

CHEMICAL HYGIENE PLAN

DEPARTMENT OF WILDLIFE, FISHERIES, AND CONSERVATION BIOLOGY

Contact Person: Carly Sponarski
Campus Office: 222 Nutting Hall
Contact Phone Numbers:
Office: 207-581-2909
Cell: 217-778-2295

Department of Wildlife, Fisheries and Conservation Biology
210 Nutting Hall
University of Maine
Orono, Maine 04469

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TABLE OF CONTENTS

INTRODUCTION.....	3
PROGRAM ADMINISTRATION AND RESPONSIBILITIES.....	4
DESIGNATED CHEMICAL USE AREAS.....	6
EMPLOYEE TRAINING.....	7
RECORD KEEPING.....	7
PERMISSIBLE EXPOSURE LIMITS.....	8
LABORATORY CHEMICAL HYGIENE.....	9
General hygiene and prudent practices.....	9
Things to do.....	10
Safety Data Sheets.....	11
Standard operating guidelines.....	12
Chemical storage.....	14
Disposal of chemicals.....	17
Chemical spills.....	19
Fume hoods.....	23
CHEMICAL HYGIENE FOR FIELD WORK.....	24
Things to do.....	24
Standard operation guidelines.....	25
MEDICAL CONSULTATIONS AND EXAMINATIONS.....	27
APPENDICES.....	29
1. University of Maine SEM Personnel, Contact Information, and Links Mentioned in the CHP	
2. Employee Safety Training Record form EXAMPLE	
3. Maine Cooperative Fish and Wildlife Research Unit’s Job Hazard Analysis Evaluation form EXAMPLE	
4. Graduate Student Employee Safety Training Requirements narrative	
5. Signature page for Annual review of Safety Training for the Wildlife, Fisheries, and Conservation Biology department	
6. Emergency Action Plan for the Wildlife, Fisheries, and Conservation Biology department	

INTRODUCTION

The University of Maine and Department of Wildlife, Fisheries, and Conservation Biology are committed to conducting chemical and laboratory operations in the safest possible manner, with concern for the individual and in accordance with all applicable Federal and State statutes. This document designates the chemical use laboratories in the Department and describes the responsibilities of employees, supervisors, the Department, and University for chemical safety, required training and record keeping, and required safety procedures. We have divided the detailed portion of this document on required procedures into separate sections for laboratory workers and field work because of the varied nature of the work in this Department. Be aware that the section on Laboratory Chemical Hygiene may still be more appropriate for even simple chemical use (e.g., preserving and storing biological samples) at a remote biological field station.

This document is intended to provide only the basic requirements and guidelines for chemical safety for the Department. Laboratory or project-specific standard operating guidelines are required as well. As outlined later, we are suggesting that a chemical safety notebook be created for appropriate work stations for making this document and operating procedures available to chemical users and inspectors.

The subject of who is responsible for chemical safety in the Department is an important one. The division of responsibilities among laboratory/field workers/students, faculty, chemical hygiene officer (same as Safety Coordinator in our Department), and the Chair for chemical safety in the Department follows the policy of the University of Maine. These will be clearly designated in the following section. Some additions to University policy have been made to clearly include chemical use in field work and to clarify graduate student responsibilities. Everyone should understand their individual responsibilities.

The question "What is a chemical?" seems to be a common hurdle for faculty, staff, and students to cross before they will think proactively about chemical safety issues. The more appropriate question to ask yourself if you are an employee using any substance (liquid, solid, or gas) is, "Do I know for a fact that this substance is not hazardous?" If you are a Principal Investigator or supervisor the appropriate question is, "Do I know for a fact that the substance being used by an employee I supervise is not hazardous?" Even products we commonly buy at grocery stores or use at home may be hazardous in some situations (e.g., prolonged use or in confined situations). Information and assistance to answer these questions are available in the Department and the University.

PROGRAM ADMINISTRATION AND RESPONSIBILITIES

Individuals and organizations at the University have specific responsibilities for chemical hygiene. Below are summaries of the responsibilities of the Department of Safety and Environmental Management (SEM) and the Department of Facilities Management (FM) and the specific responsibilities of the Department Chair, Departmental Safety Coordinator, and Supervisors. Supervisors include laboratory supervisors, principal investigators, and classroom instructors. Probably the most significant element of this policy is that supervisors have the front-line responsibility for ensuring chemical safety, i.e., generally the faculty in the Department of Wildlife Ecology. See Appendix 1 for links to SEM and FM web pages.

Department of Safety and Environmental Management (SEM)--This department advises the university community on regulatory requirements, conducts fume hood certifications, inspects facilities, manages waste disposal, and assists with hygiene plans and other issues.

Department of Facilities Management (FM)--Maintains and inspects fume hoods, ventilation systems, emergency eyewashes and showers, and life safety systems.

Department Safety Coordinator

1. Responsible for the writing, implementing and updating of Chemical Hygiene Plans
2. Provides a copy of the department Chemical Hygiene Plan to SEM upon initial implementation and when significant changes are made.
3. Maintains laboratory and department compliance with the written Chemical Hygiene Plan.
4. Assists Department Chair with addressing regulatory compliance within the department's laboratories.
5. Conducts random inspections to monitor compliance with the written Chemical Hygiene Plan.
6. Organizes training sessions for the department (e.g., Wilderness CPR and First Aid).
7. Disseminates information to laboratory managers/supervisors, principle investigators, teaching assistants and classroom instructors.
8. Monitors the use and disposal of chemicals in the departmental laboratories.
9. Works with the Department of Safety and Environmental Management to address worker health and safety concerns, engineered controls and improved processes that

will minimize chemical usage and chemical and biological waste.

Laboratory Manager/Supervisors, Field Supervisors, Principal Investigators, and Classroom Instructors

Laboratory and Field Supervisors generally refers to staff in professional positions and does not include graduate students. Graduate students may assist with some tasks (e.g., completing chemical inventories, weekly flushing of eyewash stations), but supervisors, PIs, and instructors are ultimately responsible for the eight tasks listed below.

1. Ensure that workers know the chemical hygiene rules, personal protective equipment is available and in working order, and that appropriate training is provided.
2. Provide regular, formal chemical hygiene and housekeeping inspections, including routine inspections of emergency equipment (e.g., spill kits).
3. Determine the required levels of protective apparel and equipment using the University's Personal Protective Equipment (PPE) assessment form. See Appendix 1 for links to resources available on the SEM web page.
4. Develop Standard Operating Procedures (SOPs) or Standard Operating Guidelines (SOGs) for specific procedures in coordination with individual employees.
5. Identify and controls sources of hazardous conditions within the laboratory and in field situations.
6. Maintain **ultimate responsibility** for compliance, chemical hygiene and safety in the laboratory and in the field.
7. Complete and submits annual chemical inventories to SEM, according to institutional, local, state and federal requirements.
8. Report potential over-exposures of hazardous chemicals to Risk Management (Appendix 1).
9. Provide UMaine's Chemical Hygiene Officer (Appendix 1) with new or modified job descriptions that might require baseline medical evaluations.

Laboratory or Field Workers, Graduate Students

1. Attend required training programs.
2. Plan and conduct each operation in accordance with procedures and prudent practices outlined in the chemical hygiene plan

3. Develop and practice good chemical hygiene habits.
4. Report suspected or potential safety and health hazards to the laboratory manager or field supervisor.
5. Wear prescribed personal protective equipment
6. Review appropriate laboratory and/or departmental SOPs or SOGs and demonstrate proficiency in the performance of assigned tasks (including appropriate chemical hygiene and safety practices).
7. Maintain the ultimate responsibility for his/her personal safety on the job.

DESIGNATED CHEMICAL USE LABORATORIES AND WORK AREAS

The following are the designated chemical use areas on campus for the Department of Wildlife, Fisheries, and Conservation Biology. Be aware that designation of these areas as chemical use limits their use for some other activities. Consumption or storage of food or beverages of ANY kind is strictly forbidden in rooms where chemicals are stored or used. Students and faculty who are not conducting experiments should not regularly occupy a chemical use laboratory where large quantities of chemicals are stored or being used. Note also below the information on storage of chemicals in other locations.

