Colby College Laboratory Safety Plan (LSP)
STUDENTS
IN THE CASE OF AN EMERGENCY:

- If you are in immediate danger, such as a fire or large chemical spill, pull the fire alarm, evacuate the area and building, and call Security at Extension 5911 (mobile phone at 859-5911), from a safe location. Locate the members of your lab personnel outside at a prearranged meeting space.
- Notify your instructor or supervisor if not in immediate danger. Phone numbers for people responsible for the room are listed on the door signs outside of each lab. DO NOT LEAVE THE AREA UNTIL HELP ARRIVES.
- Never attempt to handle an emergency or a spill. Notify the responsible PI, and Security at extension 5911 (859-5911 from a mobile phone).
- DO NOT attempt to handle any unplanned or emergency situations that make you feel uncomfortable and put you at risk. Please evacuate the area and call for immediate assistance (use information on door signs).
- When the Health Center (HC) is open (classes are in session), all students with minor/moderate injuries should go to the HC for evaluations. The HC is open 8-8 Monday-Friday and 12-8 Saturday-Sunday.
- After hours or for more serious injuries, students should go to the ER for evaluation, either transported by Security or if necessary by City ambulance.
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1.0 PURPOSE

1.1 The Laboratory Safety Plan (LSP) has been drafted as a general guidance document listing the universal safety requirements needed to work in any Colby science laboratory. The LSP complies with the requirements of OSHA’s Laboratory Safety Standard, 29 CFR 1910.1450.

2.0 SCOPE

2.1 The requirements of the LSP apply to all faculty, staff, students, and student employees that work in the laboratory facilities at Colby College. The primary Colby Divisions that fall under the scope of this plan include the: Natural Sciences Division, Interdisciplinary Studies Division (Environmental Studies Program), and the Social Sciences Division.

3.0 REFERENCE DOCUMENTS

3.2. OSHA, Occupational Exposure to Hazardous Chemicals in Laboratories, 29 CFR 1910.1450
3.3. Laser Safety Manual (LSM)
3.4. Colby College Hazardous Communication Program

4.0 DEFINITIONS

4.1 Cryogenic liquids: Materials with boiling points of less than -73°C (-100°F). This includes liquid nitrogen, helium, oxygen, hydrogen and argon. A slush mixture of dry ice with isopropanol is a common cryogen used at Colby College.

4.2 Ethidium Bromide (EtBr): A commonly used stain for the visualization of nucleic acids in agarose gels. It is a mutagen. It is widely used by scientists due to its high sensitivity, rapid staining and low cost.

4.3 First Aid: For the sake of this program, first aid is considered to be cursory initial injury treatment typically performed by the injured party or the first responder at the scene of the accident in an effort to stabilize the victim to travel to the Health Center or Emergency Room for medical care.

4.4 Hazardous Waste Storage Area (HWSA): Once hazardous waste accumulation containers are full, they are transferred to the HWSA prior to offsite disposal by a third party licensed vendor.

4.5 Independent Work: Students are considered to be working independently anytime they are working in a lab alone or with other students only, outside of the scope of a supervised scheduled course.

4.6 Safety Data Sheet (SDS): Chemical and hazardous material information sheets specifying chemical hazards, in compliance with the OSHA Hazardous Communications Standard.

4.7 Personal Protective Equipment (PPE): Protective clothing or gear used by individuals to protect laboratory personnel from various physical, chemical and other hazards.
4.8 **Facilities Services**: Colby College’s facility maintenance department (formerly PPD).

4.9 **Satellite Accumulation Area (SAA)**: Accumulation areas for specific hazardous waste streams.

4.10 **Secondary Container**: Any chemical container being used beyond the original manufacturer's bottle/container that that the material was originally shipped in. This may include, but is not limited to: portable or day containers, flasks, beakers, or small storage bottles.

5.0 **RESPONSIBILITIES**

*Responsibilities for oversight, implementation and maintenance of the LSP are assigned below. Identified personnel may designate tasks assigned to them to a qualified employee, student or consultant, as appropriate.*

5.1 **Dean of Faculty**:
- The Dean of Faculty offices will oversee, support, and enforce the terms of the LSP,
- Meet with the faculty members to discuss and correct the cited violations included in annual and other lab inspection reports,
- The administration will maintain representation on the Lab Safety Committee,
- The administration will provide budgetary support to ensure health and safety campus wide,
- Notify the CHO when new faculty are hired for orientation training,
- Receive, review and reply to reports submitted by the CHO on the status of the program.

5.2 **Environmental, Health, and Safety (EHS) Director**
- Review, create, and revise safety rules and Colby polices based on risk assessments, incidents, general practices, and near misses,
- Review and revise the LSP at a minimum on an annual basis,
- Coordinate and chair the Lab Safety Committee (LSC),
- Conduct annual inspections of laboratories with the CHO and department safety coordinators,
- Maintain records including inspection forms, training logs, spill reports, accident reports, safety data sheets, and inventory records,
- Back-up the CHO and assist as needed with daily tasks and emergency response.

5.3 **Chemical Hygiene Officer (CHO)**:
*The Academic Environmental Safety Specialist will act as the CHO for the College.*

*Responsibilities of the CHO include the following:*
- Work with each academic department to manage the day-to-day EHS activities and to ensure that the College complies with applicable regulations and lab safety programs,
- Serve on the Lab Safety Committee,
- Oversee the academic chemical inventory and MSDSonline database, as well as product and hazardous waste storage areas,
• Conduct annual inspections of laboratories and submit the results to the Department chairs,
• Complete regulatory required inspections such as weekly hazardous waste inspections, monthly eyewash and shower checks, and spill kit checks,
• Act as the primary emergency contact and responder for the academic areas.

5.4 Departmental Chairperson:
The department chairperson will assume overall responsibility for communicating the requirements/revisions of the LSP to the department faculty. Additional responsibilities of the department chairperson include the following:
• Provide budgetary support to ensure compliance including adequate personal protective equipment and third party training if required for department specific activities,
• Serve on the LSC,
• Notify the CHO six months prior to a faculty member leaving the department,
• Appoint a Departmental Safety Coordinator,
• Relay LSC decisions to their department.

5.4 Lab Safety Committee (LSC):
Members of the LSC will meet at least annually. The LSC will include the Department Chairperson and/or Department Safety Coordinator, the CHO, and a representative from the Dean of Faculty. Responsibilities of the LSC include:
• Review spill, accident, and inspection reports,
• Discuss campus wide laboratory safety issues and make recommendations to the EHS Director and CHO for revisions/improvements to the LSP,
• Assist in resolving any noncompliance issues.

5.5 Principal Investigator (PI)/ Laboratory Supervisor:
• The PIs/staff members will support the EHS Director, CHO, and department chairs in the implementation of the LSP,
• Maintain a positive attitude towards safety requirements and set a good example to lab personnel by following safety rules and wearing proper personal protective equipment,
• Ensure that all personnel are properly supervised or safety trained before they work in the laboratory,
• Ensure that all personnel comply with the LSP requirements at all times,
• Provide appropriate personal protective equipment compatible with the hazards specific to the laboratory,
• Review and understand safety procedures specific to their laboratory,
• Assume responsibility for laboratory visitors,
• Properly characterize and manage all waste generated in their labs,
• Complete Spill and Accident Report Forms for incidents in their labs,
• Contact appropriate personnel to report problems with laboratory facilities and work directly with the CHO or Departmental Chairperson to ensure laboratory
compliance. Students shall not be used to communicate EHS issues between faculty and staff.

5.6 **Departmental Safety Coordinator:**
*The Departmental Safety Coordinator will act as a liaison between the department(s), CHO, and the Safety Committee. The Departmental Safety Coordinator will:*
- Work with the departmental chairperson to ensure compliance with the LSP
- Serve on the Lab Safety Committee.

5.7 **Laboratory Personnel (includes faculty, staff and students):**
- All laboratory personnel will read, understand and follow all safety rules and regulations that apply to the workplace,
- Complete safety training by the CHO or the Departmental Safety Coordinator and sign a safety agreement that assures that they understand and agree to follow the LSP,
- Comply with specific behavior outlined in the LSP including the wearing of the appropriate personal protective equipment at all times, good housekeeping practices, proper laboratory conduct, and the immediate communication of any spills, illnesses, and accidents.

5.8 **Facilities Services Personnel:**
- All Facilities members who work or may work in any laboratory or studio will be trained by the EHS Director on LSP awareness and will obtain information about the workplace before any work is started.
- All Facilities personnel will refuse to enter or render services to any laboratory in an unsafe condition and will report findings to their immediate supervisor.

6.0 **LAB SAFETY REQUIREMENTS**
*The following includes basic guidelines for maintaining a safe working environment in all laboratories at Colby College.*

6.1 **General Lab Safety Requirements:**
6.1.1 Students are not permitted to work alone in Colby labs while using hazardous materials or performing hazardous procedures. Select Departments may allow trained students to work alone conducting hazardous work in the labs, provided the students comply with the risk minimization procedures and requirements listed in Section 13, Department Specific Requirements.

6.1.2 If a student wishes to study and/or work in a laboratory where no hazardous substance or procedure is involved, the student may do so at any hour of the day without a partner, but the student must abide by the general safety rules outlined in this plan.

6.1.3 Personnel are not permitted to play loud music or wear headphones/earbuds while working while working with hazardous materials or processes in the laboratory.

6.1.4 No pets are permitted in the laboratory.

6.1.5 Visitors are permitted in the laboratory as long as they are wearing the correct PPE and escorted by trained authorized personnel. Visitors must be trained and
have signed the Lab Safety Training Acknowledgement before being allowed to work in the laboratory independently.

6.1.6 Minors, not enrolled at Colby, are permitted in the laboratory only when involved in educational or classroom activities. Minors in Colby’s labs must be supervised in person at all times. Trained, enrolled Colby students may supervise minors, provided that they are not conducting hazardous reactions or working with high risk equipment or chemicals. When working with high risk applications, the PI must be in the lab at all times. The departmental chairperson must be notified of all activities involving minors. Before minors may work in a Colby lab, the CHO must also be notified, approve, and provide individual training for the students.

