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Chemical Hygiene Plan

Prepared by:
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EMERGENCY TELEPHONE NUMBERS

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|---|-------------------------|
| UNCP Main Campus Emergency (Fire, Off-Campus Police, Rescue, EMS) | 911 |
| UNCP Campus Police | 521-6235 |
| Office of Environmental Health and Safety | 521-6792 or 775-4772 |
| Student Health Services | 521-6219 |
| Facilities Services | 521-6233 |
| Campus Emergency Information Hotline (Adverse Weather Delays or cancellations) | 521-6888 |
| North Carolina Poison Control Center | 1-800-222-1222 |

Access EH&S Information

| | |
|--|---|
| Office of Environmental Health and Safety (EH&S) | Walter J. Pinchbeck Maintenance Building, Room 138 128A Facilities Drive Pembroke, NC 28372 |
| EH&S Webpage | https://www.uncp.edu/resources/finance-and-administration/departments/environmental-health-safety |
| EH&S E-mail | safety@uncp.edu |
| EH&S Phone | 910-521-6792 or 910-775-4772 |

Table of Contents

| | |
|---|---|
| 1.0 Introduction | |
| 1.1 Scope..... | 4 |
| 1.2 Application..... | 4 |
| 2.0 Responsibilities | |
| 2.1 UNCP Chancellor, Vice Chancellors, Provost, Deans and Department Heads..... | 5 |
| 2.2 Laboratory Safety Committee | 5 |
| 2.3 Environmental Health and Safety | 5 |
| 2.4 Principal Investigators, Lab Supervisors | 6 |
| 2.5 Laboratory Users | 7 |
| 3.0 Training | |
| 3.1 Chemical Hygiene Training | 8 |
| 3.1.1 Availability | 8 |
| 3.1.2 Content | 8 |
| 3.1.3 Information | 9 |
| 3.2 Laboratory Specific Training | 9 |

| | |
|--|----|
| 4.0 Standard Operating Procedures | |
| 4.1 Personal Protection | 9 |
| 4.1.1 Eye Protection | 10 |
| 4.1.2 Protective Clothing | 10 |
| 4.1.3 Respiratory Protection | 10 |
| 4.1.4 Gloves | 10 |
| 4.1.5 Personal Hygiene | 11 |
| 4.2 Laboratory Practice | 11 |
| 4.2.1 Transporting Chemicals | 11 |
| 4.2.2 Shipping Hazardous Materials | 12 |
| 4.2.3 Chemical Labeling | 12 |
| 4.2.4 Chemical Purchase | 12 |
| 4.2.5 Chemical Storage | 13 |
| 4.2.6 Housekeeping | 14 |
| 4.2.7 Compressed Gas Cylinders | 14 |
| 4.3 Personal Safety | 14 |
| 4.3.1 Laboratory Access | 14 |
| 4.3.2 University Property | 15 |
| 4.3.3 Horseplay | 15 |
| 4.3.4 After-Hours Work | 15 |
| 4.3.5 Working Alone | 15 |
| 4.3.6 Unattended Operations | 15 |
| 4.3.7 Hazardous Materials Security Awareness | 16 |
| 4.3.8 Eyewash Stations | 16 |
| 4.3.9 Safety Showers | 17 |
| 4.3.10 Fire Extinguishers | 17 |
| 4.4 Laboratory Controls | 17 |
| 4.4.1 Ventilation | 17 |
| 4.4.2 Chemical Fume Hoods | 18 |
| 4.4.3 Specialized Hoods | 18 |
| 4.4.4 Other Laboratory Control Equipment | 19 |
| 5.0 Chemical Waste Management | |
| 5.1 Training | 19 |
| 5.2 Chemical Waste for Disposal | 19 |
| 5.2.1 Containers | 19 |
| 5.2.2 Collection | 19 |
| 5.2.3 Container Labels | 20 |
| 5.2.4 Pick-up Process | 20 |
| 5.2.5 Drain Disposal | 21 |
| 5.3 Sharps, Glass and Plastic | 21 |
| 5.3.1 Sharps | 21 |
| 5.3.2 Broken Glass | 21 |
| 5.3.3 Plastic | 21 |
| 5.4 Spills | 21 |
| 5.4.1 Chemicals | 21 |

| | |
|---|----|
| 6.0 Medical Consultation | |
| 6.1 Reporting | 22 |
| 6.2 Availability | 22 |
| 6.3 Options | 22 |
| 6.4 Information | 23 |
| 6.5 Follow-up | 23 |
| Appendix A – Lab Safety Guidelines | 24 |
| Appendix B – Lab Safety Briefing Sign-In Roster | 25 |

1.0 INTRODUCTION

1.1 Scope:

The University of North Carolina at Pembroke (UNCP) is dedicated to protecting the health and safety of its laboratory users through compliance with applicable Local, State and Federal regulations. The Occupational Safety and Health Administration (OSHA) promulgated [29 CFR 1910.1450](#), Occupational Exposure to Hazardous Chemicals in Laboratories, on January 31, 1990 to provide guidelines for the safe use of chemicals in laboratories.

1.2 Application:

This standard applies in locations where "laboratory use" of hazardous chemicals is occurring. Laboratory use of hazardous chemicals means handling or use of chemicals in which any of the following conditions are met:

- Handling or use of chemicals occurs on a "laboratory scale" (work involves containers which can easily and safely be manipulated by one person);
- Hazardous chemical(s) or chemical procedures are used;
- Procedures are not part of a production process or process simulation; and protective laboratory practices and equipment are available and in common use to minimize the potential for employee exposures to hazardous chemicals.