214 Nutting Hall - biological sample and chemical (alcohol, miscellaneous fluids) storage. Supervisor: Joe Zydlewski.

224 Nutting Hall – biological sample analysis laboratory. Supervisor: Erik Blomberg.

232 Nutting Hall - biological sample and chemical (alcohol, miscellaneous fluids) storage. Supervisor: Cyndy Loftin.

242 Nutting Hall – biological sample and chemical (alcohol, miscellaneous fluids) storage. Supervisor: Steve Coghlan.

112 Nutting Hall – biological sample storage. Supervisor: Alessio Mortelliti.

114 Nutting Hall – biological sample and chemical (alcohol, miscellaneous fluids) storage. Supervisor: Mac Hunter.

124A/B Nutting Hall – biological sample and chemical (alcohol, miscellaneous fluids) storage. Supervisor: Dan Harrison.

132 Nutting Hall (wet lab) - biological sample and chemical (alcohol, miscellaneous fluids) storage. Supervisors: Joe Zydlewski, Steve Coghlan, Cyndy Loftin

Pole Barn - Motor fuels and lubricants may be stored only in the metal safety cabinets and containers designated for this purpose.

Deer Pen Barn - Motor fuels and lubricants may be stored only in the metal safety cabinets and containers designated for this purpose.

Boat Barn - Motor fuels and lubricants may be stored only in the metal safety cabinets and containers designated for this purpose.

Remote field sites - It is the responsibility of principal investigators to manage chemical use and storage at remote sites and during remote field work in accordance with applicable rules for on-campus sites. PIs should work with the Safety Coordinator to develop reasonable guidelines and protocols.

EMPLOYEE TRAINING

The following departmental requirements for training are identical to University of Maine policy.

SEM recommends using the Chemical Hygiene Plan/Lab Safety Training outline as a guide when providing Lab Safety training, which can be found at the SEM website (Appendix 1). All employees are required to participate in **Basic Safety Awareness Training**, which can be found at the SEM training website ([Appendix 1](#)). Training will be provided at the time of an individual's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations, such as a change in job description, job location, or chemical hygiene plan. In addition CHP/Lab Safety will be provided on an annual basis. Individuals exhibiting a lack of knowledge or understanding of health and safety practices shall be re-trained immediately.

The Department Safety Officer will provide initial training to department staff on requirements of the Chemical Hygiene Plan and when modifications are made. Laboratory or field supervisors, principal investigators, and instructors will provide general and project-specific training to employees and students working with chemicals.

Students, staff, and faculty associated with the USGS Maine Cooperative Fish and Wildlife Research Unit must complete additional required training identified in the annually-renewed (September) Job Hazard Analysis (JHA) completed by the Unit scientist with whom they are working. Additional training may be required, following annual re-issue of the JHA; work with your Unit Supervisor to identify and arrange for this training.

RECORD KEEPING

The Department will maintain training records for a period of 5 years, unless otherwise specified by associated regulations. Training records must include the name and signature of the attendee,

the name or description of the training course, the name of the instructor, and the date the course was administered. Copies will be kept in the Wildlife, Fisheries and Conservation Biology office (210 Nutting Hall), but each lab supervisor should also keep copies in their labs.

The Department will maintain Personal Protection Equipment (PPE) Hazard Assessments for the duration of the assessed activity plus 3 years. Amendments to original PPE Hazard Assessments will be maintained with the original.

Current Safety Data Sheets (SDS) shall be accessible, in the individual laboratories. Archived MSDSs and Laboratory Chemical Inventories should be maintained in the WFCB archives for 30 years.

The Department will maintain copies of inspections for a minimum of 1 year.

The USGS Maine Cooperative Fish and Wildlife Research Unit stores digital records (certificates as pdfs in the Digital Measures record-keeping system) of all completed training and paper copies of annual Job Hazard Analyses for 5 years.

PERMISSIBLE EXPOSURE LIMITS

Employee health and area exposure monitoring may be required for a particular laboratory or process. For laboratory uses of OSHA regulated substances, the University of Maine Chemical Hygiene Officer (581-4056) or Industrial Hygienist (581-4087) will assess and perform monitoring to determine if individual exposures to such substances exceed the Permissible Exposure Limits (PEL). If test results indicate that the exposure limits have been exceeded or have the potential to be, corrective measures will be taken to reduce worker exposure. Laboratory supervisors should be aware of PELs for potentially hazardous compounds and take appropriate steps for monitoring if they suspect exposure problems in their laboratories. An individual who manifests symptoms such as headache, rash, nausea, coughing, tearing, irritation or redness of the eyes, irritation of the nose or throat, dizziness, loss of motor dexterity or judgment, etc. should report this immediately to their supervisor. Any or all of the above conditions may warrant inquiry as to whether a potential overexposure has occurred and whether an exposure assessment should be conducted.

LABORATORY CHEMICAL HYGIENE

General Hygiene and Prudent Practices

Individuals working in laboratories shall conduct themselves in accord with the best standards of laboratory technique and precaution.

In research laboratories, the objective of a procedure often is to prepare a substance never previously characterized, termed a research generated sample. Unless these substances are known to be harmless, they should be treated as if hazardous; that is, handled with the same care and respect as a substance known to possess at least moderate toxicity.

Maintaining a laboratory in good order, clean, well-organized, with easy access to protective equipment and swift exit in case of emergency, also is prudent practice. None of us would care to eat food prepared in a kitchen caked with the residue of years of cooking and served on dishes not washed since they were purchased. Doing laboratory work under such conditions also is dangerous.

Before initiating any procedure involving chemicals the prudent investigator informs her- or himself of the potential risks and the appropriate methods and equipment for minimizing those risks, making use of SDSs and Standard Operating Guidelines. The procedure is set up in an appropriate environment (e.g., a fume hood), uncluttered, with clean glassware. The investigator will be wearing appropriate Personal Protective Equipment for the procedure involved. If there is potential for a violent reaction, a face or reaction shield may be necessary. A spill kit will be at hand. Coworkers in the laboratory will have been informed of the nature of the experiment so that they may respond appropriately in the event of an emergency.

When the process is complete, if appropriate, disassemble and clean the equipment. Lab cleanliness is the responsibility of the supervisor but generally speaking, dirty equipment and glassware should not be allowed to pile up on a desktop or in a hood. Any material spilled during setup and work should be promptly cleaned up and disposed of appropriately. The lab bench or fume hood should be left ready for the next experiment.

We list here some items of general housekeeping and prudent practice. Some of these points are sufficiently evident that they should not need listing; however, all reflect problems observed commonly in laboratories.

- Absolutely NO food or beverages of any kind may be stored or consumed in a laboratory where chemicals are manipulated or stored. This includes cans of soft drinks, tea bags, instant coffee, cereal, bottled water, etc.
- Buildings on the University of Maine campus are smoke free. In addition, smoking materials (or snuff or chewing tobacco) may not be stored in any laboratory. Since they

are for oral consumption, OSHA categorizes them as food.

- All spills, of whatever origin, must be cleaned up immediately, no matter how harmless the material spilled (including water). Areas around balances and sinks are particularly likely to become messy and eventually dangerous, as repeated spills generate uncharacterized mixtures. Small/incidental spills may be handled by the lab worker, however, the chemical worker must decide whether or not the spill requires a non-emergency clean-up or emergency response procedures (addressed it on Page 19), and proceed accordingly.
- Keep aisles and doorways clear of furniture, boxes, and other impediments. Do not allow electrical cords to trail across aisles, and do not lead tubing for gas or water flow across these areas. All occupants of a laboratory must be able to exit the lab quickly in an emergency.
- Never introduce any part of your body except hands and arms into a fume hood. Raising the sash and leaning into the hood to check a reaction is the single most dangerous action one can perform in a laboratory; this can result in exposure to fumes and cause personal injury.