6.1.7 Students must use extreme caution when conducting new experiments or procedures. Experiments and reactions not authorized by the faculty in charge of the lab are not permitted.

6.1.8 Students must be trained by a faculty member before working independently (limited supervision) with a new chemical, procedure, or equipment.

6.1.9 The standard operating procedures must be followed at all times. Any potential change to the SOP must be discussed with a faculty member before proceeding.

6.1.10 Lab personnel must carefully inspect all equipment and instrumentation before use.

6.1.11 Lab personnel must know the location of all the safety equipment and the spill kit in their workspace and how to use it properly before working independently in the lab.

6.2 Requirements for Personal Protective Equipment:

6.2.1 Appropriate eye protection (ANSI Z87.1 approved googles or safety glasses) must be worn whenever working with a hazardous substance or procedure. Examples of hazardous substances include solvents, corrosives, or toxic liquids. UV and laser specific protective goggles are also available.

6.2.2 Always wear appropriate footwear. Bare feet, open toed shoes, sandals, or high-heeled shoes are not allowed.

6.2.3 Wear gloves if physical or chemical contact hazards are present. No single glove material provides effective protection for all uses. Review the MSDS/SDS to determine if the type of glove is compatible with the chemicals you are using. In addition, always inspect the gloves for rips and tears before use. Do not use expired gloves. Common glove applications in Colby labs includes the following:

- Nitrile gloves for chemical hazards.
- Use insulated gloves (Kevlar) for hot materials or broken glass.
- Use cryogloves for extra cold materials such as liquid nitrogen, dry ice etc.
- Always don Kevlar or leather when cutting or breaking glass.
- Wear two pairs of gloves (double glove) when extra protection is necessary.

** In select circumstances the use of gloves may not be practical or safe. This may include working around powders in high static low humidity environments or around rotating tools. It is at the discretion of the PI to determine when gloves should not be worn.
6.2.4 Gloves must be removed before exiting the workplace, handling a doorknob or phone, using instrumentation or a computer, etc. The gloves should never be disposed of in the hallway waste receptacle. Put new gloves on when you return to work. If you must use a glove for protection while moving hazardous materials to a different location, etc., take one glove off and use the bare hand to manipulate the doorknob, and carry the material in the gloved hand.

6.2.5 The use of lab coats or aprons is recommended but not required when working with low hazard materials. The use of lab coat or apron does provide an additional protective layer against a spill or burn and is required when working with highly hazardous chemicals such as pyrophoric compounds, concentrated acids and/or concentrated bases, and highly toxic liquids (hydrofluoric acid).

6.3 Requirements for Personal Hygiene:

6.3.1 Eating, drinking (including water), chewing gum, applying makeup or lip balm and smoking are prohibited in laboratories or storage areas. Never store food or drinks for human consumption in a lab freezer or refrigerator. Do not place any food or drink cups in the laboratory trash. Always use a hallway waste receptacle. Food and drink may be placed outside of the lab door if necessary.

6.3.2 Never touch your face when working in the laboratory, especially when wearing gloves.

6.3.3 Always wash your hands before leaving the laboratory or studio if there was any possibility of chemical contact.

6.3.4 Mouth suctioning to pipette anything is never permitted. Always use a pipet bulb or pump.

6.3.5 Do not wear loose clothing or hanging jewelry. Tie long hair back when working in a laboratory.

6.3.6 Wear appropriate clothing in a laboratory. Proper clothing will provide a degree of protection in the case of a splash or spill. Exposed skin is always at risk. Shorts, halter tops, sleeveless shirts and “belly shirts” all increase potential skin exposure.

6.4 Housekeeping Requirements in the Lab:

6.4.1 Use of extension cords is prohibited for powering fixed equipment and large appliances. Extension cords may be used to power portable equipment on a temporary basis.

6.4.2 Access to emergency equipment, showers, eyewashes, exits, and spill kits must never be blocked. In addition, keep all fire lanes free of equipment.

6.4.3 Unless designated, fume hoods, bench tops and floors are not to be used for long term chemical storage. Return materials to their proper storage place when not in use.

6.4.4 All laboratory waste must be properly disposed of at the end of each day by either transferring to an SAA container or the HWSA.

6.5 Equipment Specific Lab Safety Requirements:

6.5.1 Laboratory Chemical Hoods: Laboratory chemical hoods are one of the most important components used to protect personnel from exposure to hazardous
chemicals and other harmful agents. The hoods are inspected by Facilities Services twice a year to verify proper function.

- Ensure the hood exhaust fan is on and keep it on at all times when working with hazardous substances.
- If possible, always use the hood sash at the designated position (found on the front face of the hood). This assures proper face velocity. Work is performed by extending the arms under the sash while keeping the head outside of the sash. Always attempt to keep the sash between the person and the hazard.
- To reduce turbulence and reduction of air flow, move the sash up and down slowly and avoid rapid body movement when in front of the hood.
- Work at least six inches inside of the hood (behind the face). This assures that the highest concentration of the contaminant is away from the face of the person and the hood. Place equipment as far back as possible but do not block the back baffle.
- Use racks to support any equipment used in the hood. Avoid using large pieces of equipment in the hood that can block or disrupt airflow.
- Never modify a hood in any way to adversely affect its performance.
- Never use a hood if the safety alarm is sounding. Notify your supervisor or responsible faculty member to submit a work order to Facilities Services to have the hood repaired.
- Never use a hood for chemical storage unless specifically labeled for that use.
- When leaving reactions unattended in the hood, be sure that the equipment is secured and the hood is well labeled with specific details regarding the chemicals involved and your contact information.
- Certain hoods are designated for special use and have been modified for the specific hazard. Please use these hoods when necessary and try not to use them for general use. Examples of specific hoods at Colby are mutagen hoods (for the use of mutagenic chemicals such as ethidium bromide and acrylamide), Hydrofluoric acid hoods that have special modifications for HF fumes (corrosive and toxic), the perchloric acid wash down hood (Mudd 412 only), heat transfer hoods (used to pull heat away from instrumentation such as the AA, ICP, CHO), cell culture hoods for tissue culture, and laminar flow hoods that maintain sterile environments (biohazards).

6.5.2 **Vacuum Safety:** Vacuum work can result in implosions. Careful set up and operation are important to reduce the chance of flying glass, spattering chemicals, and fire. It is imperative that safety glasses be worn at all times when operating vacuum equipment. The use of a fume hood is also highly recommended when working with vacuums. If a hood is not used, it is recommended that a face shield also be worn over safety glasses.

- Know how to properly set up and operate the vacuum system in use. Always use good support to reduce the strain on the necks of the glassware. Vent the system slowly and completely before disassembling.
• Use a trap to avoid water, solvents and corrosive gasses from entering the system. Avoid water aspiration. Pressurization hazards can be avoided with the use of a bubbler.
• Take proper care of the vacuum pump. Use traps and clean the oil often. Notify your supervisor or Facilities Services if the pump is leaking oil. Clean, used oil is a non-hazardous waste but must be labeled as such and disposed of in Keyes Room #004. Do not put oil down the sink or into the general trash. Contaminated oil (solvents, mercury, corrosive substances, etc.) is a hazardous waste.
• Before use, check for flaws in the glassware by holding it to the light. Use only glassware suitable for subambient pressure. Pyrex/Kimax glass is recommended.
• Never carry or move an evacuated vessel (dessicators, flasks, etc.)

6.6 Chemical Specific Safety Requirements:
6.6.1 Chemical Specific Safety Fact Sheets
• Will be developed by the CHO as needed to address high risk chemicals used frequently by students.
  • Fact sheets are posted where the chemicals are commonly used and will be maintained on the Academic Safety webpage (http://www.colby.edu/humanresources/academic-safety-programs/).

6.6.2 Peroxide Forming Chemicals
• Select solvents used in Colby labs have the potential to form unstable potentially explosive peroxides over time and require special monitoring to ensure the chemical remains safe to use.
• A Peroxide Former Standard Operating Procedure (SOP) has been developed to systematically monitor all peroxide forming solvents at Colby. The SOP is attached as Appendix H.

6.6.3 Hydrofluoric Acid (HF)
• HF can cause severe systemic toxicity from even relatively small exposures. Use of HF by students is only allowed when actively supervised by the lab PI.
• The PI must ensure that proper PPE is available for their staff and students.
• Required PPE includes: chemical splash googles, face shield, forearm length 14 mil nitrile gloves, lab coat, and rubber apron.
• Ensure that students and staff know the location of the HF Treatment Kit and always check the expiration date of the calcium gluconate antidote before conducting procedures using HF.
• HF exposure response procedures are listed in Section 10.2.4.
7.0 REQUIREMENTS FOR CHEMICAL LABELING, TRANSPORT AND STORAGE

7.1 Chemical Labeling Requirements:

7.1.1 Primary containers must have an intact label as printed by the manufacturer. If the label has become damaged or missing on usable chemicals, review the SDS to determine the correct language and re-label the container.

7.1.2 Secondary containers used for long-term storage in laboratories must be marked with the product name, date, and responsible personnel. Completing the NFPA diamond is optional and recommended for larger (liter or greater) secondary containers.

7.1.3 Single use day containers under the control of the laboratory personal using the container do not have to be labeled.

7.1.4 Area placards may be used to label small containers or large quantities non-hazardous samples (i.e., water samples). Placards shall contain the material name, date, and responsible lab personnel.

7.2 General Chemical Transport and Storage Requirements:

7.2.1 The following lists general chemical storage and transporting requirements for all Colby labs:

• Avoid storing chemicals on shelves higher than 5 feet (above eye level). If, due to space constraints, chemicals must be stored on high shelves, avoid overreaching and always use a stepstool to access the materials.

• Store heavier materials on lower shelves.

• Keep egress routes, passageways, areas under tables, and emergency equipment free of stored materials.

• Provide a defined storage area for each hazard class. Observe all precautions regarding incompatible chemicals. Put the chemical back in the proper storage area when no longer needed.

• Ventilated spaces should be used for volatile, toxic and/or odiferous chemicals.