Note: This standard does not apply where the use of hazardous chemicals provides no potential for employee exposure, such as in procedures using chemically impregnated test media and commercially prepared test kits.

The Chemical Hygiene Plan (CHP) is intended to provide the necessary framework for compliance with the OSHA Lab Standard. The OSHA Lab Standard applies only to employees but all UNCP lab users must comply with the requirements of the Chemical Hygiene Plan, regardless of employee status.

University policy requires supervisors to share its content and promote compliance with the standard operating procedures.

2.0 RESPONSIBILITIES

2.1 UNCP Chancellor, Vice Chancellors, Provost, Deans and Department Heads

- 2.1.1 Establish laboratory safety as an institutional priority.
- 2.1.2 Provide adequate financial and political support for chemical hygiene at UNCP.
- 2.1.3 Include laboratory safety, chemical storage and disposal considerations in long-range facilities planning and budgeting.

2.2 Laboratory Safety Committee

- 2.2.1 Prepare, implement, and maintain a written Chemical Hygiene Plan, setting forth general procedures, control measures, and information intended to assist Principle Investigators and Lab Supervisors in protecting employees from harm arising from chemical exposure.
- 2.2.2 Review the Chemical Hygiene Plan every 3 years.
- 2.2.3 Support Environmental Health and Safety implementation of laboratory safety policies, rules, and regulations.
- 2.2.4 Promote the safe use of laboratory facilities at UNCP.

2.3 Environmental Health and Safety (EH&S)

- 2.3.1 Appoint a Chemical Hygiene Officer (CHO) who is qualified by training to provide technical guidance.
- 2.3.2 Review the Chemical Hygiene Plan annually.
- 2.3.3 Provide employees with initial chemical hygiene training as scheduled and upon request.
- 2.3.4 Assist lab users in locating and obtaining SDSs upon request.
- 2.3.5 Maintain a master chemical inventory in conjunction with principal investigator and laboratory supervisors.
- 2.3.6 Maintain an emergency contact list in conjunction with HR.
- 2.3.7 Confirm that an evaluation of the performance of chemical fume hoods has been completed at least annually. Facilities Business Services Coordinator will schedule the inspections with a qualified vendor.
- 2.3.8 Coordinate required medical surveillance, treatment and exposure related recordkeeping through HR.
- 2.3.9 Perform annual and follow-up laboratory inspections and submit detailed report of identified deficiencies to principle investigators.

2.4 Principal Investigators or Lab Supervisors (Current UNCP Faculty and Staff)

- 2.4.1 Maintain a current copy of the UNCP Chemical Hygiene Plan and ensure that laboratory personnel comply with the content of the Plan.
- 2.4.2 Maintain appropriate standard operating procedures/laboratory safety plans to supplement this Plan and forward to EH&S.
- 2.4.3 Train and/or arrange for training of laboratory workers, including students and visitors, at the time of initial employment and each time new procedures or hazards are introduced in accordance with section 3.2.
- 2.4.4 Maintain records of training within the department and make available to EH&S during annual inspections.
- 2.4.5 Implement and enforce the use of safety procedures including appropriate lab attire, necessary personal protective equipment, engineering controls or work practices.
- 2.4.6 Assure that the areas where hazardous chemicals are used or stored are secured when not in use. Lab doors are closed and locked when not occupied.
- 2.4.7 Assure that all chemical containers are properly labeled and stored by compatibility.
- 2.4.8 Correct identified deficiencies on lab inspection report and submit a written action plan including completion date to EH&S by the indicated due date.
- 2.4.9 Maintain current chemical inventory on required format and forward to EH&S upon request.
- 2.4.10 Ensure availability of written emergency evacuation plan in the lab. Evacuation plan must be communicated to all lab personnel.
- 2.4.11 Assure that interim (weekly, semester, and annual) inspections are conducted using the lab self-inspection worksheets available on the EH&S lab safety web site.
- 2.4.12 Maintain employee exposure to hazardous chemicals below permissible exposure limits set forth in [OSHA 29 CFR 1910.subpart Z](#).
- 2.4.13 Arrange for EH&S to conduct appropriate air monitoring when required by a chemical specific standard or when exposure is anticipated or suspected and notify affected lab users of results in a timely manner.
- 2.4.14 Arrange for appropriate routine medical surveillance as required by OSHA regulations for specific hazardous chemicals through EH&S.
- 2.4.15 Initiate EH&S medical surveillance review and follow-up of all exposure incidents.
- 2.4.16 Maintain records of employee exposure determinations and lab related exposure incidents. Forward copies to EH&S.

2.4.17 Provide necessary personal protective clothing and equipment (at no charge to employees) Note: Respirator use must comply with requirements of the Respiratory Protection Standard and users must be included in the UNCP Respiratory Protection Program. Contact EH&S before purchasing or issuing respiratory protection.

2.4.18 Assure that engineering controls are functioning properly and arrange for maintenance if required.

2.4.19 When carcinogens, reproductive toxins, or acutely toxic chemicals are used in the lab, identify "designated use areas" in the lab safety plan.

2.4.20 Ensure the availability of Safety Data Sheets and relevant reference materials for each chemical used or stored in the lab.

2.4.21 Collect, store and dispose of chemical waste properly through the UNCP hazardous waste disposal system.

2.4.22 Include chemical hygiene and laboratory safety compliance in employee annual work plans for performance review.

2.5 Laboratory Users

2.5.1 Read and follow the guidelines in the Chemical Hygiene Plan and standard operating procedures/lab safety plans.

2.5.2 Participate in initial training and retain records for one semester.

2.5.3 Follow all safety procedures including appropriate lab attire, necessary personal protective equipment and engineering controls and work practices.