Things To Do

1. Place the Department Chemical Hygiene Plan in a 3-ring binder, and keep in a prominent location in your laboratory where it is readily accessible. Review the plan annually to remind yourself of its content.
2. Collect SDSs for all chemicals stored or commonly used in your laboratory. Place them in alphabetical order in a binder and shelve it with the Chemical Hygiene Plan. Visit at least one SDS Web site and make sure you know how to find new SDSs. See section on **Safety Data Sheets** below.
3. For procedures that are conducted in your laboratory, develop and put in writing: (a) standard operating procedures and guidelines, (b) emergency protocols, and (c) special cleanup procedures. These documents be kept in a notebook with the Department CHP and the laboratory-specific MSDS sheets. See Section on **Standard Operating Guidelines** below.
4. Sort the chemicals stored in your laboratory into the appropriate hazard categories and color code their labels. Place a service request with SEM to remove chemicals that are no longer wanted. Color code appropriate storage cabinets and shelves, and distribute the chemicals into their proper locations. Post the color code charts near the chemical storage area. Post an up-to-date chemical inventory on the cabinet door to that the cabinet contents are easily reviewed. See section on **Storage of Chemicals in Laboratories** below
5. Have a spill kit readily available in the laboratory space.
6. Make sure appropriate PPE is available: goggles, gloves, and lab coats or aprons that will fit everyone who uses the lab; a face shield, a reaction shield, or other special equipment.
7. Check your waste collection system. Make sure containers are properly labeled. If they are in a hood, place them in a plastic tub and label the hood 'For Storage Only'. Make sure all documentation (list of contents, inspection forms) for your waste accumulation site is in order and easily accessible to inspectors. See section on **Disposing of Chemicals** below.
8. Have a container dedicated to “sharps” (e.g., non-medical waste blades, broken glass) storage, and clearly label it as such.
9. Obtain an inspection sheet from SEM ([Appendix 1](#)) and conduct an annual inspection of your laboratory.

Safety Data Sheets

The Department of Labor (OSHA) requires you to have a Safety Data Sheet (SDS) for every chemical substance you keep or use in a laboratory. The SDS provides information on any known toxic properties of the substance, its corrosiveness or flammability, and how to deal with

spills, accidental exposure, and fires involving the substance. The SDS is the key to safe laboratory practice. See the SEM web site ([Appendix 1](#)) for a full explanation of the information on SDSs. SDS's must be immediately available to staff for all chemicals stored within a lab space. Ideally, SDS's should be acquired from a chemical's original manufacturer. If an SDS was not provided with a chemical purchased for use in your lab, the easiest way to get one is to use the Internet. Appendix 1 provides links to SDS resources. You should keep a notebook of hard copies of SDSs for substances stored or in use in your laboratory.

For drugs, copy information sheets enclosed in packaging and add to your notebook. Drugs should not be stored in laboratories without the laboratory supervisor's direct permission.

Standard Operating Guidelines

Development and formalizing of Standard Operating Guidelines (SOG) [also known as Standard Operating Procedures (SOP)] for your laboratory is a major action required to complete chemical use planning. Standard Operating Guidelines are intended to provide guidance on working safely with specific classes of chemical or for specific procedures in your laboratory. SOGs include the following categories of information:

1. **Hazard Assessment.** Prior to beginning work, you should determine whether the materials you will work with pose any special hazards and what special precautionary measures may be required to cope with these hazards. SOGs should include information on the PPE required, hazard(s), exposure route(s), and symptoms of overexposure for the chemicals used in each SOG.
2. **Notification of the Office of Safety and Environmental Management.** Some categories of hazards require that you notify the SEM office prior to beginning work. For example, the initial use of reproductive hazards in a laboratory requires SEM notification.
3. **Personal Protective Equipment (PPE).** Note that although there is a basic personal protective equipment requirement for General Laboratory Work and the Necropsy Lab (see below), a PPE hazard assessment (form available at sem.umain.edu/forms/) should be done for all research activities to identify job-specific PPE. In general, you should always make use of the following:
 - **Eye Protection.** If no possibility of a splash hazard exists, safety glasses that meet the requirements of the Practice for Occupational and Educational Eye and Face Protection and are equipped with side shields may be worn but are not necessary for many procedures (supervisors should determine the level of protection in their lab for each procedure). **Safety glasses do not provide protection from splashes; therefore, when working with hazardous chemicals, goggles or face shields should be worn.** This is University policy, as well as safe practice. Prescription (street) glasses are NEVER adequate for protective purposes, but may be worn *under* goggles when required for clear vision.

- **Gloves.** Consult the SDS or Glove Compatibility charts for selection of proper glove materials.
- **Lab Coat or Apron.** Consult the SDS to determine if the substances you are using require coats or aprons made of special materials.

4. **Safety Equipment.** Consult the SDS to see if any special safety equipment is required before beginning any new type of experiment. The following should be available in every laboratory:

- **Eyewash.** A drench or flush type eyewash station is necessary when working with many kinds of materials. Bottle-type eyewashes generally are not acceptable. Eyewash stations must be flushed on a weekly basis and a record sheet kept nearby that is dated each time.
- **Safety Shower.** Use the safety shower both chemical splashes.
- **Safety Shielding.** Safety shielding is required any time an experiment involves a risk of explosion, high exothermicity, or splash hazard. The sash of a fume hood, in the lowest feasible position, provides appropriate shielding. Portable shields are acceptable if placed so as to protect *all* laboratory occupants, and are a useful accessory in hoods as well.

5. **Ventilation**

- **Fume Hoods.** Any process that may release noxious or flammable gases, or that involves flammable substances with high vapor pressure, must be conducted in a fume hood (see section on **Fume Hoods** for proper procedure).
- **Glove (Dry) Boxes or Bags.** If inert or dry atmospheres are required in handling of chemicals, such as pyrophoric materials, glove boxes or bags flushed with dry nitrogen or argon may be employed.

6. **Emergency Procedures.** Consult the SDS to determine if any special emergency procedures must be developed for the substances with which you are working. If so, put the procedures in writing, and add them to the section on emergency procedures in your laboratory chemical hygiene manual. Such procedures should address at least the following issues:

- Emergency telephone numbers (SEM, University police, your advisor, the building manager).
- The locations of all safety equipment.
- How to warn others in the event of an emergency.
- Special spill control materials required.
- Any special first aid treatments.
- Be sure you are familiar with the Department's Emergency Action Plan.

7. **Gas Cylinders.** Be sure that equipment is available for securing any gas cylinders that may be needed to supply gases for your experiment. Cylinders must be firmly restrained by a clamp affixed to a bench top or hood, or confined in a restricted area by a strong chain. Lecture bottles of gases also must be restrained, either by clamping to a ring stand with a heavy base or in a rack specially designed for the purpose.

8. **Labels and Signs.** All chemicals and solutions in use must be clearly labeled with the full name and not just the chemical formula. Hand-written labels are acceptable. Chemicals in secondary containers (i.e., not in the original packaging) should be labeled with the name of the chemical, the name of the preparer, the data prepared, and a hazard statement or picture indicating if the chemical is flammable, corrosive, reactive, and/or toxic. When especially hazardous materials or procedures are in use, the hood or other work area should carry a warning sign.

9. **Designated Areas.** Some procedures and chemicals may be used only in designated areas of a laboratory. For example, special areas marked with caution tape or signs must be set aside for work with reproductive hazards.

10. **Special Storage.** The substances used must be stored appropriately to their hazard category, as described in the **Chemical Storage** section of the department's Chemical Hygiene Plan. Any special storage requirements, such as for pyrophoric materials, should be determined from the SDS.

11. **Vacuum Equipment.** If the use of high vacuum is part of the experimental procedure, precautions must be taken to avoid injury should evacuated glassware implode. This may mean conducting work in a hood with the sash at the lowest feasible level or behind a portable shield. **Mechanical vacuum pumps** must be protected by cold traps, so that experimental materials do not reach the pump where they might be vented into the room. For some kinds of materials, the pump must be vented into a hood.

12. **Waste Disposal.** Consult SEM (Appendix 1) to determine if there are any special disposal requirements. In general, all chemicals are considered hazardous waste unless a waste determination has been made to the contrary.

Chemical Storage in Laboratories

Laboratory Chemical Storage Guidelines

Chemical storage begins with buying the minimum amount of chemical necessary. The true cost of storing chemicals includes not only purchase price but also the cost of storage cabinets and secondary containment. Minimizing purchases minimizes costs.

Minimized chemical inventories provide a safer workplace, minimize the risk from spills, reduce disposal costs, and protect the environment.

Storage Area

- Storage should be away from exits, heat, and direct sunlight.
- Substantial shelves or cabinets are required, capable of supporting the chemical containers, resistant to chemicals, and should have a lip.