• Store chemicals in a labeled, closeable cabinet or on a labeled shelf. Flammables should always be stored in an approved flammable liquid cabinet or in flammable and/or explosion proof refrigerators.

• Use secondary containment (polypropylene trays and dishpans, and/or corrosion resistant storage trays) to catch spills, leaks, drips etc.

• Never store chemicals in a hood, on the floor, or on a bench top. Always put chemicals away at the end of the day.

• Do not store chemicals in direct heat or light.

• Dispose of old and/or expired chemicals, bottles with worn or missing labels, bottles with missing or broken caps, and bottles with any type of leakage including smell.
• Use appropriate carts, plastic carriers, and PPE when transporting chemicals. If you borrow a cart or a carrier from any of the stockrooms, return it as soon as possible.

• Use appropriate carts for transporting gas cylinders. Always use the chain to support the gas cylinder on the cart. Be sure that the cylinders are always stored and used in the upright position and securely fastened to the wall or bench top using a belt or chain support. Due to potential leaks, do not accompany a cylinder in the elevators.

• Always use the proper regulator. Regulators are gas specific.

• Store empty gas cylinders with the cap on, in the upright position. They must be securely fastened using a belt or chain, even when in a cage. All cylinders must be tagged “EMPTY, IN USE, or FULL”.

• NFPA Standard 45 (NFPA, 2004) limits the quantity of flammables and combustibles in the workspace based on room design, fire control, location in the building, fire control systems, flammable storage design and the type of laboratory or studio (academic, research, industrial, etc.). Colby is allowed by NFPA 45 to store up to one 20-liter drum of solvent on the floor of any laboratory.

7.3 Chemical Inventory Process:

7.3.1 MSDS Online is used to track chemical containers using QR coded labels and a mobile application for smart phones and tablets. Chemical containers smaller than 25 g/ml are not tracked in the inventory system. The following steps are used to maintain the inventory:

• The CHO, or a designated person in each Department adds newly purchased chemicals to the inventory, and QR code labels are created and placed on the containers.

• Peroxide forming compounds must be labeled with a green or orange peroxide former warning label as outlined in Peroxide Former Standard Operating Procedure (SOP) found in Appendix H, and need to be added to the peroxide former “group” in the online inventory for improved tracking.

• SDS/Chem Management mobile application is used to scan the QR coded labels to track the location of the container.

• When empty, place clean containers in blue inventory removal bins located near SAA locations.

• The CHO will scan and remove the container from the inventory and the containers are added to the single stream recycling.

• Annual inventory reconciliations are conducted during the summer by the CHO.
8.0 WASTE MANAGEMENT

8.1 Types of Laboratory Waste:

Lab waste may fall into a number of different categories and management requirements. It is the responsibility of the faculty member who oversees the laboratory to properly characterize and manage the waste generated in their labs.

8.1.1 Laboratory waste will fall under one or more of the following categories.

- Solid waste (trash and debris)
- Hazardous waste
- Universal waste
- Radioactive waste
- Biomedical waste

8.2 Hazardous Waste:

8.2.1 Per Federal and States laws, the properties of hazardous waste are defined as any substance that exhibits one or more of the following hazardous characteristics:

- IGNITABILITY (flash point less than 140F),
- CORROSIVE (pH less than 2 or greater than 12.5),
- REACTIVITY (reactive to water, shock, heat, pressure, or gives off toxic gases, or unstable and reacts rapidly or explosively), and/or
- TOXICITY (that which will leach more than a specified amount of heavy metals, pesticides, and carcinogens/mutagens).

8.2.2 Broken mercury thermometers do not go into the general trash, glass waste, or sharps waste. Place broken mercury thermometers in the designated container located in a Satellite Accumulation Area (SAA). Mercury is a toxic heavy metal and is a hazardous waste. Non-mercury thermometers (these have red, blue or green nontoxic liquid) can be disposed of in a glass waste container. Do not put non-mercury thermometers in the general trash.

8.2.3 If you find a waste at your site that has no product information, please contact the CHO. Do not assume that the waste is nonhazardous. The SDS, bottle label, and manufacturer’s information are also resources in determining if the laboratory waste is a waste is hazardous.

8.2.4 Hazardous waste must be accumulated/stored in a Satellite Accumulation Area (SAA) for disposal to the Hazardous Waste Storage Room in Keyes Room 4 by the CHO.

8.2.4.1 There are many SAAs on campus listed in Appendix 2. A waste generator must use the SAA near where the waste is generated. The SAAs are clearly labeled and are monitored weekly for proper use. Each SAA has reminder sheets for waste identification, proper use, and separation based on incompatibilities.

8.2.4.2 Guidelines for safe use of a SAA include the following:

- Choose an SAA near your work area. Do not attempt to carry hazardous waste unlabeled, uncovered, without secondary containment, or over long distances.
• Use proper personal protective equipment. Glasses are required and gloves are highly recommended.
• Choose the properly labeled waste container that suits your hazardous waste; if there is a compatibility issue, you must use a different SAA.
• You can move this container under a nearby hood to transfer the waste if it is difficult to use the SAA due to space constraints. After transferring the waste, always put the waste container immediately back into the SAA area.
• Check to see that the container is not leaking, bulging, etc.
• Remove the lid and use a funnel to add your waste. Spilling solvents will make the label illegible and potentially result in mixing of incompatible waste. When complete, replace the lid and make sure that it is secure.
• For mercury spills, a separate mercury waste container can be found in most SAAs. Place the mercury metal under the water in the container to contain mercury vapors. Liquid mercury spills are also added to the water. The containers are pre-labeled for mercury waste. Broken thermometers small enough to fit, may be placed directly in the container. A sealed, labeled plastic bag can also be used if the thermometer cannot fit in the special SAA container.
• Ethidium bromide (EtBr), acrylamide liquid, and solid hazardous waste should be collected in a separate container in all SAAs near any workspace that uses these mutagens. An EtBr spill kit must be included in the workspace to ensure proper cleanup.
• Any chemical, buffer, or reagent mixture than has several known incompatibilities can have its own waste container (if room in the SAA allows). Contact the CHO to add a SAA container.
• If a waste container becomes full and additional space is needed immediately, contact the CHO to replace the container before the weekly inspection.

8.3 Universal Waste:
8.3.1 Universal waste is a specific sub-category of hazardous waste primarily related to waste generated during building maintenance and not typically generated by lab personnel. Examples include fluorescent lamps and certain types of heavy metal batteries.

8.4 Biomedical and Radioactive Waste:
8.4.1 The disposal of radioactive and biohazard wastes will not be addressed in the LSP. Contact the CHO for information about radioactive and biohazard waste.

8.5 Sharps:
8.5.1 Needles and scalpels must never be put in the general trash. All sharps must be disposed of in a designated sharps container in every lab and prep room. If the container has a biohazard label included by the manufacturer, remove or cross off
the biohazard information. Syringes that do not contain any hazardous materials may be put in the general trash. When full, the sharps container must be closed securely and placed in the waste room, Keyes 004, for disposal. This does not include syringes and sharps contaminated with biohazards or radioactive materials, which must be managed specifically as biohazard or radioactive waste. Please see the CHO if you need a sharps container.

8.6 Solid Waste:

8.6.1 Every SAA location has a solid waste container for solid nonhazardous chemical waste. No chemicals should ever be placed in the general trash. Used filter paper and silica gel must not be treated as solid waste if it contains excess chemicals.

8.6.2 Empty Bottles and Containers:
- Air out empty flammable solvent bottles or odiferous containers under a hood before disposal or recycling.
- It is recommended that the labels are removed or crossed out using permanent marker before using the trash.
- Only use the general trash receptacle inside the workspace.
- If the bottle is damaged or broken, use the glass waste receptacle. Do not place in the general trash. The broken glass should never contain any amount of hazardous chemicals that could lead to irritating odors or volatile fumes. When the glass trash container is full, please close, secure the lid with tape, and label as trash. Properly labeled secured glass boxes may be put into the dumpsters.
- Recycling an empty container is highly recommended.

8.6.3 Ethidium Bromide containers:
- Filter the aqueous EtBr waste solutions (free of other contaminants) through a bed of activated charcoal. The filtrate may be poured down the drain. Place the used charcoal in a sealed container and label as a hazardous waste. A special EtBr liquid and solid waste container should be included in every SAA near any workspace that uses this mutagen.
- Trace amounts of EtBr (less than 0.1%) in electrophoresis gels do not pose a serious hazard so they can be discarded in the trash if properly bagged and secured. If the gels contain more than 0.1% EtBr they should be placed in an appropriate container for hazardous waste disposal. Aqueous Solutions can be decontaminated or deactivated using charcoal filtration. An EtBr Spill Kit should be kept near any workspace that uses this mutagen.

9.0 HAZARD COMMUNICATION

9.1 Door Signs:

9.1.1 Outside of each laboratory or studio door there must be a list of the contact personnel for that workspace and GHS pictograms showing the hazards located in that room. This information is essential in the case of an emergency. Please be familiar with the hazards in your lab. Appendix 3 details each GHS pictogram and related hazards.
9.1.2 Select departments will also have Hazard Identification forms (HIF) and Standard Operating Procedures (SOP) that will further aid in the identification of hazardous materials and/or procedures specific to that workspace. These forms are included in the package so that emergency personnel unfamiliar to the workspace can readily identify what hazards are present and where the hazards are located in the workspace before they enter the room. The HIF will identify the specific hazard and the location of each. The SOP will identify a specific hazard and/or procedure and how to best respond to that particular hazard.

9.1.3 All door signage, HIFs, and SOPs are reviewed and updated annually to ensure that the information is correct and current.

9.2 Safety Data Sheets (SDS):
9.2.1 SDS are the primary source of information regarding a chemical’s properties, hazards, proper handling, and storage.
9.2.2 Colby College maintains a subscription to MSDSonline an online database with all of the College’s hazardous materials.
9.2.3 All students, staff, and faculty have access to MSDSonline through the College’s EHS Website and the MyColby homepage. Note, you must be logged in to have access to the link.
9.2.4 The College’s Hazardous Communication Program (Reference Document 3.7) details how to access the database and add new materials.