2.5.4 Do not remove or deface labels on incoming chemical containers.

2.5.5 Immediately label all secondary containers per 4.2.3.3.

2.5.6 Report all exposure incidents or hazardous conditions to your Lab Supervisor.

2.5.7 Use provided/online materials to become familiar with the hazards associated with the chemicals and procedures used in your lab (lab safety plans, SDS, lab safety resource index, etc.).

2.5.8 Use prudent practices and prescribed hazard control measures.

2.5.9 Request information or training when unsure about how to handle a hazardous chemical or procedure.

2.5.10 Immediately inform your Lab Supervisor of any potential hazard, accident or near miss.

2.5.11 Perform only authorized work, preparations and experiments in the laboratory.

2.5.12 Working in the lab under the influence of alcohol or drugs, including certain prescription and over-the-counter pharmaceuticals that may impair motor function and/or judgment, constitutes a safety hazard and is strictly prohibited.

3.0 TRAINING

3.1 Chemical Hygiene Training

3.1.1 Availability

3.1.1.1 EH&S staff coordinates Chemical Hygiene and Lab Safety Training to all laboratory employees via the UNCP Learning Management System (via BraveWeb).

3.1.1.2 Additional training sessions can be scheduled for groups upon request. To request training, send an email to safety@uncp.edu.

3.1.1.3 All laboratory employees should review the Chemical Hygiene Plan every three years after review/revision of the Chemical Hygiene Plan.

3.1.2 Content

3.1.2.1 Methods and observations that may be used to detect the presence or release of a hazardous chemical.

3.1.2.2 Permissible exposure limits and exposure guidelines.

3.1.2.3 Physical and health hazards of chemicals.

3.1.2.4 Measures employees can take to protect themselves from these hazards.

3.1.2.5 The content of the Chemical Hygiene Plan, its location and availability.

3.1.2.6 Signs and symptoms associated with exposure to hazardous chemicals.

3.1.3 Information

3.1.3.1 The Occupational Exposure to Hazardous Chemicals in Laboratories standard ([29 CFR 1910.1450](#)).3.1.3.2 Safety Data Sheets (SDS) detailing chemical or mixture specific physical and hazard assessment information are available on the SDS web page.

3.1.3.3 How to Read a SDS – Online training on how to read an SDS is available on the UNCP Learning Management System (via BraveWeb).

3.2 Laboratory Specific Training. Each laboratory supervisor will provide lab specific training. Training will include:

- 3.2.1 Location of emergency equipment such as eyewash stations, fire extinguishers, fire pull stations, safety showers, etc.
- 3.2.2 How to use personal protective equipment in the laboratory.
- 3.2.3 Emergency Evacuation Plan, including exits, evacuation routes and designated meeting locations.
- 3.2.4 Chemical labeling, storage, and waste disposal procedures.
- 3.2.5 Location of designated areas for use of carcinogens, reproductive toxins or acutely toxic substances.
- 3.2.6 Location and access instructions for a copy of the laboratory chemical inventory, Chemical Hygiene Plan, safety data sheets and laboratory specific standard operating procedures/lab safety plans or methodologies.
- 3.2.7 Any other pertinent information deemed important by the laboratory supervisor.
- 3.2.8 A record of lab specific training, including the trainee's signature and list of items covered shall be maintained by the Principal Investigator or Lab Supervisor (Current UNCP Faculty or Staff). A copy of all training records shall be available for review by EH&S during annual laboratory inspections.

4.0 STANDARD OPERATING PROCEDURES

The following standard operating procedures are general safety standards applicable to all UNCP laboratories. Individual laboratories should supplement these with laboratory specific standard operating procedures/lab safety plans. EH&S can assist supervisors in developing these plans.

4.1 Personal Protection

The employee's department, without cost to the employee, must supply personal protective equipment. Protective equipment remains the property of the University. The laboratory supervisor will identify additional protective devices required in individual laboratories.

4.1.1 Eye Protection

4.1.1.1 All laboratory users, including visitors, must wear approved eye protection when the potential exists for eye injury (chemical use, high/low temperature, high/low pressure, compressed gas use, vibrating or rotating apparatus use, and continuous operations). Safety goggles/glasses or prescription glasses with side shields may be used as appropriate.

4.1.1.2 Contact lens use – Use of contact lenses are not allowed in labs where fumes or vapors may permeate the lens and cause damage to the eyes of the wearer.

4.1.1.3 Face shields and/or standing guards must be available where face or neck protection is required. Safety glasses or splash goggles must be worn with face shields/standing guards.

4.1.2 Protective Clothing

4.1.2.1 Laboratory users must wear closed toed shoes made of a non-woven material with nonslip soles. The user's ankles cannot be visible and must be covered with socks at all times to protect the ankles.

4.1.2.2 Laboratory users must wear clothing that covers the entire length of the arms and legs at all times. Appropriate clothing must be donned prior to entering the laboratory.

4.1.2.3 Laboratory users must wear a closed lab coat, with all buttons or snaps secured, at all times when working in the lab.

4.1.2.4 Lab coats must be removed before leaving the laboratory.

4.1.2.5 Launder lab coat separately from personal laundry.

4.1.2.6 Nonflammable, nonporous lab coat must be used where corrosive liquid chemicals are used.

4.1.3 Respiratory Protection

4.1.3.1 Respirators should not be used where mechanical means can be used to control exposure.

4.1.3.2 No respirator may be stored or used in a laboratory until the intended laboratory user has completed the requirements of the UNCP Respiratory Protection Program including medical clearance, fit testing and training.

