorized user should separate from the University, certain steps shall be taken in order to return the previously authorized use area to an unrestricted area, free of radioactive materials or radioactive contamination. Prior to close out of a radioactive materials area the following steps must be taken.

1. Notify the EH&S Radiation Safety Office as soon as the intent to vacate is known, preferably thirty days in advance.

2. Make arrangements with Radiation Safety to remove all radioactive materials including waste from the laboratory.

3. Survey the laboratory and decontaminate any contaminated areas as necessary. Coordinate any decontamination efforts with the radiation safety office.

    NOTE: Areas of potential residual contamination may include refrigerators and freezers, centrifuges, water baths, hoods, sinks, floor areas under waste containers, etc.

4. Do not remove any of the signs, stickers, or postings. Contact Radiation Safety at 864.656.7165 or ajess@clemson.edu to schedule a final closeout survey.

If the laboratory is being vacated because the researcher is leaving the University, the following additional steps must be followed:

1. Usage records, including Survey Records, must be updated, finalized and submitted to Radiation Safety.

2. Waste disposal records must also be finalized and turned in.

3. All radioactive material waste containers must be removed/picked up by Radiation Safety.

4. Personnel dosimeters must be returned to Radiation Safety.

5. Termination bioassays must be performed if applicable.

For questions or assistance please call Radiation Safety at 864.656.7165.

Radioactive materials, contaminated equipment, or equipment that is capable of producing ionizing radiation may be transferred to another facility, which is licensed to possess such materials, by the U.S Nuclear Regulatory Commission or by another agreement state. The transfer of licensed materials shall be under the direction of the RSO. Prior to shipment/transfer of the material, the RSO shall have a current copy of the radioactive materials license that
authorizes the Institution, facility, or individual who will be in receipt of any licensed material prior to shipment from the university.

**Radiation Producing Devices**

Possession and use of equipment capable of producing ionizing radiation (x-rays), is also controlled by the South Carolina DHEC. If such equipment is taken out of service for repair, replacement, or for disposal, the RSO must be notified. The RSO must be notified prior to removal of x-ray equipment from a laboratory or other authorized place of use.

It is unlawful to operate equipment capable of producing ionizing radiation unless the machine is registered with the Bureau of Radiological Health and the individual who operates such equipment has been approved by the Bureau. The RSO will notify the Bureau of Radiological Health if an x-ray producing device is taken out of service or if the authorized place of use is to be moved. X-ray machines that are permanently taken out of service or disposed shall have the x-ray tube removed by the RSO so that the device is incapable of producing ionizing radiation in the future.

**Lasers**

Class 3b and class 4 lasers are to be used in areas approved by the RSO and operated by personnel who have received training specific to operation of the laser in question. As is the case with x-ray devices, the approved laser user shall notify the RSO of his/her intent to move a laser use area or remove a laser from a laboratory prior to doing so - preferably thirty days in advance.
Laboratory Equipment

All equipment must be disinfected and decontaminated by lab staff and certified as clean and safe for handling. This will include, but not be limited to, all chemical hoods, refrigerators, freezers, centrifuges, biological safety cabinets, incubators, ovens, countertops, cabinets etc.

Biological safety cabinets must be decontaminated prior to being relocated. Please contact the Biological Safety Officer for information.

Equipment that will not become the responsibility of another faculty member or the department must be taken to surplus or properly disposed as necessary (contact EHS if you are not certain of the appropriate action)
Laboratory Supplies

Glassware, if non-contaminated, should be collected in sturdy, puncture-resistant containers; all glassware must be empty and all labels must be removed or obliterated; containers must not be overfilled—no glass should ever be protruding from the container. Dispose when glassware is within a few inches of the top or when the weight of the container reaches a safe maximum weight for lifting based the person(s) who will be carrying it to the dumpster. DO NOT place glassware in laboratory receptacles used for collection of general waste (i.e. paper, plastic).

If glassware/container has held acutely toxic chemicals, it must be triple-rinsed and the rinsate disposed as hazardous waste; container may then be disposed with general glassware.

Containers with "biohazard" or biohazard symbols may not be used for disposal of general glassware.

Keep the bottom of the box dry (check before lifting to ensure that the container will remain intact when lifted).

Seal/tape the box securely and dispose in dumpster.

All needles, vacutainers, scalpels etc., must be placed into sharps boxes for disposal through EHS.

DO NOT place glass or sharps (syringes, scalpels, etc) into regular trash.

Usable, non-contaminated laboratory supplies may be transferred to other researchers.

Contaminated glassware and lab equipment that cannot be decontaminated must be disposed as hazardous waste.
Shared Areas

All chemicals, biological agents, radioactive materials, equipment, etc. used in common/shared areas must be properly disposed/removed unless other faculty member(s) agree (in writing) to assume responsibility for the materials.