10.0 LABORATORY EMERGENCIES

10.1 General Guidelines:
• If you cannot assess the conditions well enough to be sure of your own safety, do not enter the area. Call emergency personnel and describe the situation as best you can.
• In the event of an accident, do not leave the area until reporting the accident to a faculty member or Security.
• A written spill (Appendix E) and accident report (Appendix F) must be submitted to the CHO following the verbal report within 24 hours.
• All laboratory and studio personnel should know what to do in the case of an injury, spill, fire, accident, and any other emergency specific to that workplace. No one should start to work until they know the location of and how to operate the emergency equipment, the location of available exits, their role in emergency response, and how to report the emergency to summon help.
• When the Health Center (HC) is open, all minor/moderate student injuries should go to the HC for evaluations. The HC is open 8-8 Monday-Friday and 12-8 Saturday-Sunday.
• Injury victims must always be accompanied by Faculty, other students, or Security when traveling to the Health Center or local hospital.

10.2 Chemical Injury Response:
10.2.1 General treatment of contaminated personnel:
• If an individual is injured or contaminated with a hazardous substance, the responder must tend to that individual before implementing spill control. If
possible, obtain information about the materials being used and provide copies of the SDS to the Health Center or other medical provider.

- For small areas of skin, immediately flush with flowing water for no less than 15 minutes.
- A location list of all emergency eyewash and shower stations is attached as Appendix G. The stations are inspected monthly and documented on tags attached to the units. If an emergency eyewash or shower inspection is not completed in your area, contact the CHO to arrange for completion.
- Immediately call emergency personnel in the case of the ingestion of a hazardous material.

10.2.2 Chemical burns to the eyes: Chemical eye burns result from eye contact with concentrated bases and acids. In the event of a chemical eye burn, the injured person must flush their eyes for 15 minutes in the emergency eyewash. Bystanders must immediately contact Security at 859-5911 to summon emergency assistance.

10.2.2.1 Use of emergency eyewash:

- Pull the valve handle forward which will dislodge the dust caps. The flow of water should be immediate.
- Flush the eyes for no less than 15 minutes. This is not easy for an injured person, so try to hold their eyes into the flow of water by firmly holding the head down for as long as possible.
- Returning the valve handle to its original position will stop the flow of water.
- Resume flushing the eye if pain returns.

10.2.3 Large-scale chemical burns:

10.2.3.1 Use an emergency shower:

- Quickly remove contaminated clothing
- Stand under the shower and pull the handle. The flow of water should be immediate and should last for at least 15 minutes.
- Contact emergency assistance
- Resume if pain returns.
- A fire blanket can be used for privacy if necessary.
- For long-term use, a private shower is available in the basement of Keyes once an initial rinse is completed.

10.2.4 Treatment of Hydrofluoric Acid Contamination: HF can cause severe systemic toxicity from even relatively small dermal exposures. Exposure to this compound should be treated with extreme caution. Treatment involves a calcium or magnesium gluconate antidote that works by combining with HF to form insoluble calcium fluoride, thus preventing the extraction of calcium from tissues and bones. If exposed, seek immediate medical help; successful treatment requires prompt medical treatment.

10.2.4.1 HF skin contact response procedures:
• Call for help immediately and notify Security at Extension 5911 (859-5911 from a mobile phone).
• Remove contaminated clothing immediately.
• Decontaminate by irrigation with copious amounts of water. Flush the affected areas using the safety shower for a minimum of 5 minutes.
• Apply calcium gluconate gel liberally to the affected area and continue to reapply every 5 minutes until professional medical care is provided.
• If the contamination is limited to the fingers then immerse the fingers in a liquid antacid (Equate or Mylanta) after applying the calcium gluconate.
• Place ice packs on the affected area. This will retard the diffusion of the fluoride ion further into the skin.
• Stay with the victim until help arrives.

10.2.4.2 HF eye contact procedures:
• Call for help immediately and notify Security at Extension 5911 (859-5911 from a mobile phone).
• Hold the eyelid open and flush the affected eye (or both eyes) for a minimum of 15 minutes.
• Place ice packs on the affected eye. This will retard the diffusion of the fluoride ion into the eye. Do not use oily drops, ointment, or HF skin burn treatments.
• Stay with the victim until help arrives.

10.2.4.3 HF inhalation response procedures:
• If the area is safe for you to enter, immediately move to fresh air and call for emergency help.

10.2.4.4 HF ingestion response procedures:
• Ingestion of HF is life threatening. Seek immediate medical attention.
• Drink large amounts of water or milk to dilute the acid. Antacids should be administered if medical help is delayed.
• Do not induce vomiting.

10.2.5 Treatment of Ethidium Bromide contamination:
• In the case of eye contact, flush eye(s) with water for at least 15 minutes lifting upper and lower eyelids occasionally.
• If skin is exposed, remove contaminated clothing and wash skin with soap and water immediately.
• If EtBr vapors are inhaled, move to fresh air. If swallowed, get medical attention immediately.

10.3 Physical Injury Response:
10.3.1 In the case of a minor injury, bandages may be used to stabilize the wound, if necessary seek medical attention.
10.3.2 In the event of a minor cut, seek immediate medical attention at the Health Center or local hospital. For a large laceration, immediately contact Security at 5911 (859-5911 from a mobile phone) and remain with the victim.

10.3.3 Immediately call emergency personnel if the injured person appears to be unconscious. Stay with the victim until help arrives.

10.3.4 If the victim is having convulsions, immediately call emergency personnel. If it is safe to enter the area, remove anything from the area that may cause harm to the victim. Stay with the victim until help arrives.

10.3.5 If the victim has a cryogenic burn, immediately call emergency personnel. Do not apply heat. Loosen clothing to promote circulation and flush the area with tepid water to reduce freezing. Stay with the victim until help arrives.

10.4 Spill Response Guidelines:

10.4.1 All personnel who work independently in a laboratory in which hazardous materials are used must be familiar with the location of the spill kit.

10.4.2 All labs with material in the chemical inventory system will be stocked with a small spill kit for incidental or experiment quantity releases.

10.4.3 Larger spill kits for use by the lab instructor or CHO are located in the following areas:
   - Keyes 004 chemical storage room
   - Keyes 121 outside flammable storage
   - Keyes 134 hallway/stairwell
   - Keyes 205 physical chemistry lab
   - Keyes 305 organic chemistry teaching lab
   - Keyes 427 4th floor janitors closet

10.4.2 Students may only assist with the cleanup efforts during spill response if they are familiar with the chemicals involved, comfortable with the quantity spilled, and directly supervised by the lab instructor.

10.4.3 Spill Response Procedure:
   - Always wear the appropriate PPE when responding to a spill.
   - Never respond to a spill alone.
   - Review the SDS if unfamiliar with the chemical before responding.
   - All spills must be documented on Appendix E, Spill Reporting Form and submitted to the CHO as soon as possible.

10.4.4 In the event of a large spill that poses an immediate threat to personal safety and cannot be safely controlled using a spill kit, immediately evacuate the area and any affected nearby areas and call Security (859-5911) and the CHO. Stay nearby until help arrives so that you can report the situation to the emergency personnel.

10.5 Fire Response Guidelines:

10.5.1 Only trained responders are permitted to fight fires at Colby College. In the event of a fire alarm, if possible, stabilize any experiments and exit the building as quickly as possible. Congregate with the other building occupants at a safe
distance from the building. Do not leave the assembly area until told to do so by the responders.

10.5.2 Fire Response Procedures:
- The extinguishers are only to be used by trained personnel in the case of a small containable fire.
- Know your exit routes.
- Know the location of the nearest fire extinguisher, fire alarm-pull station, fire blanket, telephone, emergency contact list, safety showers.

11.0 RECORDS
11.1 Copies of the LSP are located in the CHO’s office, EHS Director’s office, Security office, and on the Colby’s EHS Webpage:
http://www.colby.edu/humanresources/academic-safety-programs/.
11.2 Contact the EHS Director if you need additional records or logs not available online.

12.0 TRAINING
12.1 All laboratory personnel, visitors, visiting faculty and students who will work independently with hazardous materials or equipment are required to be safety trained before starting any laboratory work. At a minimum, all personnel will review, understand and follow all applicable safety rules and regulations that apply to the workplace and sign a safety agreement (Appendix D) that assures that they understand and agree to follow the LSP/DLSP.
12.2 Training for students and visitors (including faculty) who will work independently with hazardous materials or equipment will include the requirements and use of the LSP, SDS, PPE, general safety rules, where emergency equipment is located (safety eye wash, showers, spill kits, first aid etc), chemical management, and emergency procedures for accidents and spills.
12.2.1 The training will be completed in two sections:
- An online Moodle training presentation will cover the general lab safety requirements in the LSP.
- The CHO will provide hands on training following completion of the LSP Moodle.
12.2.2 Additional training may be required for special procedures specific to a laboratory. The PI responsible for that lab will be required to deliver and enforce that training.
12.3 It is the responsibility of the supervising faculty member and designated departmental safety coordinators (where applicable) to identify which students and employees require training.
12.4 Once faculty, staff, and students have completed the safety training (and signed the Laboratory Safety Training Acknowledgement form), it will not be necessary to repeat the entire training for subsequent courses unless there is a change in federal, state, or College safety requirements; however, it will generally be appropriate to
include a “safety training” element at the beginning of each laboratory course to address issues that are specific to that course.

13.0 DEPARTMENTAL SPECIFIC REQUIREMENTS

The following are a list of requirements applied to specific Departmental areas and are not intended for campus wide implementation.

13.1 Biology and Environmental Studies

13.1.1 General Lab Safety Requirements:

- Any students working unsupervised in a teaching or research laboratory must complete the approved online safety Moodle and sign the safety training acknowledgement.
- Research assistants (paid or unpaid), students pursuing independent study, and general or teaching assistants who work after hours doing preparatory work for labs must also complete the Moodle. It is the responsibility of the PI/supervisor to determine if these criteria apply to personnel in their lab.
- Faculty may require and provide additional lab specific training unique to materials and equipment in their lab. Within these requirements faculty will also determine on an individual basis whether students may work alone in the laboratory.
- Additional Laboratory Safety Training Summary (Appendix K) will be administered to introductory biology (BI163L) and introductory ecology (ES271L) students in the fall semester, and may also be used in upper-level laboratories. This training may also include safety policies and protocols specific to a particular course or laboratory.