4.1.4 Gloves

4.1.4.1 Use gloves that are compatible with the chemical(s) in use.

4.1.4.2 Inspect gloves to assure the absence of wear, cracks or discoloration before use.

4.1.4.3 Remove gloves before leaving the laboratory or handling uncontaminated items (e.g. a doorknob or phone).

4.1.4.4 Clean or discard gloves immediately after use (consistent with use and contamination).

4.1.4.5 Wash hands immediately after removing gloves.

4.1.4.6 Do not use disposable latex gloves for chemical protection unless you have permission from the Principal Investigator or Lab Supervisor. Be aware of signs and symptoms associated with a latex allergy.

4.1.5 Personal Hygiene

4.1.5.1 Do not prepare, store or consume food or beverages in the laboratory. Food and appliances must be maintained in a location physically separated by a wall from the chemical laboratory.

4.1.5.2 Do not smoke, use or store tobacco products in the laboratory.

4.1.5.3 Do not apply cosmetics in the laboratory.

4.1.5.4 Do not use deionized water or laboratory ice for personal consumption.

4.1.5.5 Wash hands and arms thoroughly before leaving the laboratory, even if gloves have been worn.

4.1.5.6 Never pipette by mouth.

4.1.5.7 Do not taste chemicals.

4.1.5.8 When smelling of chemicals is required, use the wafting technique to do so.

4.1.5.9 Long hair and loose clothing must be constrained.

4.2 Laboratory Practice

4.2.1 Transporting Chemicals

4.2.1.1 Assure all chemical containers have a secure cap that will not allow spillage prior to transport. (Para film or corks are not considered a secure cap.)

4.2.1.2 Transport chemicals within a tightly sealed chemically resistant container inside of a chemically resistant secondary container or pan that can contain any spill or leak.

4.2.1.3 Use elevators for chemical transport where available.

4.2.1.4 No chemical containers may be transported outside a University building without prior notification of EH&S. 4.2.1.5 Ground all metal containers when dispensing flammable liquids. Only small quantities of flammable liquids should be transferred to glass containers.

4.2.2 Shipping Hazardous Materials

4.2.2.1 Must comply with DOT and IATA (International Air Transport Association) regulations.

4.2.2.2 Personnel who directly affect hazardous material transportation must receive general awareness, function-specific, safety and security awareness training.

4.2.2.3 Covered activities include: loading/unloading hazardous materials, preparing hazardous materials for shipment (Packaging/labeling), shipping specimens/samples in dry ice, liquid nitrogen or other hazardous preservative.

4.2.2.4 Training may be provided by the EH&S office upon request.

4.2.2.5 Researchers coming to or leaving the university must not bring or take any chemicals, biologicals or radioactive materials.

4.2.2.6 Security plans and additional in-depth security training are required when shipping certain types or quantities of hazardous materials.

4.2.2.7 For additional information or questions regarding hazardous material transportation and security, please contact the EH&S office.

4.2.3 Chemical Labeling

4.2.3.1 Manufacturer's labels must be maintained on all incoming chemical containers.

4.2.3.2 Torn or defaced labels must be replaced immediately. GHS compliant label must be used that contains:

- the identity of the hazardous chemical
- appropriate hazard warnings
- expiration date (if applicable)
- name and address of the manufacturer or importer
- date of receipt

4.2.3.3 If not in constant possession of the generator, secondary containers must be labeled with:

- the name of the product (in English, no abbreviations, no chemical structures, no formulas)
- hazard warning(s) with pictograms
- date of preparation
- initials of preparer
- expiration date if applicable

4.2.4 Chemical Purchase

4.2.4.1 Choose the least hazardous chemical that will perform for use in laboratory procedures.

4.2.4.2 Purchase the smallest quantity of hazardous chemicals necessary to complete laboratory procedures.

4.2.4.3 Confirm available inventory of chemicals prior to ordering.

4.2.4.4 Chemical purchases with personal funds for use in university laboratories is prohibited.

4.2.4.5 Distance Education lab kits and protocols must have prior approval from EH&S.

4.2.5 Chemical Storage

4.2.5.1 Minimize the quantity of chemicals stored in the laboratory. Inventories must not exceed maximum allowable quantities as indicated in the North Carolina Fire Code. Be particularly aware of materials with a high hazard or shelf life, including peroxide forming chemicals.

4.2.5.2 Chemical inventory must correspond with the written lab manual and standard operating procedures/lab safety plans.

4.2.5.3 Chemicals past their shelf life should be disposed of via the hazardous waste disposal system.

4.2.5.4 Store chemicals in compatibility groups (see EH&S Lab Safety web page for additional information).

4.2.5.5 A maximum total of 10 gallons of flammable liquids may be stored in a laboratory outside of a flammable storage cabinet.

4.2.5.6 Refrigerators/freezers used for the storage of flammable materials must be rated as such.

4.2.5.7 Store all chemicals in a manner that minimizes potential spillage onto personnel, equipment and other chemical containers.

4.2.5.8 Chemicals should be stored in closed cabinets. If open shelving must be used, it must be secured to the wall. Each shelf must have a minimum $\frac{3}{4}$ inch lip.

4.2.5.9 Store liquids, corrosives, and flammables below eye level (4 to 4.5 feet).

4.2.5.10 Provide a barrier between compatibility groups in storage. A compatible shallow tray capable of holding the content of the largest 2 containers in the hazard class will fill this need.