These shared spaces will include labs, equipment rooms, storage areas, cold rooms, dark rooms, autoclave rooms, shared laboratories, etc.
## Appendix A—Contact Information

<table>
<thead>
<tr>
<th>Role</th>
<th>Phone Numbers</th>
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<tbody>
<tr>
<td>Environmental Health and Safety</td>
<td>864.656.2583</td>
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<tr>
<td>Biological Safety Officer</td>
<td>864.656.1806</td>
</tr>
<tr>
<td>Chemical/Lab Safety</td>
<td>864.656.7554</td>
</tr>
<tr>
<td>Hazardous Waste Manager</td>
<td>864.656.1770; 864.656.7309</td>
</tr>
<tr>
<td>Radiation Safety Officer</td>
<td>864.656.7165</td>
</tr>
<tr>
<td>Fax</td>
<td>864.656.7630</td>
</tr>
<tr>
<td>EHS website</td>
<td><a href="http://ehs.clemson.edu/">http://ehs.clemson.edu/</a></td>
</tr>
</tbody>
</table>
Appendix B—Transporting Research Chemicals

Policy: Movement of Laboratory Research Chemicals (within CU Campus)

Purpose: To ensure the safe handling and movement of research chemicals from lab to lab and building to building. This does not affect the movement of new chemicals being delivered.

Departmental faculty/staff may move chemical bottles from one laboratory to another laboratory if the following conditions are met:

*Please note that specific regulations (e.g. DOT, OSHA BBP, CDC, IATA) must be observed when shipping or transporting hazardous materials outside of core campus.

Staff who will be doing the moving of the bottles must be trained in the proper handling of chemicals.

Containers must be in good condition and must be properly closed/sealed.

Chemical bottles or containers are adequately labeled (full chemical name and associated hazard(s)).

It is preferable to use crates or sturdy poly-type containers. If boxes are used to move chemicals, ensure that they are in good condition and are sturdy enough to handle weight of the bottles of chemicals.

Crates, boxes, etc. should not be excessively large to prohibit overloading or safe handling.

Bottles of chemicals are segregated and packed into boxes by hazard class. Non-compatible chemicals may not be packed or moved in the same box (call EH&S for further information).

Glass bottles and all bottles containing liquids will be packed in boxes with a buffer of vermiculite or other similar absorbent material.

Plastic or unbreakable bottles of powdered or non-liquid chemicals may be packed with compatible chemicals, without absorbent material.

Each box of chemicals will be inventoried for contents as it is being packed. Required information will include chemical name, number of bottles and quantity in each.

Boxes must be labeled distinctly with a corresponding inventory page.

Copies of the inventory must be kept in each box, with the moving crew and in the originating lab.

Carts used to move boxes must be sturdy enough to handle weight of the boxes and terrain it will be moved over.

Adequate spill control material must be available for use by the moving crew. If the boxes are being moved between buildings, the spill control material must be available on the vehicle in use.
Adequate personal protective equipment (PPE) must be available for the moving crew in the event of a spill. Staff must be trained in the proper method of use of the PPE.

An updated chemical inventory for the originating lab (showing the removal of the chemicals) and the receiving lab (showing the receipt of the chemicals) must be completed and kept on file in each of the respective labs and mailed to EHS.

Material safety data sheets for each hazardous chemical must accompany the chemical. Appropriate personal protective equipment (safety glasses, clean gloves, lab coat, etc.) as required must be worn when transporting chemicals.

Chemicals should be moved only from point A to point B—no stops in between (offices, restroom, etc.)

Chemicals must always be under the control of the responsible person(s); never chemicals unattended in corridors or other areas outside the lab.

Chemicals may not be transported in personal vehicles.
Appendix C—Transporting Biological Materials

Biological Materials Transport Policy (within the CU campus)

This policy is to prevent accidents and to ensure that CU personnel are not exposed to biological materials during their transport. It is intended to ensure compliance with local, state, and federal guidelines and regulations concerning the transport of biological materials.

Please note that specific regulations (e.g. DOT, OSHA BBP, CDC, IATA) must be observed when shipping or transporting materials outside of campus. For those instructions, please see the chapter on the packaging and shipment of biological materials in the UF Biosafety Manual.

General requirements for transport of biological materials within the CU campus:

- Personnel transporting biological materials shall be appropriately trained. This includes Bloodborne Pathogen training for persons transporting human blood, and training specific to any individual pathogen being moved.

- Proper personal protective equipment shall be worn. At a minimum, a lab coat and gloves are required. Goggles shall be worn while packaging and unpacking infectious material.

- Biological materials shall be placed inside an appropriate leak-proof primary container with a tight-fitting lid. These containers should be plastic, glass, or metal.

- Primary containers shall be placed within a leak-proof, shatter-resistant secondary container.

- The surface of the secondary container shall be easily cleaned. It shall be labeled with the biohazard label if infectious materials are being moved. Rubbermaid or similar brand coolers or plastic boxes with tight-fitting lids may be used.

- Primary containers shall be placed upright in the secondary container. Tube racks or other means shall be used to assist with this.

- All packages containing infectious substances must be labeled with the contents and a name and phone number of the responsible party.

- Biological materials shall be transported from laboratory to laboratory without any stops in public areas such as offices, cafeterias, or restrooms.