13.1.2 Fieldwork Specific Safety Requirements:

- Students driving Colby vehicles or rental vehicles for either class or research must be Colby Certified Operators and must adhere to Colby's Fleet Safety Policy. Contact The Safety Office (859-5504) for instructions.
- Students using trailers, whether for transporting boats or other equipment, must complete a safety training course. These courses are usually held annually in June. Contact the PI for more information. PIs may require annual attendance.
- Students operating any of Colby's boats must complete both the online safety training course and attend on-campus training. Training is usually offered annually in June. Contact the PI for more information. PIs may require annual attendance.

13.2 Chemistry Department

13.2.1 Chemistry Faculty/Staff Teaching Laboratory Safety Requirements:

Instructors must be readily available while students are working in teaching laboratories. If an instructor must leave the building or is not readily available to the students in a laboratory, another faculty or teaching staff member must be contacted to cover the laboratory. This policy covers all 100 and 200 level courses and 300 level courses that include non-chemistry
majors. Advanced course laboratories that service only students who have completed laboratory safety training are not subject to this policy, provided the students agree to the "buddy system". The instructor must be available until all of the students have finished working. Working in an office is allowable as long as the students can easily find the instructor in the case of an emergency; however, the instructor must periodically check the students in the lab.

- Departmental safety training and the buddy system is always required for independent research students.
- Student assistants do not qualify to cover a laboratory section in the absence of the faculty or teaching staff member.
- Instructors often work with students in the Instrument lab (Keyes 203). The instructor needs to inform the student assistant and the students that they will be in K203. The student assistant must cover the laboratory until the return of the instructor.
- This policy is necessary to the end of the laboratory section, even if the laboratory runs longer than the scheduled time. Including clean up time, computer, and discussion time. This policy is necessary when not doing wet chemistry if chemicals are readily available anywhere in the lab.
- Quick restroom breaks or brief office trips do not require additional coverage.

13.2.2 Requirements for Independent Study:

- Students are not permitted to work alone in Colby Chemistry labs while using hazardous materials or performing hazardous procedures. A partner must be within earshot, (a minimum of the same building and same floor), and must be aware of what to do in the case of an emergency.
- If no partner is available after hours (between 9 pm and 6 am), authorized students must call Security if they have to work in a Chemistry Department Lab. The dispatcher will note the time of the call, the building and room number, and a phone number where the student is working. The student is required to call Security if they are working longer than 20 minutes and when they are finished and leaving the lab. Security will take appropriate action and attempt to call the student if more than the 20 minutes has elapsed. If the student has left the lab without contacting Security, disciplinary action will be taken and/or after hours work privileges will be revoked. Noncompliant students found working after hours will be asked to leave the building, and the departmental chair will be notified.
- If a student wishes to study and/or work in a laboratory where no hazardous substance or procedure is involved anywhere in the laboratory, the student may do so at any hour of the day without a
partner, but the student must abide by the general safety rules outlined in the LSP/DLSP.

13.2.3 Prep Room Requirements:
- Prep rooms are working labs. Students employed to help prepare solutions and instrumentation for Chemistry courses must follow all safety procedures outlined by the LSP. The faculty member teaching the course is responsible for the supervision of this student.

13.2.4 Requirements for Personal Protective Equipment (PPE):
- All Chemistry laboratories and chemical inventory rooms require appropriate protective eye protection to be worn at all times, even when working on a computer or instrument. Three laboratories are exempt because of no working hood: Keyes 406, Keyes 303B and Keyes 111. The PI or Department Safety Coordinator supplies specific types of protective eyewear not supplied by the department. Laser protective eyewear are addressed in the Laser Safety Manual (CHO).

13.2.5 Chemistry Equipment Specific Lab Safety Requirements that require supplemental safety training from the PI:
- Laser systems (laser), side room of Keyes 205, and Keyes 403
- X-Ray Crystallography (radiation hazard) in Keyes 307
- Darkroom (radiation hazard) Keyes 406A
- Tissue Culture Hood and Workspace (biohazard), Keyes 303
- Radiation Workspaces, Keyes 303A and Keyes 309
- An industrial microwave oven (microwave), Keyes 205.
- THF/Ether distillation apparatus (flammable), Keyes 203.
- (NMR) Nuclear Magnetic Resonance (magnetism, cryogen), Keyes 208
- Hazardous Materials Hood (mutagens), Keyes 303C
- Voltametry (use of mercury), Keyes 203.
- Schlenk line in Keyes 202 and 409

13.2.6 Student Training:
- All students enrolled in chemistry laboratory classes will be safety educated by the faculty/staff laboratory instructor before any laboratory work begins. This information will be summarized in the class syllabus. At minimum, students will know where the LSP is kept, what to do in the case of an emergency and the general safety rules of that workplace. Subsequent safety issues that arise from specific laboratory procedures must be addressed at the start of the laboratory session.
- Research students and those working under limited supervision, must successfully complete the Colby College Moodle Safety Training Session and the hands on Departmental Safety Training Course. Training will be documented using the Moodle module acknowledgement of training form and a sign in sheet for hand on Departmental Safety Training. Student training sessions will be administered by the CHO and include the requirements and use of the LSP, SDS, PPE, general safety rules, the
location and use of emergency equipment including safety eye washes, showers, spill and first aid kits, chemical management, and emergency procedures for accidents and spills.

- Additional training may be required for special procedures specific to a laboratory. The PI responsible for that lab will be required to deliver, document, and enforce that training.

13.3 Geology Department

13.3.1 Geochemistry Laboratory Safety Requirements:

- Any students working unsupervised in Mudd 102B and Mudd 412 must complete Departmental safety training and utilize the buddy system (see section 13.2.2). It is the responsibility of the PI/supervisor to determine if these criteria apply to their students. Faculty and staff may require and provide additional training specific to their laboratories.

13.3.2 Geology Fieldwork Specific Safety Requirements:

- All students conducting fieldwork without direct faculty supervision must provide a faculty member with a written or electronic record of where they plan to work each time they leave for the field.

13.3.3 Requirements for Personal Protective Equipment (PPE) in select geology laboratories containing hazardous chemicals, conducting field work, and select high hazard geology equipment:

- Mudd 412 and Mudd 102B require appropriate eye protection to be worn at all times. Specific types of goggles not supplied by the department, but required for extra precautions, can be supplied by the PI or research supervisor.

- The use of lab coats is required for Mudd 412, but they are not required in other areas of the Geology Department. The use of lab coat or apron will, however, provide an additional protective layer against a spill or burn and is highly recommended when working with hazardous chemicals.

- All persons present are required to wear hearing protection and shatter-resistant eye protection while any rock saw is in use.

- Gloves must be worn while using the slab saw, trim saw, and thin-section cutoff saw that use lapidary oil.

- All persons present are required to wear hearing protection and shatter-resistant eye protection when the rock crusher is in use.

- All persons present are required to wear shatter-resistant eye protection when the rock splitter is in use.

- All persons present are required to wear hearing protection and shatter-resistant eye protection when the mechanical sieves are in use.

- All persons present are required to wear eye protection when the thin-section lapping and polishing equipment is in use.

- Thermal gloves and eye protection are required for the sample ovens.
• Closed-toed shoes and shatter-resistant eye protection are required while using hammers in the field and lab.

• Closed-toed shoes are required while using piston-coring equipment in the field.

• Close-toed shoes, hearing protection, and shatter-resistant eye protection are required while using the gasoline-powered rock drill in the field.

13.4  Department of Physics and Astronomy

The following guidelines are specific to these laboratory activities: work with chemicals in teaching and research laboratories and work with lasers. For work with radioactive sources and the use of the machine shop, consult the department chair. For use of the Collins Observatory, consult with astronomy faculty members.

13.4.1  Requirements for Working Unsupervised:

• Outside of normal work hours (Monday through Friday, 9AM – 5PM), or in the absence of other faculty, staff, or students within earshot, students are not permitted to work alone in Colby Physics and Astronomy labs while using hazardous materials or performing hazardous procedures. A partner must be within earshot, (a minimum of the same building and same floor), and must be aware of what to do in the case of an emergency.

• If a student wishes to study and/or work in a laboratory where no hazardous substances or procedure is involved anywhere in the laboratory, the student may do so at any hour of the day without a partner, but the student must abide by the general safety rules outlined in the LSP.

• Students are permitted to work alone in a laboratory with the lasers provided they have received the appropriate training, and agree to abide by the general safety rules outlined in the LSP, plus any additional requirements made by the lab PI.

13.4.2  Labs or Equipment requiring supplemental safety training by the PI or qualified laboratory instructor:

• Nuclear Physics Laboratory (radiation hazard), Mudd 306

• Vacuum systems, located in several teaching and research labs in Mudd.

• Collins Observatory

• Laser systems, located in several teaching and research labs in Mudd. See the Appendix I for basic laser safety information and the Laser Safety Manual (LSM) for guidance on safety training guidelines.

13.4.3  General Chemical Transport and Storage Requirements

• Use appropriate carts for transporting gas cylinders. The designated cart is housed in Mudd 319. Always use the chain to support the gas cylinder on the cart.

• Long-term storage of hazardous chemicals is allowed in the chemical storage cabinets in Mudd 319.

• For hazardous chemicals not stored in Mudd 319, PI's should develop a plan for long-term storage of chemicals, utilizing the Chemistry
Department’s storage facilities, if possible. Consult with the CHO and department chair for long-term chemical storage assistance.

- The Department of Physics and Astronomy discourages the use and storage of peroxide forming chemicals. These chemicals place individuals and facilities at risk, and the disposal of them, upon peroxide formation, require excessive monetary resources and risk exposure. Any instances of peroxide forming chemical use in the department will follow the guidelines for labeling, storage, and disposal outlined in the Peroxide Forming Chemicals SOP.