4.2.5.11 Inspect container and label integrity as part of the weekly lab inspection checklist. Clean any spill immediately.

4.2.6 Housekeeping

4.2.6.1 Keep chemical use areas clean and free from contamination. (To protect staff safety, Housekeeping Services will not clean bench tops or other lab areas where chemical contamination is possible.)

4.2.6.2 Close and cap all chemical containers when not in use.

4.2.6.3 Clean drips and/or spillage off of container exteriors immediately.

4.2.6.4 Maintain minimal equipment on working surfaces.

4.2.6.5 Maintain clear exits and aisles.

4.2.6.6 Maintain clear access to fire extinguishers, emergency eyewash and safety shower equipment.

4.2.6.7 Label all doors that are blocked on the interior side of the door and indicate as not intended for use.

4.2.6.8 Keep storage items out of hallways and stairwells. Such items may be removed to campus surplus without notice.

4.2.6.9 Store all supplies and non-floor mounted equipment 12 inches or more off the floor.

4.2.6.10 Follow the [Transfer of Moveable Equipment Form](#) when transferring or surplusing lab equipment.

4.2.7 Compressed Gas Cylinders

4.2.7.1 Must be stored according to compatibility.

4.2.7.2 Must be fully labeled including cylinder content and status (full, empty, or in-service).

4.2.7.3 Must be installed and leak tested by lab personnel who are trained to connect the cylinder properly.

4.2.7.4 Must be secured in an upright position.

4.2.7.5 Must be capped when not in use.

4.2.7.6 Must be used with a compatible regulator and other auxiliary equipment. Assure all threads match those on the cylinder valve outlet.

4.3 Personal Safety

4.3.1 Laboratory Access

4.3.1.1 Only authorized lab personnel may perform approved protocols in University laboratories. Authorized lab personnel is defined as any current University of North Carolina at Pembroke faculty or staff member or currently enrolled student that has successfully completed the required training, including but not limited to EH&S Chemical Hygiene/Laboratory Safety Training.

4.3.1.2 Laboratory personnel must accompany visitors to the laboratory at all times and provide the necessary training. All visitors must be approved by the hosting Department Chair.

4.3.1.3 No unauthorized (nor unsupervised) children may be present in any laboratory where hazardous chemicals are stored or used.

4.3.1.4 Laboratory doors must be locked when the laboratory is unoccupied by laboratory personnel.

4.3.1.5 Lab personnel that know or suspect they might be pregnant should be encouraged to consult their personal physician concerning the potential risks and additional precautions necessary during pregnancy. A copy of the lab chemical inventory, individual laboratory safety plans and current procedures should be provided.

4.3.1.6 Administrative, clerical and other non-lab personnel are prohibited from maintaining workstations in a laboratory.

4.3.2 University property, including laboratory equipment and chemical containers, may not be removed from University facilities.

4.3.3 Horseplay will not be tolerated in the laboratory.

4.3.4 After hours work should be limited. If circumstances require after-hours work, it must be authorized by the Laboratory PI/Supervisor and arrangements must be made to assure the workers' safety. Campus Police must also be notified of after-hours work by calling (910) 521-6235.

4.3.5 No laboratory user should work alone. If circumstances require working alone, it must be authorized by the Laboratory PI/Supervisor and arrangements must be made to assure the workers' safety.

4.3.6 Operations should not be allowed to run unattended without ALL of the following:

4.3.6.1 Laboratory Supervisor's review and permission.

4.3.6.2 A fail-safe provision (E.g.,) 1) A temperature sensor attached to your reflux apparatus can stop the reaction when cooling is lost. 2) Clamp flasks to prevent vibration movement; 3) Secure/clamp condenser hose connections to prevent a break in connection; 4) Place catch pans or trays under apparatus to collect potential spills);

4.3.6.3 Emergency instructions including the nature of the operation, identity of hazardous materials involved, location of emergency cutoff switches and contact information for the individual most familiar with the operation posted outside of the door.

4.3.6.4 Laboratory lights left on.

4.3.7 Hazardous Materials Security Awareness

4.3.7.1 All hazardous materials are potential targets for sabotage and theft but of particular concern are flammables, explosives, corrosives, reactive substances, toxic substances, radioactive materials and infectious agents.

4.3.7.2 Measures must be taken to secure hazardous materials and recognize/respond to security threats.

4.3.7.2.1 Identify and assess vulnerabilities.

4.3.7.2.2 Share information only on a need-to-know basis.

4.3.7.2.3 Someone you hire may pose a security risk. Conduct thorough background checks.

4.3.7.2.4 Maintain updated and accurate inventories.

4.3.7.2.5 Conduct regular inspections and report missing material.

4.3.7.2.6 Secure hazardous materials in appropriate cabinets.

4.3.7.2.7 Lock doors and limit access to authorized personnel.

4.3.7.2.8 Be aware of surroundings and report suspicious activity.

4.3.7.2.9 Do not stereotype an individual as a terrorist or potential perpetrator. Individuals may not fit a preconceived idea of a criminal.

4.3.7.2.10 Most terrorist threats are external but could also include internal threats such as disgruntled employees.

4.3.7.2.11 Take all threats seriously and report them to your supervisor and UNCP Police (910-521-6235).

4.3.8 Eyewash Stations

4.3.8.1 Must meet the requirements of [ANSI Z358.1-2009](#). (Portable eyewash bottles or drench hoses will not meet this requirement.)

4.3.8.2 Must be used to supply 15 minutes' worth of clear running water to fully clean the eye.

4.3.8.3 Use should be followed by appropriate medical treatment.

4.3.8.4 Must be operated weekly to assure proper function and minimize bacterial contamination. Weekly functional tests must be documented and the record given to EH&S annually.