- Nothing should be stored over shoulder height of an employee without special provisions, such as a proper step stool.
- Proper ventilation needs to be supplied and special ventilation may be required (consult the SDS).
- **Flammables require an approved storage cabinet if more than 10 gallons are present at any one time. (Cabinets are recommended for all flammable liquids.)**
- If refrigeration is required, then an approved refrigerator (special models for flammable or explosive storage) with proper signage needs to be provided.
- **Restricted access is recommended for highly toxic or regulated chemicals to prevent unauthorized access.**
- Bench tops should not be used as storage areas.
- Chemicals cannot be stored on the floor. (exception gas cylinders)
- **Gas cylinders must be segregated according to compatibility, stored away from heat sources and egress, upright, and secured so that they will not fall over.**

Compatibility

Chemicals must be stored in such a manner to avoid interaction between incompatible chemicals. There are many systems to ensure proper storage, many of which are based on color coding the chemicals' labels, with compatibles being the same color. Always consult a chemicals SDS to assist you with determining storage. Once segregated into compatible groups, the chemicals can be put in alphabetic order.

The University-recommended color coding storage system is the Baker system, which has been used successfully for a number of years.

Color	Hazard
Red	Flammable hazard
Yellow	Reactivity hazard
White	Corrosive or contact hazard
Blue	Toxic or poison (store in secured area)
Orange	No serious hazard - can be stored together
Diagonal stripe	Incompatible with other materials in that storage group – store separately

Exception to the Baker System is Sulfuric acid (Store with oxidizing acids.)

Within each hazard category there are reasons to further separate materials. Baker has chosen to show these by striping the storage color-coding. The stripes denote chemicals that should be separated from the other colors and from others in the same hazard class. More information on this system can be obtained from the Department of Safety and Environmental Management, which can be reached at 581-4055 and can help with developing a chemical storage system.

If your chemical labels are not color coded, colored labels can be obtained from most office

supply stores. In order to accommodate any employee who is color blind we recommend that you print the name of the color on the colored label.

Containers

- Must be constructed from a proper material that is compatible with the chemical that it will contain and be physically sound. (no rust or bulging)
- Have tight fitting lids that prevent a spill when the container is tipped.
- All containers must be labeled with contents and hazards. (including gas cylinders)
- Gas cylinders must have cap installed when not being used.
- All liquid chemicals must be stored with secondary containment (e.g., placed on a tray or other lipped container) to capture leaks. Be certain that the secondary containment does not allow leaking chemicals to mix.
- **Food containers may not be reused to store chemicals or hazardous waste even if relabeled.**

Segregation

- Sufficient space should be provided so that incompatible chemicals can be segregated.
- **Do not store incompatible chemicals in the same cabinet.**
- **Segregation should be completed using four cabinets and an area for general chemical storage, (Cabinets are required for oxidizing acids, other corrosive acids, bases, and flammables over ten gallons).**
- **The only exception to the above segregation guidelines is for laboratories where very small quantities are stored. All exceptions require a consultation with the Safety Coordinator and approval by Safety and Environmental Management.**
- Secondary containment should be provided for liquids that are flammable, corrosive, highly toxic, or highly volatile.
- **Polypropylene or polyethylene plastic containers should be used to provide both segregation and secondary containment. This will not work in the case of chemicals that attack the plastic tubs or give off fumes that interact with an incompatible stored nearby.**

Procedures

- Upon receipt of a new chemical, it should be labeled with the date received, the name of the person who obtained it, and color coded if necessary. Some chemicals become unstable over time and also need a disposal date posted. Check the SDS sheet for guidance.
- The chemicals then need to be placed upright, in a proper storage area with compatible chemicals.
- Storage area should be inspected regularly for leaking or defective containers and chemicals that have been put in the wrong place.
- Only have the quantities on hand that you can reasonably expect to use in the next year or less.
- A current chemical inventory must be maintained (post a copy on the outside of the storage cabinet and another in the MSDS notebook) and MSDS kept current.

Disposal of Chemicals

It is our responsibility to dispose of the materials with which we work safely and in accordance with the law. Laws regarding the disposal of chemicals are enforced by the Federal Environmental Protection Agency (EPA) and the Maine Department of Environmental Protection (DEP).

If a chemical is no longer being used it should be disposed of. Contact SEM (Appendix 1) for guidance about how to properly dispose chemicals that are no longer being used. SDS for chemicals no longer being used should be archived when the chemical is removed from the lab.

Legal Disposal into Sewer Systems

The majority of chemical substances must be disposed of by transmitting them to a company licensed to operate a disposal facility. Others may be treated by a trained individual to reduce the quantity of material that must be disposed of through SEM. A few substances can be treated and flushed down the drain by any reasonably careful person, provided that this treatment is defined as part of the experiment in which the 'waste' was produced. Chemicals in which biological samples have been stored must be disposed by means other than flushing.

Acids and Bases. Mineral acids and bases in batches of 500 ml or less (contact SEM for additional guidance) may be neutralized and the resulting salt solutions flushed down the drain so long as they are not environmentally toxic. Use the following steps:

- Prepare a dilute aqueous solution of the acid or base to be destroyed in a beaker or wide-mouth flask. Always add acid or base to an excess of water. Never add the water to the acid or base, because the heat generated may be enough to boil the water, and expel the substance violently from the container. Set the container in a plastic tub containing ice-water while preparing the solution.
- Similarly, prepare a dilute solution of sodium hydroxide if you wish to neutralize an acid, or hydrochloric acid if you are neutralizing a base. Cool this solution in ice-water also.
- Using pH paper or a pH meter, and keeping the receiving flask in the ice-bath, neutralize to pH 6.6-7.4. Stir well while mixing the solutions.
- Turn on the cold water in the sink to a vigorous stream, and wash the neutralized solution down the drain.
- **Other Inorganic Compounds** also may be dissolved in water and flushed down the drain with much cold water, provided they do not contain any heavy metals or toxic anions. Thus, sodium, potassium, magnesium, and calcium salts may be disposed of in this way, but copper, tin, lead, silver, iron, cobalt, nickel, chromium, zinc, manganese, and mercury salts may not be. Chlorides, bromides, carbonates and bicarbonates, sulfates, and nitrates may go down the drain, but fluorides, sulfides, bisulfides, and cyanides may not. Many states and towns have ordinances against

phosphates in detergents; hence, phosphate salts generally should not go down the drain. If you are not absolutely sure of proper disposal regulations, consult with the SEM.

Illegal Disposal into Sewer Systems

With the exception of the inorganic compounds noted under (A), most states and the federal government prohibit the disposal, except by a licensed contractor, of:

- All heavy metals and their salts;
- All sulfides, bisulfides, and cyanides;
- All other toxic or corrosive inorganics;
- All organic compounds except ethanol;
- All gases not normally constituents of the earth's atmosphere.

The SEM can assist you with determining proper disposal methods if you are uncertain.

Satellite Hazardous Waste Accumulation Sites

Other than the limited number of substances described above, all laboratory wastes, unused or unwanted chemicals, and research generated samples must be collected and disposed of by SEM.

The EPA now defines the places within our laboratories where we temporarily store the wastes generated in our teaching and research as 'Satellite Hazardous Waste Accumulation Areas' (SAA). These areas, usually consisting of one or more labeled glass containers, must be managed in accordance with the following rules.

- All SAA managers and any individuals responsible for utilizing the SAA must complete the online SAA Training available on SEM's web page. This training must be completed initially and annually thereafter. Records of training should be kept for at least the duration that an employee's duties involve using, inspecting or managing the SAA.
- You must keep separate containers for incompatible kinds of waste. Incompatible here means exactly what it did when we discussed storage. Thus, for example, acidic and basic wastes should not be added to the same container.
- A record must be kept of the nature and approximate quantity of each addition to a waste container. The record must be attached to the container, or kept immediately adjacent.
- The container must be labeled as 'Hazardous Waste' (even if it is not really hazardous). Sub-labeling, such as 'Chlorinated Solvents' is useful in keeping wastes properly segregated.
- Containers must be kept closed, unless there is potential danger of gas formation (in the latter case containers must have a vented cap).

- Each site must be inspected weekly by a responsible individual, designated by the lab supervisor. A form confirming the inspection must be signed, and kept adjacent to the storage area. Weekends and legal holidays are excluded from this requirement.
- If hazardous waste is not being generated in a lab for an extended period of time, the lab supervisor can arrange to have any existing hazardous chemical waste picked up, and then inform SEM that their SAA is temporarily suspended, and daily records do not need to be kept. The current SAA record should have a statement such as “SAA Closed as of such a date” recorded on the weekly log. Whenever a SAA is started (or started up again) a statement such as “SAA collection begins on such a date” or similar statement should be recorded on the existing weekly log. This shows continuity and regulatory compliance in the event the SAA is inspected.
-
- A hood that is used for waste storage may not be used for experimentation. EPA and OSHA differ, in fact, on just where waste containers may be stored; OSHA prefers otherwise unused hoods, but EPA prefers any storage location where a spill will not reach a floor or sink drain. If a hood is being used for as specific purpose (such as waste storage) there should be a written sign on it indicating the hood’s use.