13.4.4 Physics and Astronomy Training:

- All laboratory personnel (including faculty, staff, research/honors students, and classroom students) who work with chemicals or lasers are required to be safely trained before starting any work in the Department of Physics and Astronomy. All personnel will review, understand, and follow all applicable safety rules and regulations outlined in the LSP and/or LSM and sign a safety agreement (LSP, appendix D) that assures they agree to follow the LSP and/or the LSM.

- It is the responsibility of the supervising faculty member to train faculty and staff employees who will work with chemicals and lasers prior to beginning work.

- For work with chemicals, the training will include: the contents of the LSP, the employee’s right to know about workplace hazards, the departmental labeling system and policies, SDS sheets, hazard determination, protective measures, location and operation of safety equipment, emergency procedures, and reporting.

- For work with lasers the training will include the contents of the LSM, hazard identification, standard safety procedures, and availability of protective equipment.

13.5 Department of Psychology

13.5.1 Requirements for Personal Protective Equipment:

- The PPE requirements are applicable to the following Psychology Department laboratories: Davis 237, Davis 300, and Davis 304. Safety glasses (ANSI z87+ approved) and lab coats are required when working with chemicals and hazardous procedures.

13.5.2. In order to work with animals in Psychology Department Laboratories, IACUC (Institutional Animal Care and Use Committee) requires completion of two online courses from the AALAS website. Both of the courses must be completed and the exams passed prior to working with the animals.

- Course #1- "Ethical Decision Making in Animal Research"
- Course #2- "8th Edition Guide to the Care and Use of Laboratory Animals"
13.5.3 Health Questionnaire:
• Laboratory Animal Occupational Health Program Health Questionnaire shall be completed and returned to the Garrison-Foster Health Center prior to beginning work with animals.

13.5.4 Lab Orientation and Safety Training:
• Faculty and staff conduct lab orientation and safety training on specific Department requirements and the Safety Training Acknowledgement form is signed and retained.

13.5.5 Lab Safety Training Moodle:
• In addition to the above training, students and researchers working under limited supervision will complete the Lab Safety Training course on Moodle, pass the quiz, and electronically sign the acknowledgement of training form.

13.5.6 IACUC Protocol Approval:
• Before beginning a research project working with animals, a written protocol explaining the proposed research plan in the IACUC protocol format must be approved by IACUC and submitted to the Department. Any volunteers or employed research assistants working on a particular study will be added to the approved protocol for that study.

14.0 ENFORCEMENT

14.1 Failure to follow the policies and procedures outlined in the LSP could result in disciplinary action up to and including expulsion from school for students and loss of employment for faculty and staff.

14.2 To ensure that the guidelines in this document are being followed, the designated Departmental Safety Coordinators or a faculty member, CHO, and the Colby EHS Director will conduct an annual compliance inspection of each Department.
15.0 ACKNOWLEDGEMENT

15.1 By signing the LSP, the following Colby Personnel are certifying that they have reviewed these procedures and safety requirements, find the contents acceptable, and agree to ensure implementation within Natural Science Departments.

________________________________________________    ______________________
Wade Behnke    Date
Environmental, Health, and Safety Director

________________________________________________    ______________________
Robert Bluhm    Date
Physics Department Chairperson

________________________________________________    ______________________
Jason Fish    Date
Academic Environmental Safety Specialist, CHO

________________________________________________    ______________________
Melissa Glenn    Date
Associate Professor of Psychology

________________________________________________    ______________________
Lynn Hannum    Date
Biology Department Chairperson

________________________________________________    ______________________
Russell Johnson    Date
Associate Provost and Dean of Faculty

________________________________________________    ______________________
Jeffrey Katz    Date
Chair, Division of Natural Science

________________________________________________    ______________________
Margaret McFadden    Date
Provost and Dean of Faculty

________________________________________________    ______________________
Philip Nyhus    Date
Environmental Studies Director

________________________________________________    ______________________
Kevin Rice    Date
Chemistry Department Chairperson

________________________________________________    ______________________
Walter Sullivan    Date
Geology Department Chairperson

________________________________________________    ______________________
Douglas Terp    Date
Vice President for Administration and Chief Financial Officer
APPENDIX A: NFPA Diamond Labeling Elements (Optional)
NFPA DIAMOND LABELING ELEMENTS

It is recommended to mark large secondary containers used for storage with the NFPA diamond to aid first responders in the event of an emergency.

The NFPA label provides basic hazard information on the flammability of the material (red square), reactivity (yellow square), health hazards (blue square) and special notice (white square).

![NFPA Diamond Diagram]

The numerals in the boxes of the diamond indicate the severity of the hazard with “0” indicating little or no hazard and “4” indicating severe hazard. For example, acetone (the major component in nail polish remover) has the ratings:

![Acetone NFPA Rating]

That is, the health rating of 1 means acetone can cause some irritation, but only minor residual injury. The fire rating of 3 means acetone is flammable (flash point < 60° C). The reactivity rating of 0 indicates that acetone is stable under a variety of conditions, including exposure to water. The MSDS/SDS is a valuable source of NFPA information.
APPENDIX B: Satellite Accumulation Area Locations
<table>
<thead>
<tr>
<th>Building</th>
<th>Room</th>
<th>Location in Room</th>
<th>Dept.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keyes Science Building</td>
<td>202</td>
<td>Fume Hood #1</td>
<td>Chem</td>
</tr>
<tr>
<td>Keyes Science Building</td>
<td>203</td>
<td>Fume Hood nearest to PQ lab &amp; ICP</td>
<td>Chem</td>
</tr>
<tr>
<td>Keyes Science Building</td>
<td>204</td>
<td>Cabinet under Hood #2 &amp; RF Machine</td>
<td>Chem</td>
</tr>
<tr>
<td>Keyes Science Building</td>
<td>205</td>
<td>Flam Cabinet under Hood #1</td>
<td>Chem</td>
</tr>
<tr>
<td>Keyes Science Building</td>
<td>210</td>
<td>Cabinet under Hood #2</td>
<td>Chem</td>
</tr>
<tr>
<td>Keyes Science Building</td>
<td>211</td>
<td>Fume Hood</td>
<td>Chem</td>
</tr>
<tr>
<td>Keyes Science Building</td>
<td>303</td>
<td>Fume Hood #2</td>
<td>Chem</td>
</tr>
<tr>
<td>Keyes Science Building</td>
<td>305</td>
<td>Fume Hood next to fire exit door on left</td>
<td>Chem</td>
</tr>
<tr>
<td>Keyes Science Building</td>
<td>309</td>
<td>Fume Hood on outside wall</td>
<td>Chem</td>
</tr>
<tr>
<td>Keyes Science Building</td>
<td>403</td>
<td>Fume Hood</td>
<td>Chem</td>
</tr>
<tr>
<td>Keyes Science Building</td>
<td>406A</td>
<td>Dark Room</td>
<td>Chem</td>
</tr>
<tr>
<td>Keyes Science Building</td>
<td>408</td>
<td>Flam Cabinet Under Hood #3 on Left</td>
<td>Chem</td>
</tr>
<tr>
<td>Olin Science Building</td>
<td>221</td>
<td>Fume Hood</td>
<td>ES</td>
</tr>
<tr>
<td>Olin Science Building</td>
<td>227</td>
<td>Lachat Machine</td>
<td>ES</td>
</tr>
<tr>
<td>Olin Science Building</td>
<td>228</td>
<td>Fume Hood</td>
<td>ES</td>
</tr>
<tr>
<td>Olin Science Building</td>
<td>229</td>
<td>Fume Hood</td>
<td>ES</td>
</tr>
<tr>
<td>Olin Science Building</td>
<td>323</td>
<td>Counter</td>
<td>Bio</td>
</tr>
<tr>
<td>Arey Science Building</td>
<td>009</td>
<td>Cabinet</td>
<td>Bio</td>
</tr>
<tr>
<td>Arey Science Building</td>
<td>301</td>
<td>Cabinet</td>
<td>Bio</td>
</tr>
<tr>
<td>Davis Science Building</td>
<td>237</td>
<td>Under Fume Hood</td>
<td>Psych</td>
</tr>
<tr>
<td>Davis Science Building</td>
<td>300</td>
<td>Under Fume Hood</td>
<td>Psych</td>
</tr>
<tr>
<td>Mudd Science Building</td>
<td>412</td>
<td>Under Fume Hood</td>
<td>Geo</td>
</tr>
<tr>
<td>Mudd Science Building</td>
<td>308</td>
<td>Fume Hood</td>
<td>Physics</td>
</tr>
</tbody>
</table>
APPENDIX C: GHS Pictograms
GHS Pictograms

Outside of each laboratory door there is a list of the contact person(s) for that room and symbols showing the hazards located in that room. Please be familiar with the hazards and PPE symbols listed for your lab.

The following pictograms are used to indicate physical hazards related to each chemical:

![Physical Hazards Pictograms](image)

Explosives  Flammable Liquids  Oxidizing Liquids  Compressed Gases  Corrosive to Metals

The following pictograms are used to indicate health hazards related to each chemical:

![Health Hazards Pictograms](image)

Acute Toxicity  Skin Corrosion  Skin Irritant  CMR®, STOT®, Aspiration Hazard

In addition to the GHS pictograms, each lab will have symbols indicating the required PPE. Also for select labs, there may be signage indicating the presence of lasers, biohazards or other hazardous materials or processes.
APPENDIX D: Laboratory Safety Training Acknowledgment
LABORATORY SAFETY TRAINING ACKNOWLEDGEMENT

By signing this Safety Training Acknowledgement, I,_____________________________(Printed Name) confirm that:

- I have reviewed and understand the Department’s Laboratory Safety Plan (DLSP) and Colby College Laboratory Safety Plan (LSP).
- I will follow all safety rules found in the applicable Plans, including, but not limited to, proper protective equipment, chemical handling, emergency response, proper attire, hazardous waste handling, and no food or drink in labs.
- I will report any safety hazard to my instructor, CHO, or EHS Director.
- I will report any chemical spills to my instructor immediately.
- I understand that failure to follow the practices contained in the plans could result in a downward grade adjustment and/or disciplinary action up to and including dismissal from Colby.
- I understand that failure to follow the practices contained in the LSP and DLSP could result in serious injury, or even death to a classmate or myself.