4.3.8.5 Any eyewash or safety shower that fails the weekly test or needs repair must be written up and reported to Facilities Services for repair. EH&S must also be notified.

4.3.8.6 Access to the equipment must be unimpeded at all times.

4.3.9 Safety Showers

4.3.9.1 Must meet the requirements of [ANSI Z358.1-2009](#).

4.3.9.2 Use should be followed by appropriate medical treatment.

4.3.9.3 Must be operated weekly to assure proper function and minimize bacterial contamination. Weekly functional tests must be documented..

4.3.9.4 Access to the equipment must be unimpeded at all times.

4.3.10 Fire Extinguishers

4.3.10.1 Fire extinguishers will be installed by Facilities Operations when required. The type of extinguisher provided shall be determined by the type and size of fire most likely to occur in the laboratory.

4.3.10.2 All uses of fire extinguishers shall be reported to EH&S to assure extinguishers are fully charged and operational.

4.3.10.3 The EH&S office will ensure inspection of all fire extinguishers monthly.

4.3.10.4 It is University Policy to for occupants to evacuate and activate the fire alarm upon the discovery of a fire. Only individuals who have completed fire extinguisher training through the EH&S office and are comfortable that they can safely discharge the unit should try to use extinguishers. Training may be requested through EH&S.

4.4 Laboratory Controls

4.4.1 Ventilation

4.4.1.1 General room ventilation patterns must not be altered. Do not block room air supply grills, return duct grills or remove drop ceiling tiles. Laboratory doors should remain closed (laboratory doors should be provided with self-closing hardware to assure proper operation of the ventilation system).

4.4.1.2 Canopy style local exhaust ventilation may only be used when no other form of ventilation is practical or when no toxic substances will be released (e.g. heat control for large apparatus).

4.4.1.3 Local exhaust should be used to capture point source discharges of toxic chemicals from apparatus as appropriate.

4.4.1.4 Toxic chemicals should not be used outside of a chemical fume hood or other containment system in rooms where air is re-circulated, (e.g. clean rooms or cold rooms).

4.4.2 Chemical Fume Hoods

4.4.2.1 Use the chemical fume hood for all operations that might result in an odoriferous, volatile, toxic or harmful release.

4.4.2.2 Assure that the hood is drawing properly prior to use.

4.4.2.3 Work at least 6 inches into the fume hood.

4.4.2.4 Elevate large apparatus 2 inches off of the hood deck with blocks at each end to allow airflow under the apparatus except where the elevation would make the equipment unstable.

4.4.2.5 Maintain the sash no higher than the posted height while in use and close sash when hood is not in use.

4.4.2.6 Do not use the fume hood for storage. (Vented storage cabinets should be used for vented storage.)

4.4.2.7 A continuous monitoring device such as a thin strip of tissue paper or manometer should be installed on chemical fume hoods to allow the user to assure proper direction of flow before beginning a task.

4.4.2.8 No ductless or recirculating fume hoods may be used in UNCP facilities.

4.4.2.9 All fume hoods will be evaluated at least annually. Facilities and EH&S will coordinate outside contract support to conduct testing of the equipment.

4.4.2.10 All fume hood installations and removals must be in accordance with State and Federal regulations and be reviewed by EH&S.

4.4.3 Specialized Hoods

4.4.3.1 Biosafety Cabinets

4.4.3.1.1 Biosafety Cabinets are inspected and certified annually and when the unit must be moved.

4.4.3.2 Gloveboxes

4.4.3.2.1 Seals and gloves must be inspected prior to each use of a glovebox.

4.4.3.2.2 Gloveboxes will be evaluated annually.

Note: There are no water-wash hoods available on campus. Heating of highly concentrated acids is prohibited. Contact EH&S for assistance.

4.4.4 Other Laboratory Control Equipment

4.4.4.1 Laboratory staff shall inspect specialized laboratory control equipment prior to each use to insure function

5.0 Chemical Waste Management

Chemicals must be identified as waste for disposal or surplus for redistribution.

5.1 Training:

5.1.1 Hazardous Waste/Satellite Accumulation training is required for all employees who produce, handle, or accumulate hazardous waste.

5.1.2 The training is to be completed upon initial employment/assignment to a laboratory, if an employee is in need of retraining due to hazardous waste deficiencies in their respective laboratory, as well as every 3 years after review/revision of the Chemical Hygiene Plan.

5.1.3 The training is included in the Chemical Hygiene/Laboratory Safety Training, and it is located on the EH&S Chemical and Hazardous Waste web page.

5.2 Chemical Waste for Disposal:

5.2.1 Containers

5.2.1.1 Collect materials in original type containers that are compatible with the collected material. Improper containers (i.e. milk jugs, vegetable oil bottles) will not be collected for disposal and it will be the laboratory's responsibility to transfer the waste to an appropriate container.

5.2.1.2 Collect material in containers free of incompatible residue.

5.2.1.3 Containers must have a closed, tight fitting cap that will not leak if the container is tipped on its side. (Corks, stoppers, etc., are not acceptable.)