The University SEM Office will pick up waste upon request. A form to notify SEM of the chemicals (s) and quantities is required (Appendix 1)

Unknown Waste

Unidentified substances present a major problem for both storage and disposal. A substance may not be kept in the stockroom or laboratory without an SDS being available (unless it is a substance for which no SDS exists, such as a research generated sample).

Unknowns can be removed by the SEM staff, but their disposal by the firm with which the University contracts is much more expensive than disposing of known hazardous materials. Hence, the best policy is:

- Do a thorough cleanup of your laboratory and dispose of all unknowns at one time.
- Subsequently follow the storage and labeling practices described above to ensure that no unknowns are generated in the future.

CHEMICAL SPILLS

All users of a laboratory need to take Chemical Spill Training [see: <http://sem.umaine.edu/safety-training/catalog/#content>] from SEM, and also be trained annually by the lab supervisor on the location and use/activation of the following emergency equipment in their lab:

- Emergency Eyewash.

- Emergency Shower.
- Fire Alarm System.
- Spill Kit.

Chemical Spill Guidelines

Chemical Spills are separated into two classes: **emergency** and **non-emergency**. Emergency spills should be immediately reported to Public Safety, and no clean-up should be attempted. *An emergency spill is one, which is beyond your capability or can not be cleaned up safely.* You should be familiar with the SDS content for the chemicals you are using (BEFORE A SPILL OCCURS), so that you can take proper action should a clean-up be necessary.

Non-emergency spills may be cleaned up by the laboratory workers providing they are trained and can do so safely.

Factors to be considered:

- *Injuries resulting from the spill.*
- *Area affected by the spill*
- *Identity of chemical spilled and the degree of hazard.*
- *Availability of proper PPE and Spill kit.*
- *Level of training of individual who will perform clean-up.*

Emergency Chemical Spill Guidelines

1. If you have been contaminated by the hazardous material, take immediate action.
 - Most likely, this will be the use of the Emergency Shower or Eyewash. Rinse for a full fifteen minutes.
 - While taking action, shout for help and let others know of the danger.
 - Seek medical attention.
2. If you have not been contaminated, leave the room, secure the door, and warn others to stay away.
3. Activate the Evacuation/Fire Alarm and call 911 from a safe place.
4. Give the dispatcher the following information:
 - Location of the spill (building, room number and portion of room affected);
 - Identify the material spilled;
 - Your name and phone number where you can be reached.
5. Meet the Emergency Responders and identify yourself as the person who reported the spill.
6. Remain available until the commander of the HazMat Response Team tells you your help is no longer needed.

7. The Incident Commander of the Fire Department is in charge of the incident, and is required to follow very strict procedures. These procedures can take from one-half hour to five hours or more. Many times these procedures can be shortened by having accurate and timely information from the people involved.
8. Do not re-enter the building until it is declared safe by the authorities.

Non-Emergency Chemical Spill Guidelines

1. Determine that you can safely handle the situation with your available resources.
2. Alert others in the area to the problem.
3. Prevent others from coming into contact with the hazardous material, by barricading, locking doors, establishing warning signs, or having some-one stand at the entrance to direct traffic.
4. Perform the cleanup in accordance with your **area-specific** protocols.
5. Call Safety & Environmental Management to report the Spill 581-4055, and report the following information:
 - Where and when the spill occurred;
 - Who was involved (both name and phone number);
 - What chemical was spilled;
 - The quantity spilled;
 - How the clean-up was accomplished.
6. Safely dispose of the material resulting from the spill by placing it in a compatible, sealed container and label it as “Spill Cleanup Material”. This label must also contain a list of the chemical contents of the spill including amounts and concentrations. Complete and send a request for chemical pickup form to Safety and Environmental Management.

Spill Kits

Spill Kits can either be purchased or be assembled in the laboratory. A spill kit must be **readily accessible**. **Each spill kit must have a label stating the types and quantities of chemicals it can clean up.**

Example of a general spill kit:

1. Five-gallon plastic pail with tight fitting lid. (To hold spill kit and waste)
2. Absorbent such as cat litter, sand or, Speedi-Dri. (These react with very few chemicals.)
Clearly mark on the container the quantity and type of the various chemicals that this spill kit can safely clean-up.
3. Plastic scoop and scraper for dispensing and picking up absorbent material.

4. Proper gloves resistant to chemicals used in the laboratory.
5. Splash resistant Chemical Goggles
6. Chemical resistant apron or lab coat.
7. Other PPE as needed per assessment of chemicals in Laboratory.
8. Heavy-duty plastic bag(s) to contain hazardous waste generated by clean-up.
9. Neutralization materials such as sodium bicarbonate for acids or powdered citric acid for bases.
10. Decontamination supplies, many times just soap and water.
11. A copy of the area-specific SOP for spill clean-up should be placed on top of all of the other supplies.

Inexpensive kits are available from chemical and safety suppliers. These kits contain the most commonly needed supplies and are pre-rated for clean-up capacity. The contents should be inspected before the beginning of each school year to ensure that materials are adequate and functional for the work area. A copy of the area-specific SOP for spill clean-up should be placed on top of all of the kit.

Guidelines for Chemical Spill Protocols

- *An assessment of the inhalation hazards posed by each chemical.*
- *A spill inside an operating chemical fume hood has to be treated differently than a spill on the floor.*
- *Temperature of the chemical and surroundings.*
- *Surface area of spill.*
- *Reactions with surroundings and other chemicals.*
- *Ventilation in room.*
- *Experience in dealing with similar spills.*
- Toxicity of the chemical and the proper Personal Protective Equipment (PPE) needed to protect the worker.
- Appropriate method of clean-up typically absorption or neutralization.
- Flammability and special precautions needed.
- Decontamination procedure once spilled material is cleaned up.
- Equipment needed to perform a clean-up.
- Training needed to accomplish a safe clean-up.

Example of a protocol for chemical spill clean up

1. Determine what was spilled.
2. Determine if this is an emergency (see “**Factors to be considered**”)
3. Warn others in the area and request assistance as needed.
4. Don the appropriate Personal Protective Equipment (PPE).
5. If flammable extinguish ignition sources.
6. Add neutralizing/absorbent material around the area/perimeter of the spill to stop its spread and then continue adding absorbent until spill is completely neutralized and covered.
7. Gather waste into suitable container.
8. Decontaminate area and tools as appropriate.
9. Document per laboratory protocol.
10. Call Safety and Environmental Management to report spill.
11. Replenish spill kit materials.

Some sources of chemical spill clean- up information:

- Manufacturer’s MSDS
- Manufacturer’s catalogs and publications.
- Prudent Practices in the Laboratory Handling and Disposal of Chemicals by the National Research Council (Appendix 1)
- CRC Handbook of Laboratory Safety ([Appendix 1](#))

Fume Hoods

*Ensure the hood is operating properly **before** beginning work with hazardous chemicals.*

- Verify that an SEM issued yellow sticker is present and indicates that the hood has been certified within the last twelve (12) months as properly operating.
- For newer hoods, verify that the continuous airflow indicator denotes a proper operating status for the hood.
- For older hoods without airflow indicators, perform a simple test to ensure flow by observing a tissue taped to the hood door and observing its movement when the hood exhaust fan is operated.
- Verify that the hood has not been taken out of service during an attempted certification by SEM. The presence of a brown and white “DANGER – DO NOT USE” sticker indicates a hood failure during certification and repairs must be initiated.
- ***Never work with hazardous chemicals if the hood is not operating properly or you suspect it is not operating properly.*** Immediately contact Work Control (581-4400) to report problems and initiate corrective action. After repair, the hood must be re-certified by SEM before the hood may be used.

- Keep the hood sash pulled down to the safe operating level as indicated on the yellow sticker present on the hood, unless installing or removing equipment.
- Use the sash as a safety shield when boiling liquids or conducting an experiment with reactive chemicals.
- Only place hands and forearms inside a hood. ***Leaning into the hood to obtain a better view places a person's face closer to the experiment and is particularly dangerous.***
- Keep hoods orderly and uncluttered. Minimize storage of chemicals, hazardous waste, and apparatus/equipment in the hood and do not allow these items to block vents or airflow.
- Hoods used for chemical storage cannot be used for experimentation.