Signature:_____________________________   Date:___________________________
APPENDIX E: Spill Reporting Form
# HAZARDOUS MATERIALS INCIDENT

<table>
<thead>
<tr>
<th>INITIAL NOTIFICATION</th>
<th>Date of Incident:</th>
<th>Time of Incident: AM PM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Building and lab Number</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contact Information: Spiller/Responsible Party: Call back Person/Number:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Type of Incident:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Material Released and Quantity (if known):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is the Release on going: Yes No</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Released to: Soil Water Ocean Air Well Sewer Containment Other:</td>
<td></td>
</tr>
</tbody>
</table>

Submit to the CHO within 24 hours of the spill Notification: Date: Time:
APPENDIX F: Student Accident Report Form
## Personnel Involved

<table>
<thead>
<tr>
<th>Name of Student:</th>
<th>Student Signature (if possible):</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI Completing Form</td>
<td>PI Signature:</td>
</tr>
</tbody>
</table>

## Accident Information

<table>
<thead>
<tr>
<th>Location of Accident (Bldg/Room):</th>
<th>Date and Time of Accident:</th>
</tr>
</thead>
</table>

### Type of Injury and Body Part Affected

### Description of Accident (include any chemicals, equipment or PPE involved):

### Describe medical care required and provider:

## Witness Information

<table>
<thead>
<tr>
<th>Witness Name:</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Witness Name:</td>
<td>Comments:</td>
</tr>
<tr>
<td>Witness Name:</td>
<td>Comments:</td>
</tr>
</tbody>
</table>

## Accident Investigation/Follow Up

<table>
<thead>
<tr>
<th>Cause of Accident:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Corrective Action Taken to Prevent Recurrence:</th>
</tr>
</thead>
</table>
APPENDIX G: Emergency Eyewash and Shower Locations
<table>
<thead>
<tr>
<th>Keyes Building 1300</th>
<th>Eye washes</th>
<th>Shower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement Hallway (004)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 105A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 107</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>keys 202</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 203</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Keyes 205</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 207</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Keyes 209</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 2nd Floor Hallway</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 210</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 214</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 303</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 305</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 309</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 4th floor Hallway</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 405</td>
<td>X (x4)</td>
<td>X</td>
</tr>
<tr>
<td>Keyes 408</td>
<td>X (x4)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arey Building 3800</th>
<th>Eye washes</th>
<th>Shower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement Hallway</td>
<td>X (x2)</td>
<td>X</td>
</tr>
<tr>
<td>Arey 102</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arey 109</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arey 111</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arey 1st Floor Hallway</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Arey 201A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arey 201</td>
<td>X (x4)</td>
<td></td>
</tr>
<tr>
<td>Arey 202A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arey 202</td>
<td>X (x4)</td>
<td></td>
</tr>
<tr>
<td>Arey 204</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arey 205</td>
<td>X (x3)</td>
<td></td>
</tr>
<tr>
<td>Arey 206</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arey 207</td>
<td>X (x4)</td>
<td></td>
</tr>
<tr>
<td>Arey 2nd Floor Hallway</td>
<td>X (x2)</td>
<td>X (x2)</td>
</tr>
<tr>
<td>Arey 301</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arey 302</td>
<td>X (x4)</td>
<td></td>
</tr>
<tr>
<td>Arey 303</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arey 305</td>
<td>X (x3)</td>
<td></td>
</tr>
<tr>
<td>Arey 307</td>
<td>X (x3)</td>
<td></td>
</tr>
<tr>
<td>Arey 3rd Floor Hallway</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Olin Building 3566</th>
<th>Eye washes</th>
<th>Shower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olin 214</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Olin 221</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Olin 222</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Olin 223</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Olin 227</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Olin 228</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Olin 319</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Olin 320</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Olin 323</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Olin 3rd Floor Hallway</td>
<td>X (x2)</td>
<td>X (x2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Plant Department Bldg.</th>
<th>Eye washes</th>
<th>Shower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wash bay</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mechanic bay</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Alford Athletic Center Ice Rink</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zamboni Room</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Chiller Room</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pipe Shop/Pool Chem Area</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bixler Building</th>
<th>Eye washes</th>
<th>Shower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sculpture Studio 117 1934</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Photo Studio 278 2011 Sink</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Painting Studio 250 1946</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mudd Building 2900</th>
<th>Eye washes</th>
<th>Shower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mudd 102</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mudd 109</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mudd 214</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mudd 319</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
APPENDIX H: Peroxide Forming Chemicals SOP
Standard Operating Procedure: Peroxide Forming Chemicals

Purpose:
This document will outline the procedures Colby College Laboratories will use to minimize the risks associated with utilizing peroxide forming chemicals. Peroxide forming chemicals undergo auto oxidation reactions upon exposure to atmospheric oxygen to form organic peroxides. Under normal storage conditions, the unstable peroxides can accumulate in the container and may explode when subjected to heat, light, friction, or mechanical shock.

Peroxide Forming Chemicals:
Most peroxide forming chemicals are carbon-based chemicals capable of forming potentially explosive peroxide “O-O” bonds. Depending upon the danger of peroxide accumulation, peroxide-forming chemicals can be divided into three categories (Class A, B, and C) listed below. The lists are not comprehensive and faculty and staff must check Safety Data Sheets and other sources of information to determine a new chemical’s peroxide forming potential.

List A: Examples of chemicals that spontaneously form peroxides on exposure to air (typically when opened) without further concentration or evaporation.

<table>
<thead>
<tr>
<th>Isopropyl ether</th>
<th>Sodium amide</th>
<th>Potassium metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vinylidene chloride</td>
<td>Potassium amide</td>
<td>Divinyl ether</td>
</tr>
</tbody>
</table>

List B: Examples of chemicals that form peroxides on concentration through distillation, evaporation, or exposure to air after opening.

<table>
<thead>
<tr>
<th>Diethyl ether</th>
<th>Vinyl ether</th>
<th>Dicyclohexane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dioxanes</td>
<td>Tetrahyrdofuran</td>
<td>Furan</td>
</tr>
<tr>
<td>Ethylene glycol</td>
<td>2-methoxyethyl ether</td>
<td>Nitromethane</td>
</tr>
<tr>
<td>dimethyl ether</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List C: Examples of chemicals, which could auto polymerize as the result of peroxide formation.

<table>
<thead>
<tr>
<th>Styrene</th>
<th>Butadiene</th>
<th>Acrylonitrile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl methacrylate</td>
<td>Vinyl pyridine</td>
<td>Chlorobutadiene</td>
</tr>
</tbody>
</table>

Storage and Labeling:

General Precautions:
• Minimize the quantity of peroxide forming chemicals in the lab and always utilize the oldest materials first.
• Store peroxide forming chemicals in sealed, air tight containers away from sources of heat and light.
• Label each container with the date received, first opened, and of the most recent test for peroxides in accordance with the details provided in the section entitled “Peroxide Test Method”.
• Never open or disturb containers of unknown age or history. Notify the Academic Environmental Safety Specialist (AESS)/CHO or the EH&S Director to arrange for removal and disposal.

Labeling and Inventory Procedures

1. Newly ordered peroxide forming chemicals will have the safety datasheet added to the eBinder and also to the peroxide forming chemical group.

2. The container will be added to the electronic inventory and a QR coded label will be created to track the bottle.

3. A green circular peroxide former hazard label will be attached to the bottle. If a known peroxide former does not have a peroxide former label, please contact the AESS/CHO to provide one. (The AESS/CHO or the Chemistry Department Administrative Assistant will perform Steps 1 through 3.)

4. The user will later update the circular peroxide former label with the date upon opening.

5. Annually, the AESS/CHO will create a list of peroxide forming chemicals from each lab and request the responsible PI check each opened container for peroxides using the method described below. An orange circular peroxide former hazard label will be provided by the AESS/CHO with the test date on it. If the bottle is small and no location can be found on the bottle without covering the manufacturer’s labeling, the test date peroxide former hazard label may be placed over the date-opened peroxide former hazard label. It is important not to cover the original hazard communication labeling provided by the manufacturer.

Peroxide Testing Method:

Visual Inspection:

Visually inspect all peroxide forming chemicals before opening. Never try to force open a rusted or stuck cap. A container that exhibits any unusual characteristics, such as those listed below, should
be assumed to have high levels of peroxides and should not be used. Notify AESS/CHO or EH&S Director to arrange for removal and disposal.

For liquids: Look for crystallization, near the cap or in the liquid, visual discoloration, or stratification. Diethyl ether is often sold in cans, which prevent visual inspection. Containers of diethyl ether, in cans prohibiting visual inspection, of unknown age should be handled as containing peroxides and should not be disturbed.

For solids: (potassium metal, sodium amide) look for discoloration and/or the formation of surface crust. Evaluations of alkali metals and their amides are conducted using visual observations only.

**Testing for Peroxide Concentration:**

After the visual inspection, test for peroxide concentrations in liquids using Quantofix Peroxide 25 or Quantofix Peroxide 100 test strips. A concentration of 100PPM peroxide is the most broadly accepted control point. Request test strips from the AESS/CHO as needed.

For volatile organic chemicals, immerse the test strip in the chemical for 1 second remove and allow it to dry. Place a drop of water onto the test strip, wait 15 seconds, and then compare with the color scale.

**Peroxide Concentration Action Levels**

- If peroxides are not detected, place a new peroxide former hazard label with the test date on the container and continue to use.
- If the peroxide concentration is greater than 25 ppm, but less than 100 ppm, the chemical may still be used, but do not distill or concentrate. Label the container in the same manner as above.
- If the peroxide concentration is greater than or equal to 100 ppm, it should be disposed of as a hazardous waste. Contact the AESS/CHO or EH&S Director to arrange for removal and disposal.