5.2.1.4 Containers must be free from exterior damage or contamination.

5.2.2 Collection

5.2.2.1 Collect waste by compatibility groups.

5.2.2.2 Collect a minimum number of different chemicals in the same container.

5.2.2.2.1 Do not pour all of the experiments into one container for collection.

5.2.2.2 Each experiment should be in a separate container for waste collection.

5.2.2.3 Collect chemicals by disposal groups as listed below:

- Acids (unless neutralized as end step in procedure)
- Bases (unless neutralized as end step in procedure)
- Ethers/Peroxide Forming Agents
- Sulfides
- Heavy Metals
- Chlorinated Solvents
- Amines
- Acutely Toxic Wastes
- Alcohols /Non-Chlorinated Solvents
- Antineoplastic Drugs

5.2.2.4 Maintain 1 to 1 1/2 inches of air space in the top of any container.

5.2.2.5 Keep containers closed at all times except when materials are being added. (Remove funnels once waste is poured into the container and screw on cap)

5.2.2.6 Transfer materials inside of a chemical fume hood.

5.2.2.7 Maintain hazardous waste collection containers inside of secondary containment labeled "Satellite Accumulation Area".

5.2.2.7.1 Clean up any spills or residual chemicals on containers immediately upon discovery.

5.2.2.8 Chemical compounds that decompose to dangerous explosive compounds (e.g., dry picric acid, expired ethyl ether) require special handling. Do not move the container. Contact EH&S immediately upon discovery.

5.2.3 Container Labels

5.2.3.1 Label and date each waste container with its contents when the first product enters the container. Update the label each time a different material is added. The full chemical name must be written out on the waste label or the container will not be collected.

5.2.3.1.1 All containers must be labeled 'Hazardous Waste', dated, and full chemical name listed.

5.2.4 Pick-up Process

5.2.4.1 EH&S will schedule two yearly pickups scheduled with one in May and one in December.

5.2.4.2 Departments will provide a list of chemicals for pick-up to EH&S in April and November. This should include unwanted chemicals and unknown chemicals.

5.2.4.3 Large-scale pick-ups (e.g., lab clean-outs) will be done by special arrangement.

5.2.4.4 Improperly packaged or labeled waste will not be accepted.

5.2.4.5 Each department will be required to maintain a minimum of two trained individuals in order to ensure manifests are legally signed at the time of hazardous waste pick-up. Training will be coordinated through the EH&S Office.

5.2.5 Drain Disposal

5.2.5.1 No chemical may be disposed in the drain without prior EH&S approval.

5.2.5.2 Flush drain system with water at a minimum 3:1 ratio following all EH&S approved drain disposals.

5.3 Sharps, Glass and Plastic

5.3.1 Sharps

5.3.1.1 Used or contaminated needles, syringes, small bore pipettes, slides, lancets, scalpels and razor blades are to be placed in a red sharps container.

5.3.1.2 No part of a sharp may extend beyond the cap of the sharps container at any time.

5.3.1.3 Seal sharps container when they reach $\frac{3}{4}$ full and call Student Health Services for disposal.

5.3.2 Broken Glass

5.3.2.1 Place uncontaminated large bore pipettes and broken laboratory glass into a rigid cardboard box labeled "Broken Glass".

5.3.2.2 Seal the box when $\frac{3}{4}$ full for pick up by Facilities Operations.

5.3.3 Plastic

5.3.3.1 Place uncontaminated plastic into a rigid cardboard box labeled "Broken Plastic".

5.3.3.2 Seal box when $\frac{3}{4}$ full for pick up by Facilities Operations.

5.4 Spills

5.4.1 Chemicals

5.4.1.1 Laboratory user may clean up small spills when they have the necessary materials in the laboratory and have the appropriate training to clean it up safely. (See the EH&S web page for specific spill clean-up recommendations.)

5.4.1.2 All spills involving mercury must be reported to EH&S immediately at 910-521-6792.

5.4.1.3 Spills involving a large quantity of material, high level of toxicity, materials capable of causing damage to the laboratory structure, or a material the laboratory user is not comfortable with should be referred to EH&S at 910-521-6792.

5.4.1.4 Spills that the user cannot clean up that occur after normal business hours should refer to UNCP Police by calling 910-521-6235. Evacuate the area and wait to meet UNCP Police and/or EH&S.

5.4.1.5 Each department must maintain material appropriate spill kits to respond to spills in their area (corrosive, mercury, heavy metal, etc.).

6.0 MEDICAL CONSULTATION

6.1 Reporting - All accidents/potential exposures/near misses must be reported to a Laboratory Supervisor immediately. An accident report must be completed and submitted to HR and EH&S.

6.2 Availability - All employees who work with hazardous chemicals will have an opportunity to receive medical attention and any necessary follow-up care through HR at no cost under the following circumstances (NOTE: Students who work with hazardous chemicals should seek medical attention and any necessary follow-up care through UNCP Student Health Services).

Lab Supervisor must either contact HR or access the EH&S Office Accident Reporting webpage for appropriate forms for employees. Injured students must complete a Student/Visitor Incident Reporting/Investigation form which is also found on the EH&S Office Accident Reporting webpage).

6.2.1 When the employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory.

6.2.2 When exposure monitoring reveals an exposure level above an action level or permissible exposure limit for an OSHA regulated substance for which there is a medical surveillance requirement.

6.2.3 When an event likely to produce a hazardous exposure occurs while the employee is in the laboratory. (E.g., a spill, leak or explosion.)

6.3 Options

6.3.1 Life or limb threatening injury or illness

6.3.1.1 Dial 911; (Notify dispatchers of potential contamination to assure prompt and appropriate care).

6.3.1.2 Notify your Laboratory Supervisor as soon as possible.

6.3.1.3 Notify HR and EH&S as soon as possible.

6.3.2 Non-life or limb threatening injury or illness

6.3.2.1 Notify your Laboratory Supervisor.

6.3.2.2 Notify HR (910) 521-6279 and EH&S (910) 521-6792 as soon as possible.

6.3.2.3 HR, based upon the recommendation of a licensed physician or physician's assistant, will make referral to the appropriate health care provider for necessary medical treatment. (910-521-6279)

6.4 Information

6.4.1 The following information should be provided to the attending physician by the laboratory user or laboratory supervisor.