- The receiver of transported biological materials shall be prepared to receive the materials. At a minimum, wear a lab coat, gloves, and safety goggles. The receiver shall have a plan to deal with damaged or broken primary containers.

- Forceps, a sharps container, and an appropriate disinfectant shall be available for decontamination and disposal of broken glass or plastic materials.
Appendix D—Hazardous Waste Removal Request Form

FAX TO: Philip D. Carroll Jr. (cphilip@clemson.edu) or June Brock (juneb@clemson.edu)

Environmental Health and Safety
208 Moorman House, Clemson SC 29631
Phone: 864.656.1770, Fax: 864.656.7630

THROUGH: _________________________________________________________
            (Agency Head, print)                          (Signature)                         (Department)

FROM: _____________________________________________________________
       (Print name) (Signature)                                      (Date)                        (Phone #)

In signing I (the Generator) am agreeing that the waste materials listed below have been
properly labeled and stored in: Room # ______ and building ____________ and these items
qualify as hazardous waste according to EPA and Clemson University guidelines as referenced
in the University's HAZARDOUS WASTE MANAGEMENT MANUAL (found at http://
eh.s.clemson.edu). These items have been screened into the hazard type group check marked
below and properly segregated to ensure safe temporary storage.

Each hazard characteristic grouping of waste is presented on a separate Hazardous Waste
Removal Request Form.

(Check ONE only. Use a separate request form for each different hazard class.)

___ Waste Flammable (Include Flammable Corrosives and Flammable Poisons)  ____Waste
Poison

___ Waste Corrosive (Include Corrosive Poisons)  ____Waste Reactive (Include Oxidizers,
Ethers, & Peroxides)

<table>
<thead>
<tr>
<th>Chemical Name and/or Mixture Constituents by %</th>
<th>Waste Volume</th>
<th>Container</th>
<th>Container</th>
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<tbody>
<tr>
<td></td>
<td>Liquid measure or weight</td>
<td>Type (i.e. Glass, Metal)</td>
<td>Size (ml., L. gallons)</td>
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(This form can be found on our website  http://ehs.clemson.edu )
Appendix E—Lab Close-out Form

CU Environmental Health and Safety
Laboratory Close-out Checklist

Building: ___________________________ Room: _____________________________
Department: _________________________

Responsible Researcher(s):

_______________________________________________________________________

Contacts: __________________________ Phone/email: ____________________________

Lab is relocating: Yes     No
If so, to: Building_______________Room Number __________________

Lab has been re-assigned at this time:    Yes       No

Lab ownership is being transferred to: _____________________________________________
Phone number: __________________________

<table>
<thead>
<tr>
<th>Chemical Safety</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
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<tbody>
<tr>
<td>Chemical hoods have been cleared of all chemicals and equipment?</td>
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<tr>
<td>Chemical hoods have been cleaned/decontaminated?</td>
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<tr>
<td>Was perchloric acid used in any hood/exhaust device in this lab?</td>
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<tr>
<td>All signs (hazard, caution, etc) removed where appropriate?</td>
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<tr>
<td>All chemicals and controlled substances have been removed or disposed according to CU policy?</td>
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<tr>
<td>Gas cylinders have been removed according to CU policy?</td>
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<tr>
<td>Shelves and cabinets have been cleared and cleaned/decontaminated?</td>
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<td>Countertops have been cleaned/decontaminated?</td>
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<tr>
<td>Remaining equipment has been properly cleaned/decontaminated?</td>
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<td>Refrigerators and freezers cleaned/decontaminated?</td>
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<tr>
<td>Emergency contact and hazard information changed on lab door(s)?</td>
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</table>

Chemical/Lab Safety Representative:

Date: __________________________

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<thead>
<tr>
<th>Biological Safety</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
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<tbody>
<tr>
<td>Inside of the BSC has been properly decontaminated?</td>
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<tr>
<td>Incubators/water baths have been properly decontaminated?</td>
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</tbody>
</table>
Biohazard areas have all been properly decontaminated?
All biological waste has been removed/properly disposed?
All biological materials have been properly disposed or transferred?
All biohazard stickers have been removed?

<table>
<thead>
<tr>
<th>Biological Safety Representative:</th>
<th></th>
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<tbody>
<tr>
<td>Date:</td>
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</tbody>
</table>

*This is a two-page form; signatures on following page must be included*
Radioactive Materials
All Radioactive materials have been properly removed as directed by the University Radiation Safety Officer? _________Yes _________No

All equipment, glassware, lab benches, etc. have been properly decontaminated? _____Yes _____No

Lab has been cleared of all Radiation Safety issues by (University RSO): __________________________
Date: _______________________

Department Chair (signature): _____________________________________________________________
Date: _______________________

Faculty/Researcher (signature): ________________________________
Date: _______________________

Student (signature): _________________________________________
Date: _______________________

Comments:
_________________________________________________________________________________
_________________________________________________________________________________
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_________________________________________________________________________________

Retain a copy of this form in your departmental files and send a copy to Naomi Kelly (EHS, Moorman House).