**Storage Limits for Peroxide Forming Chemicals:**

- **Unopened chemicals from the manufacturer:** Test for peroxides or dispose after 18 months.
- **List A Chemicals:** Test for peroxides or dispose after 6 months of opening.
- **List B Chemicals:** Test for peroxides or dispose after 12 months of opening.
- **List C Chemicals:** Test for peroxides or dispose after 12 months of opening.
- **Pyrophoric Chemicals in Peroxide Forming Solvents (THF, ether, ect.):** No peroxide concentration testing with peroxide test strips, dispose of according to the timeframes above for the peroxide forming chemical.
APPENDIX I: Laboratory Safety Training Summary

LABORATORY SAFETY TRAINING SUMMARY
Colby College Department of Biology
(v2 F18)

PURPOSE

This document summarizes critical information regarding general laboratory safety in Colby College Biology Department teaching laboratories. It is not intended to replace more comprehensive information available in Colby’s Laboratory Safety Plan (LSP). Participation in certain teaching and research laboratories may require additional safety training and certification.

ACKNOWLEDGEMENT

You may be required to sign and submit the attached form acknowledging that you understand these safety guidelines and the consequences for not following them.

GENERAL INFORMATION

Emergency contact and chemical hazard information are posted outside the door of all biology laboratories. General safety regulations are posted in a prominent place inside the laboratories. Familiarize yourself with the location and content of such signage in every lab in which you work.

Your instructor will alert you to the hazards and safety requirements specific to your laboratory or activity. In general, please observe these safety guidelines when working in any biology laboratory:

• No food, gum or drink in lab at any time.
• Wear shoes (no sandals, open toed shoes or bare feet).
• Wear eye protection and other protective clothing (e.g., gloves, lab coats, aprons) and equipment (e.g., fume hoods) when working with any hazardous chemicals or procedures.
• Do not wear headphones in the lab.
• Know the locations of the nearest eyewash, shower, fire blanket and extinguisher, first aid kit, spill kit and gas shutoffs.
• Keep work areas neat. Store chemicals in their proper place. Use equipment properly and heed any relevant safety warnings.
• Understand the hazards specific to your laboratory or activity. Ask questions if in doubt.

CHEMICAL HAZARDS
Labeling and Storage

All chemical containers, whether original or secondary, MUST be labeled as to their contents. NEVER leave a chemical container unlabeled, even if you are using it for only a short period of time!

Chemical hazards vary in both type and intensity. Major classes of chemical hazards include flammability, health, and reactivity (i.e., instability). Many chemical bottles will feature a diamond-shaped NFPA label detailing the degree of each of these hazards. Note the appearance of the NFPA label in the example below; the four colored quadrants represent these specific hazards, with the number (0-4) representing the degree of that hazard. A fourth quadrant is included to indicate any special hazards specific to that chemical.

![NFPA label example](image)

Chemicals posing significant hazards in one or more of these areas are typically stored in a separate location designed to minimize risk. For examples, flammable chemicals and strong acids are kept in special cabinets clearly labeled for those purposes. Know the locations of such cabinets in your laboratory.

Disposal

Once used, hazardous chemicals are considered hazardous waste. They must be clearly labeled as such, and placed in an approved Satellite Accumulation Area (SAA) pending proper disposal. Your instructor will direct you to the nearest SAA when necessary.

Notify your instructor in the event of a chemical spill (hazardous or not). Teaching laboratories are equipped with basic chemical spill kits to facilitate proper clean-up and disposal of chemical spills.

More Information

LSP, Colby College
5500 Mayflower Hill, Waterville ME 04901
Comprehensive information about any chemical can be found in that chemical’s Material Safety Data Sheet (MSDS/SDS). In an emergency, an online search may be the quickest way to locate an MSDS. Colby also maintains an MSDS database at:

www.colby.edu/humanresources/academic-safety-programs/

OTHER HAZARDS

**Sharps and Glassware**

Biology laboratories often use sharps such as razor blades, scalpels, or needles. Glassware (including slides and coverslips) is used extensively, and is subject to breakage. These items must be stored and disposed of properly, typically in special bin or box designed for the purpose.

NEVER DISPOSE OF SHARPS OR GLASS (BROKEN OR NOT) IN THE TRASH!

**Equipment**

Laboratory equipment may require you to observe certain precautions, both for your own safety, and for that of the equipment. Read all warnings and operating instructions carefully, and consult your instructor if something is not clear.

Use care when moving heavy or bulky equipment. Use both hands and, if necessary, a suitably sturdy cart.

**Open Flames**

Exercise particular caution around open flames (such as Bunson burners). Maintain a wide area around the flame that is clear of chemical, lab equipment, papers, books, and body parts (including long hair).

NEVER LEAVE A FLAME UNATTENDED, EVEN FOR A MOMENT!

**Biohazards**

Use protective clothing (such as gloves) when handling potentially pathogenic organisms or biohazardous substances. Wash your hands thoroughly when you are finished working.

Dispose of such materials (including gloves and other potentially contaminated items) in receptacles designed for the purpose. These are typically special bags in which substances can be sterilized prior to disposal.

**EMERGENCY RESPONSE**
**Chemical Contact**

Contact with a hazardous chemical requires the following immediate actions:

- If splashed: use the nearest eyewash (keep eye open) or shower (remove clothing) for at least 15 minutes. *Eyewash stations are found in every laboratory, usually near a sink. Eyewash stations and emergency showers are located near laboratories in the Arey and Olin hallways.*
- If inhaled: immediately remove the victim to fresh air using appropriate precautions.
- If burned: soak in an ice water bath for at least 15 minutes.

ALWAYS alert your instructor of any injuries, accidents, or near accidents (even the minor ones). Serious cases may require intervention by emergency personnel.

**Fire**

ONLY TRAINED FIREFIGHTERS ARE EXPECTED TO FIGHT FIRES! Do not attempt to extinguish any fire. Exit the building as quickly as possible, pulling the fire alarm as you leave.

In the event of a fire alarm, immediately stabilize any ongoing chemical reaction and exit the building as quickly as possible. Congregate with other building occupants at a safe distance from the building. Do not leave the area.

**Getting Help**

Dial 5911 from any campus phone to report an emergency directly to campus security (who will quickly summon the appropriate authorities). *Campus phones are located near laboratories in the Arey and Olin hallways.*

In the event of a fire, pull the fire alarm to immediately dispatch the local fire department.

**Campus-Wide or Civil Emergencies**

If you hear the alarm siren atop the Mudd building sound, listen for and follow any verbal instructions given at the end of the tone. If you cannot clearly understand the instructions, go to the Colby College homepage ([www.colby.edu](http://www.colby.edu)) and follow the instructions given there.

---

**COLBY COLLEGE**

**BIOLOGY SAFETY TRAINING ACKNOWLEDGEMENT**
By signing this Safety Training Acknowledgement, I, __________________________ (Print Name), confirm that:

• I have read and understand the Biology Department’s Laboratory Safety Summary.

• I will follow all safety rules found in the Biology Department’s Laboratory Safety Summary, including, but not limited to, proper protective equipment, chemical handling, emergency response, proper attire, hazardous waste handling, and no food or drink in labs. I understand that I am also obligated to follow any additional specific safety instructions provided by my instructor.

• I will report any safety hazard to my instructor immediately.

• I will report any chemical spill to my instructor immediately.

• I understand that failure to follow the practices contained in the Biology Department’s Laboratory Safety Summary could result in a downward grade adjustment and/or disciplinary action up to and including dismissal from Colby.

• I understand that failure to follow the practices contained in the Biology Department’s Laboratory Safety Summary could result in serious injury, or even death to a classmate or myself.

Signature: ____________________________

Date: ____________________________
APPENDIX J: LSP Revision History

This written program and attached procedures will be reviewed annually by the EHS Director. The Plan requirements are amended as necessary to address changes which affect laboratory safety, new equipment or new chemicals. The Plan will also be amended if deficiencies are revealed during safety incidents or near misses.

<table>
<thead>
<tr>
<th>REVISION</th>
<th>DESCRIPTION OF CHANGE</th>
<th>REVISION EFFECTIVE DATE</th>
<th>REVISION COMPLETED BY: NAME / COMPANY</th>
<th>MANAGER APPROVAL / DATE</th>
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<tbody>
<tr>
<td>A</td>
<td>• Original Program</td>
<td>2009</td>
<td>Bruce McDougal, Colby College</td>
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<tr>
<td>B</td>
<td>• Revised format</td>
<td>May, 2014</td>
<td>Wade Behnke, Colby College</td>
<td>Mark Crosby</td>
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<td></td>
<td>• Changed hazard symbols to GHS symbols</td>
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<td>• Removed Department specific information</td>
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<td></td>
<td>• Revised Accident Form and Spill Reporting Form</td>
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<td>• Removed references to art studios</td>
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<td>C</td>
<td>• Added Definitions: First aid, independent work, HWSA, secondary container</td>
<td>April, 2016</td>
<td>Wade Behnke Colby College</td>
<td>Mark Crosby</td>
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<td></td>
<td>• Revised responsibility’s and added AESS Position</td>
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<td>• Revised Section 6.1.6 on minors in the labs</td>
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<td>• Revised Section 6.2.4 to require lab coats in select circumstances</td>
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<td>• Revised Section 7.1.4 to cover labeling of samples and small containers</td>
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<td>• Revised Section 9.2 to cover the addition of MSDSonline</td>
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<td>• Revised Section 12 to reflect current practices</td>
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<td></td>
<td>• Minor edits and updates throughout</td>
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<td></td>
<td>• Updated appendices as needed</td>
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| D        | • Removed requirement to mark all secondary containers with a NFPA diamond  
          • Added the Peroxide Formers SOP as Appendix H  
          • Added requirement for chairs to notify CHO 6 months prior to a faculty member leaving the College to inventory their lab space  
          • Modified training requirements (Section 12) to include new faculty and professional visitors  
          • Added Section 6.6 Chemical Specific Safety Requirements to cover HF and Peroxide formers  
          • Added Section 7.3 Chemical Inventory Process | July, 2017 | Jason Fish/Wade Behnke-Colby College | Mark Crosby |
| E        | • Add Section 13.0 Departmental Specific Requirements | August, 2018 | Jason Fish/Wade Behnke Colby College |