CHEMICAL HYGIENE FOR FIELD WORK

This section is analogous to the section on Laboratory Chemical Hygiene, but it is limited to guidelines and information more appropriate for field work situations in the Department (e.g., collection and preservation of biological samples and immobilization of animals with drugs). The section on Laboratory Chemical Hygiene provides expanded information on the topics covered below. If chemical use at field stations is similar to chemical use in traditional indoor laboratories then you must use the section on Laboratory Chemical Hygiene for guidance.

Things to do

1. Obtain a notebook (3-ring binder) for the Department Chemical Hygiene Plan and put it in a prominent location in your work station.
2. For chemical use procedures that are unique to your field work, develop and put in writing: (a) Standard Operating Guidelines, and (b) emergency protocols. These documents also should go in the safety notebook with the department Chemical Hygiene Plan. See section on **Storing Chemicals** under **Laboratory Chemical Hygiene** for more specific information on chemical storage. Note also that drug storage and use requires special security and monitoring.
3. Sort the chemicals stored in your work station into the appropriate hazard categories and store them appropriately.
4. Collect SDSs for all chemicals stored or commonly used in your laboratory. For drugs, information sheets supplied with drugs provide analogous information. Place them in the notebook with the Chemical Hygiene Plan.
5. Put together a spill kit (or obtain a commercially available one) if it is appropriate.
6. Make sure appropriate Personal Protective Equipment is available.
7. Obtain proper safety equipment for transporting chemicals to field sites and include transportation protocols in the Standard Operating Guidelines (SOG) for Fieldwork (details below).

8. Contact the department Safety Coordinator or SEM about disposal procedures at field sites. Departmental policy is to avoid producing chemical waste at remote sites if possible. If chemical waste is unavoidable, a waste collection system will be necessary. Investigators should make every effort to keep their waste production in the Small Quantity Generator (SQG) category. More information on waste disposal is included under the following section.
9. Conduct an annual inspection of your remote site if chemicals are stored there.

Standard Operating Guidelines (SOG) for Field Work

Development and formalizing standard operation guidelines for you fieldwork is the major action required to complete chemical use planning. SOGs are intended to provide guidance on working safely with specific classes of chemical or with specific procedures.

SOGs include the following categories of information:

1. **Hazard Assessment.** Prior to beginning work, you should determine whether the materials you will work with pose any special hazards. A Personal Protective Equipment assessment (see page 12) must be completed for each procedure or type of procedure you conduct in the field, and hazard(s), exposure route(s), and symptoms of overexposure for the chemicals used in each SOG need to be included.
2. **Personal Protective Equipment (PPE).** Note that there is a basic personal protective equipment requirement for all field work in the Department (see page 12). There also is a PPE hazard assessment form at the SEM website ([Appendix 1](#)). Consult the MSDS for all substances you will work with to learn what special PPE may be necessary. In general, you should always make use of the following when using chemicals:
 - **Eye Protection.** If no possibility of a splash hazard exists, safety glasses that meet the requirements of the Practice for Occupational and Educational Eye and Face Protection and are equipped with side shields may be worn. **However, safety glasses do not provide protection from splashes; therefore, when working with hazardous chemicals, goggles or face shields MUST be worn.** This is University policy, as well as safe practice. Prescription (street) glasses are NEVER adequate for protective purposes, but may be worn *under* goggles when required for clear vision.
 - **Gloves.** Consult the MSDS or the glove guide provided by the Department for selection of proper glove materials.
 - **Lab Coat or Apron.** Consult the MSDS to determine if the substances you are using require coats or aprons made of special materials.
3. **Safety and Spill Equipment.** Consult the MSDS to see if any special safety equipment is required for working with specific chemicals. In addition to the spill kits required in chemical use areas, a chemical resistant tray should always be used in the field as a work platform to prevent spills to the environment.
4. **Transporting Chemicals.** Secondary transportation containers must be used to transport

chemicals in vehicles. These containers prevent chemicals from leaking if a container breaks. These can be obtained through chemical suppliers and cost approximately \$40 for one that will hold a 2.5 L bottle. Containers also must be adequately secured in vehicles. Flammable chemicals must be transported in a container that is fire-proof. There are limits to the amount of chemicals that may be transported. Consult with SEM on regulations when larger volumes need to be transported and on any of the above issues if you have questions.

5. **Emergency Procedures.** Consult the SDS to determine if any special emergency procedures must be developed for the substances with which you are working. If so, put the procedures in writing. Such procedures should address at least the following issues:

- Emergency telephone numbers (SEM, local police, fire department, your advisory, local medical center).
- Locations of all safety equipment.
- How to warn others in the event of an emergency.
- Special spill control materials required.
- Any special first aid treatments.

6. **Labels.** All chemicals in use must be clearly labeled with the full name and not just the chemical formula. Hand-written labels are acceptable. When especially hazardous materials or procedures are in use, the work area should carry a warning sign.

7. **Drug storage and use.** All immobilizing drugs stored on campus will be stored in a lock box stored in a locked refrigerator in a room with controlled key access, i.e., one that is not opened by a key that multiple users have. **The PI is responsible for identifying a location for secure drug storage, with a dated inventory system to account for drug removal and return to the designated storage location.** Field workers also will keep a log book of drug use. The log book will include for each usage the date, drug name, amount (ml) used, species, purpose, and name of the person administering the drug. **Principal investigators supervising the fieldwork using these substances ultimately are responsible for adhering to requirements for maintaining and using these inventories.**

8. **Waste Disposal.** Waste production at field sites should be minimized. Monitoring and chemical pick-up by SEM is more difficult at remote sites. Generating ethanol and formaldehyde waste from preserving biological specimens can be avoided by careful planning and conservative use of these chemicals. Specimen transfer procedures that may produce waste of these chemicals should be done back on campus if possible.

If chemical waste at remote sites is unavoidable, you must work with the SEM to develop a waste disposal system using the SEM guidelines for 'Waste Management at Remote Sites'. Investigators should make every effort to keep their waste production to in the Small Quantity Generator (SQG) category. To meet the requirements for this category, no more than 55 gallons of hazardous waste or 1 kg of acutely hazardous waste can be stored at any time. A waste container must be removed with 180 days of the 'Container full date'. Each hazardous container must be properly labeled. Review MSDS sheets for information on specific chemicals you are

using and also see the read the section on **Disposal of Chemicals** under **Laboratory Chemical Hygiene**. All procedures for disposal must be outlined in the SOG.

Medical Consultations and Examinations

Purpose

- The purpose of a medical consultation is to determine whether a medical examination is warranted.
- When assessment indicates that an employee may have been exposed to a hazardous chemical:
 - The employee will have the opportunity (and is encouraged) to obtain a medical consultation under the direct supervision of a licensed physician; and
 - If the consultation indicates that a medical examination is needed, the employee shall be provided an opportunity to see a licensed physician who has experience in treating victims of chemical overexposure.
 - Details of the consultation, examination, any tests, and follow-up are determined by the physician and are considered confidential.
 - Examinations must be under the direct supervision of a licensed physician and must be at no cost to the employee.

Communication and Information

- University of Maine will consult the Principal Laboratory Investigator or other person thoroughly familiar with the conditions of employee exposure before medical consultations or examinations are scheduled.
- Information for baseline evaluations will be based on the job descriptions, chemical exposures, chemical inventories, and any other relevant information that is available to all parties.
- Once a baseline determination has been made, the physician will work with the Office of Human Resources to establish medical baseline requirements.
- In the event of a potential overexposure, the Principal Laboratory Investigator or other responsible party must provide the physician with the following information:
 - The known or identifiable components of the hazardous chemical(s) to which the individual may have been exposed;
 - A description of the condition under which the exposure occurred including quantitative exposure data, if available; and
 - A description of the signs and symptoms of exposure that the employee is experiencing, if any.