6.4.1.1 Identity of the hazardous chemical to which the laboratory user may have been exposed. (Including the SDS if available. EH&S will assist in obtaining this if necessary)

6.4.1.2 Description of the conditions under which the exposure occurred.

6.4.1.3 Description of the symptoms experienced by the employee.

6.4.2 The Lab Supervisor should provide the following information to EH&S & HR.

6.4.2.1 The information in 6.4.1.1 through 6.4.1.3 above.

6.4.2.2 Completed copies of the Campus Incident Reporting Forms (Employee Incident Report Form, Supervisor Incident Report Form, Student/Guest Incident Reporting Form, Etc.) which are available through HR and on the EH&S website.

6.4.3 The following information should be provided by the examining physician and must be provided to the exposed worker:

6.4.3.1 Recommendations for further medical follow-up.

6.4.3.2 The results of the medical examination and any associated tests.

6.4.3.3 Any medical condition revealed during the examination that may place the individual at increased risk as a result of exposure to a hazardous chemical in the workplace.

6.4.3.4 A statement that the worker has been informed of the results of the consultation/medical examination and any medical condition that may require further examination or treatment. This must not reveal any specific findings/diagnosis unrelated to occupational exposure.

6.5 Follow-up

6.5.1 All events that require medical treatment must be reported to EH&S & HR as soon as possible. No payment for medical treatment will be made until HR has reviewed the case. Contact EH&S at 910-521-6792.

6.5.2 Each incident will be investigated by the laboratory supervisor and EH&S in an attempt to identify potential causal factors and possible corrective actions.

LABORATORY SAFETY REGULATIONS

1. DO NOT ENTER THE LAB AREA unless your instructor is present. Research students must be supervised by either their faculty advisor or a designated department staff member.
2. BE AWARE of any special health or safety hazards posed by the chemicals with which you are working. Obtain and read SDS (Safety Data Sheets) for all employed reagents prior to working with them in lab, and consult your instructor with any questions or concerns you may have. Many SDS(s) can be found online (see your lab instructor/research supervisor for assistance).
3. PROTECTIVE EYEWEAR, either safety goggles/glasses or prescription glasses with side shields, must be worn at all times in the lab when the potential for eye injury exists. Instructors will specify which of these two types of protective eyewear is required for his/her lab section. Students are responsible for purchase of this eyewear (the UNCP bookstore stocks safety goggles and glasses). Contact lenses **should not** be worn in lab.
4. APPROPRIATE CLOTHING that covers you from your shoulders to your ankles, and closed shoes with socks, are required. In general, the more skin covered the better. Laboratory coats provide additional protection to your body and your clothing and are required (students are responsible for purchase of lab coats). Long hair should be pulled back and held securely away from the face. Bulky and hanging jewelry should be removed.
5. USE OF HEADPHONES / EARBUDS is prohibited as such prevents the lab worker from being fully aware of his/her surroundings.
6. SAFETY EQUIPMENT (fire extinguishers, fire blankets, safety showers, eyewash stations, fume hoods, snorkel exhausts) is located throughout the laboratory. Consult your instructor/advisor if you are unfamiliar with the location or operation of any safety equipment.
7. WORKING IN THE LAB UNDER THE INFLUENCE of alcohol or drugs, including certain prescription and over-the-counter pharmaceuticals that may impair motor function and/or judgment, constitutes a safety hazard to both you and your labmates and is strictly prohibited.
8. AVOID INHALING VAPORS of any kind by performing as much work as possible under operating hoods. Use the hoods to perform any reactions involving toxic, irritating, or otherwise dangerous chemicals or unpleasant odors. When a procedure calls for testing the odor of a gaseous substance, gently waft the substance toward your nose with your hand (never place a container directly beneath your nose!)
9. INFORM YOUR INSTRUCTOR/ADVISOR IMMEDIATELY OF ACCIDENTS, no matter how minor you judge them to be. Do not clean up broken glassware or chemical spills until directed by your instructor/advisor.
10. CONDUCT ALL EXPERIMENTAL WORK IN A PROFESSIONAL MANNER, and never deviate from the written procedure unless directed by your instructor. Never work without your instructor present. Research students should consult his/her faculty advisor for assistance with and/or approval of any nonstandard lab procedures.
11. NEVER PUT ANYTHING IN YOUR MOUTH while in the laboratory, i.e., no eating, drinking, tasting chemicals, pipetting by mouth, etc. Food and beverages are not allowed in the laboratory.
12. INFORM YOUR INSTRUCTOR/ADVISOR IF YOU ARE OR THINK YOU MAY BE PREGNANT, as some chemicals, particularly those used in upper level labs, are thought to pose special and continuing risks to the fetus, including birth defects and death.
13. DISPOSE OF CHEMICAL WASTE only as specified by your instructor/advisor. Never dispose of substances in the sink or wastebasket unless your instructor/advisor specifically directs you to do so.
14. SCRUPULOUSLY CLEAN YOUR WORK AREA AND YOUR HANDS after completing lab work. It is especially important to remove gloves and thoroughly wash your hands upon leaving lab to prevent transfer of chemicals. If you take a break during the lab period, be sure to wash your hands BEFORE you use the rest room.

LAB SAFETY SIGN-IN ROSTER

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Instructor: _____ Date: _____

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