Access

- University of Maine shall provide all individuals who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations that the examining physician determines to be necessary, under the following circumstances:
 - Whenever an individual develops signs or symptoms associated with a hazardous

- chemical to which the employee may have been exposed in the laboratory;
- Where exposure assessment reveals an exposure level routinely above the action level or the PEL for an OSHA regulated substance; or
- Whenever an event takes place in the work area such as a spill, leak explosion or other occurrence resulting in the likelihood of a hazardous exposure.
- Baseline medical evaluations shall be provided to all individuals determined to have a potential for exposure to specific hazardous materials. The determination for testing will be based upon:
 - Review of the job description;
 - Information provided by the Principal Laboratory Investigator;
 - Evaluation of the specific task by the University of Maine Industrial Hygienist; and
 - Consultation with an occupational physician.

Physician

- All medical consultations and examinations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.
- For consultation or examination under this standard, the Office of Human Resources shall obtain a written opinion from the examining physician that includes the following:
 - any recommendation of further medical follow-up;
 - the results of the medical examination and any associated tests;
 - any medical condition that may be revealed in the course of the examination that may place the employee at increased risk as a result of exposure to a hazardous workplace; and,
 - a statement that the employee has been informed, by the physician, of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.
- Results of medical consultations or examinations shall be considered confidential information. The written physician's opinion will not reveal specific findings of diagnoses unrelated to occupational exposure.

APPENDICES

Visit SEM website for current versions of forms mentioned in the plan:

<http://sem.umaine.edu/forms/>

1. University of Maine SEM personnel and contact information, and other links mentioned in the CHP.
2. Employee Safety Training Record form EXAMPLE
3. Maine Cooperative Fish and Wildlife Research Unit's Job Hazard Analysis Evaluation form EXAMPLE
4. Graduate Student Employee Safety Training Requirements narrative
5. Signature page for Emergency Action Plan for the Wildlife, Fisheries, and Conservation Biology department
6. Emergency Action Plan for the Wildlife, Fisheries, and Conservation Biology department

APPENDIX 1

University of Maine SEM personnel, contact information, and links mentioned in the CHP

Safety and Environmental Management (SEM)

581-4055 581-4085(fax)

<http://sem.umaine.edu>

[e-mail: sem@maine.edu](mailto:sem@maine.edu)

<u>Office</u>	<u>Contact Person</u>	<u>Phone</u>
Public Safety	Police	911 or 581-4040
SEM Director	Dr. Wayne Maines	581-4055; cell 949-2254
SEM Associate Director/Industrial Hygienist	Michael Souda	581-3037; cell 949-4901
Diving Operations Manager, Boating Safety	Chris Rigaud	581-3146 x232 or 581-3321 x232
Hazardous Waste Manger/Chemical Hygiene Officer	Peter Snow	581-4056; cell 812-8491
Safety Officer	Jill Rand	581-4088
Facility Emergency Coordinator	Lisa Burton	581-4058; cell 669-5724
Hazardous Waste Assistant	Dale Violette	581-4077

- Additional web resources:UMaine Department of Facilities Management (FM):
<https://umaine.edu/ofm/>
- Risk Management: <http://sem.umaine.edu/accident-reporting/>
- SDS resources:
<http://chemistry.umeche.maine.edu/Safety/Msds.html>

<http://www.msdssearch.com/msdssearch.htm>
<http://www.msds.com/>

- Prudent Practices in the Laboratory Handling and Disposal of Chemicals by the National Research Council: <http://www.nap.edu/html/prudent/>
- CRC Handbook of Laboratory Safety (<http://www.crcnetbase.com/isbn/9781420038460>).

APPENDIX 2.
EMPLOYEE SAFETY TRAINING RECORD

**Safety Guidelines for all Staff,
Students, and Employees**

*Department of
Wildlife, Fisheries, and
Conservation Biology*



Name: _____

Supervisor: _____

Position: _____

Academic Year: _____

Type of Training	Requirement	Took	Expires
<input checked="" type="checkbox"/> University Basic Safety Training ¹	Annual	_____	_____
<input checked="" type="checkbox"/> Department Emergency Action Plan (on reverse)	Annual	_____	_____
<input checked="" type="checkbox"/> Mandatory Information Security Training ²	Annual	_____	_____
<input type="checkbox"/> Chemical Hygiene (Lab Safety)	Prior to Use	_____	n/a
<input type="checkbox"/> Fieldwork Safety Training ¹	Prior to Use	_____	n/a
<input type="checkbox"/> Adult CPR Course	2 years	_____	_____
<input type="checkbox"/> First Aid Course	2 years	_____	_____
<input type="checkbox"/> UMaine Vehicle Driver Agreement (must be 21)	Prior to Use	_____	n/a
<input type="checkbox"/> USGS Federal Vehicle Guidelines	Annual	_____	_____
<input type="checkbox"/> USGS Annual Motor Vehicle Operator Certification	Annual	_____	_____
<input type="checkbox"/> Fire Extinguisher Training ¹ refresher	3 years	_____	_____
<input type="checkbox"/> Over-the-water Training [UMaine does not offer]	5 years	_____	_____
<input type="checkbox"/> USGS Individual Volunteer Services Form ⁴	Prior to Use	_____	n/a
<input type="checkbox"/> Animal Care & Use Training ³	4 years	_____	_____
<input type="checkbox"/> Supervisor Safety Training ¹	Prior to Use	_____	n/a
<input type="checkbox"/> Computer Workstations ¹	Annual	_____	_____
<input type="checkbox"/> _____	_____	_____	_____
<input type="checkbox"/> _____	_____	_____	_____
<input type="checkbox"/> _____	_____	_____	_____

On-Line Training can be found on the Department of Safety and Environmental Management's web page:
<https://sem.umaine.edu/>.

Mandatory Information Security Training can be found at <https://bb.courses.maine.edu/> to log in to Blackboard using your UMS ID and password (the same ID and password that you use for MaineStreet access)

On-Line Animal Use & Care Training can be found on the Research Compliance – Institutional Animal Care and Use Committee (IACUC) web page: umaine.edu/research/research-compliance/institutional-animal-care-and-use-committee-iacuc/web-based-training/.

Required if you are riding in a USGS vehicle or volunteering at a USGS research site.

APPENDIX 3.

Maine Cooperative Fish and Wildlife Research Unit’s Job Hazard Analysis Evaluation form

Safety Guidelines for all Staff, Students, and Employees



For Academic Year September 1 – August 31 _____

Date: _____

Employee Name: _____

Supervisor: _____

Select the option below that best describes your position

- USGS student/staff/volunteer who works in the field or laboratory
○ USGS student/staff/volunteer/administrative employee who does not work in the field or the laboratory
○ WLE/EES student/staff/volunteer who works in the field or laboratory
○ WLE/EES student/staff/volunteer/administrative employee who does not work in the field or the laboratory

1. Do you perform work activities in a laboratory setting?

- No ○ Yes

2. Do you participate in field-based work activities?

- No ○ Yes, select one option below
□ All of the field sites I visit are within an hour of the nearest medical facility
□ One or more of the field sites I visit are more than an hour from the nearest medical facility)

3. Do you operate any motor vehicles?

- No ○ Yes, check all that apply:
□ I drive passenger cars or trucks
□ I drive ATV's, snowmobiles or other off-highway vehicles (OHV)

4. Do you work in a remote site or drive a vehicle or stay in an RV that has a fire extinguisher available?

- No ○ Yes

5. Do you work on or around the water (or ice)?

- No ○ Yes, check all that may apply:
□ I use non-motorized watercraft (canoe, kayak, inflatable, etc.)
□ I operate motorboats
□ I am a Motorboat Operator Certification Course (MOCC) Instructor
□ I work on ice covered lakes or rivers

6. Do you participate in electrofishing activities?

- No ○ Yes, check one:
□ I am an electrofishing crew leader
□ I assist with electrofishing sampling but never as crew leader

7. Do you use or participate in any of the field activities below?

- No ○ Yes, check all that apply:
□ I operate chainsaws
□ I operate machinery, woodworking or other power tools
Other (e.g., ladder use, bear spray use, work around dams)
□ Please list: _____
□ Please list: _____

Note: Changes to activities during the academic year need to be assessed to update required training.

Revised 4/2014

APPENDIX 3.

Maine Cooperative Fish and Wildlife Research Unit's Job Hazard Analysis Evaluation form
(continued)

8. Are you a non-USGS student/staff member that may ride in a USGS vehicle or volunteer for field work?
 No Yes

9. Are you involved with the use of live vertebrate animals in research?
 No Yes

10. Are you supervising a field or laboratory crew?
 No Yes

11. Will you be working on a computer for more than 4 hours a day on most of your work days?
 No Yes

12. I will require the following training that is not listed:

Supervisor Signature: _____
(Required)

Employee preferred email: _____
(Required)

Note: Changes to activities during the academic year need to be assessed to update required training.

Revised 4/2014

APPENDIX 4.



Graduate Student Employee Safety Requirements

As a new graduate student employee prior to beginning work you MUST review this fact-sheet and complete the following Safety and Environmental Management requirements:

1. Annual Basic Safety Training – Online

Prior to beginning work activities ALL graduate employees must complete Basic Safety Training. You can complete this training on-line at <https://sem.umaine.edu/safety-training/>. Print out a copy of your test record and training outline.

On-line Instructions: **If you do not have a PeopleSoft ID number you must check the box below the People Soft ID Number box and enter your name and the name of your department. Note: This training must be completed on an annual basis to make sure you are kept informed of UMaine Safety and Environmental Management rules and regulations.**

2. Department Annual Safety Training

When you report to your supervisor, he/she must conduct the department specific safety and environmental training. The training must also include other key safety and environmental information related to your job assignments or work locations.

Instructions: **Provide YOUR SUPERVISOR with a copy of the Annual Basic Safety Training record you printed off when you took the on-line Annual Basic Safety Training, your supervisor must review the following topics and document this training by signing your training record. They will keep a copy of your training on file for review.**

Specific Training that includes such topics as:

- **Emergency Action Plan and fire safety**
- **Area specific policies and procedures**
- **Area specific MSDS and chemical information**
- **Use and limitations of personal protective equipment (PPE)**
- **Chemical Hygiene Plan training (required for laboratories)**
- **Chemical Spill Training (required for persons who clean up laboratory spills)**
- **Hazardous Waste Accumulation Training (required for waste accumulation areas)**

- **Other department requirements**

NOTE: This training is required upon initial assignment and must be updated annually or when new hazards arise. If you have questions, contact your supervisor.

3. Supervisor Safety Training

Some graduate student employees will be working in areas that require they supervisor other employees or students. If you are going to supervise others you must have Supervisor Safety Training: <https://sem.umaine.edu/department-annual-safety-training/>. This will provide you with many of the tools you need to meet many of the required safety and environmental program requirements. Visit the Safety and Environmental website to schedule training.

3. Other Specialized Safety Training

Some graduate student employees will be working in areas that require additional specialized training. You should ask your supervisor if any of the following tasks and/or equipment apply to your job (Examples) : Boat Safety, Blood borne Pathogens, Crowd Manager, Hearing Conservation, Fall Protection, Farm Safety, Fieldwork Safety, First Aid/CPR, Ladder Safety, Laser safety, Powered Industrial Trucks, Radiation safety, Respiratory Protection, etc.

NOTE: PLEASE MAKE SURE YOU BRING A COPY OF THIS FACT SHEET AND YOUR ONLINE TRAINING RECORD TO YOUR SUPERVISOR. IF YOU HAVE QUESTIONS CONTACT THE SAFETY AND ENVIRONMENTAL MANAGEMENT OFFICE AT 581-4055.

APPENDIX 5
Department of Wildlife, Fisheries, and Conservation Biology
Annual Review of Safety Training

Supervisors must provide Department Annual Emergency Action Plan to all employees.
This form will be maintained by the Department as documentation of training.

Employee Name (*print*) _____ Date _____

Employee (*signature*) _____

*Faculty Supervisor Name (*print*) _____

*Faculty Supervisor (*signature*) _____

Employee Training Items

1. Review all potential hazards including, but not limited to:

- Physical (noise, moving machinery, hot surfaces, electrical, working from heights, ladders, slipping, falling, moving vehicles/equipment, sharp objects);
- Chemical (gases, liquids, flammables, toxics, corrosives, poisons);
- Ergonomics (repetitive motion, extreme heat/cold, lifting, vibrations, awkward positions);
- Biological (blood, bacteria, viruses);
- Hidden hazards (i.e. asbestos, lead, underground utilities)

2. If employee uses Personal Protective Equipment (PPE)

- Discuss the job tasks that require the use of PPE
- Location and availability of PPE and PPE assessment forms
- Is the PPE adequate and serviceable?

3. Emergency Action Plans

- Location of the Emergency Action Plan
- Evacuation procedures, fire alarms, and rally point information
- Indicate who is designated and trained to use a fire extinguisher
- Indicate who is designated and trained to be the emergency evacuation coordinator

4. If employee uses Chemicals*

- Location and availability of Material Safety Data Sheets (MSDS) within the work area
- Discuss any changes in the chemicals used or precautions required since previous training
- Ensure that hazardous chemical training has been completed for all hazardous chemicals unless covered by a current Chemical Hygiene Plan (CHP)

- Discuss any changes to the Chemical Hygiene Plan, for chemicals covered by a CHP
 - Indicate who is designated and trained to clean up hazardous chemical spills
 - How to obtain and use available hazard information (e.g. MSDSs)
-

***A faculty member must sign the training form and review employee use of chemicals. These tasks may not be assigned to graduate students who supervise employees.**

APPENDIX 6
**EMERGENCY ACTION PLAN:
WILDLIFE, FISHERIES, and CONSERVATION BIOLOGY**

Background

The major hazards within **Nutting Hall** are:

Fire	entire building
Chemical Spill	entire building

The evacuation alarm is sounded with a Bell

Emergency Procedures

In the event that you:

1. Discover a fire or chemical spill emergency;
2. Smell smoke or the odor of burning or abnormally hot material; or
3. The alarm is sounded.

You shall:

1. Verbally warn others in the area
2. Activate the Fire Alarm system (Pull stations near the exits)
3. If your workspace is not currently involved and you can do so safely: shut windows and close the door tightly behind you as you leave.
4. Evacuate the building; **do not use an elevator**, conducting a minimal sweep for visitors and students on the way out.
5. If you discovered the fire or chemical spill emergency **Call 911** from a safe place [**911 on UMaine phones reaches Public Safety on campus; if using a cell phone, dial 581-4040**]
6. Assemble at the rally point and account for all employees.
7. Brief the Fire Department of concerns upon their arrival.
8. Remain outside of the building until the 'all clear' is given by the authorities.

Exit Pathways (see area-specific building map)

Rally Points

- The Rally Point is the **Northwest corner of the parking lot behind Nutting Hall** in good weather and the **Lobby of Hitchner Hall** in inclement weather.
- At the Rally Point, an accounting of employees will be taken by:

- Dan Harrison, Chairperson
- Acting Chairperson, or most senior staff person available.
- If any people cannot be accounted for, inform the Emergency Responders.

Employees authorized to remain behind to operate or shut down critical operations

NONE

Use of Emergency Equipment

Although it is policy to evacuate in case of a fire, circumstances may dictate that a fire extinguisher is needed. **DO NOT** use a fire extinguisher unless:

1. You have been trained in the **Hands-on** use of a fire extinguisher within the last year;
2. You are able to put out the fire without endangering yourself or others;
3. You have an open path of escape at all times.

Personal Injury Emergency Procedures

In the event that:

1. You are injured;
2. Come upon an injured person;
3. Encounter what you suspect to be blood or other bodily fluids.

You shall:

1. Call **911** and inform them what has happened;
2. If the victim is other than yourself administer first aid only if you have been trained and are using the proper personal protective equipment.
3. If the situation involves suspected blood or other bodily fluids and no victim, still call **911** and inform the dispatcher (**Do not attempt a clean-up on your own**).

Prevention / Follow-up

- Periodic safety audits will be conducted by the employees and Safety Coordinator reducing risks of hazards within the work spaces.
- Once the emergency situation has been mitigated, an incident investigation will be completed, and corrective measures will be implemented to prevent future recurrence of the problem.
- If an injury is involved, then file a first report of injury with Human Resources.

Implementation and Maintenance

- This plan will be reviewed and exercised when the plan is first implemented, with newly hired employees, when changes necessitate, or at least once a year.
- Training will consist of providing a copy of the Emergency Action Plan and evacuation map to the employee, explaining procedures, walking through an evacuation, and answering any questions the employee has.
- Annual evacuation drills also will be conducted
- The person responsible for updating and training this Emergency Action Plan is Daniel Harrison, Safety Coordinator.

Further information on Emergency Actions

- Call Safety and Environmental Management (Mike Sauda 949-4901 (cell), 581-3037 (office); Wayne Maines 949-2254 (cell), 581-4055 (office)).