Palo Alto College

Chemical Hygiene Plan

August 27, 2020

Emergency and non-Emergency Contact Numbers

Alamo Colleges Police Department (Emergency)	210-485-0911
Alamo Colleges District - Enterprise Risk Management	210-485-0768 or 0206
South Texas Poison Center	1-800-222-1222
Facilities	210-485-0702

When making an emergency call:

- Give your name, location and phone number
- Describe what happened
- Do not hang up until the dispatcher has completed all of their questions

Contents

I. ADMINISTRATIVE

A. Purpose

The purpose of the Chemical Hygiene Plan (CHP) is to reduce the health risks placed on laboratory employees, faculty, staff, students and other related users using potentially hazardous chemicals. The CHP is written for Palo Alto College (PAC) to comply with the guidelines established by the Texas Health and Safety Code 502, 29 CFR 1910.1200, Hazard Communication; 29 CFR 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories; and 40 CFR (EPA) Part 261-266 Identification and Listing of Hazardous Waste.

B. Scope

This CHP is applicable to all operational elements of PAC Laboratories as defined by OSHA 1910.1450. The procedures and policies set forth in this CHP are mandatory. This plan requires that personnel using potentially hazardous chemicals in laboratories be trained in safe work practices, and be informed of the risks associated with the use of hazardous chemicals.

C. Plan Development and Maintenance

The Plan was developed by a collaborative effort between the Alamo Colleges District Enterprise Risk Management Department and the Coordinator of College Risk Management and in cooperation with the Vice President of Academic Success, Chairperson of the Sciences and Kinesiology Department, and the Academic Laboratory Technicians. The plan will be reviewed and revised yearly by the Chemical Hygiene Committee. The committee is chaired by the Coordinator of College Risk Management and will have at least one member from the Sciences and Kinesiology Department and one member from Veterinary Technology.

D. Responsibilities

Responsibility for the Chemical Hygiene Program (CHP), includes:

1. Enterprise Risk Management - The District Environmental Health and Safety Coordinator is responsible for:

    a. Providing and/or assisting the Department Chair and Chemical Hygiene Officer in investigating reported incidents that resulted in, or could have resulted in, potential exposure to hazardous chemicals, chemical spills etc. Any incident or accident must be reported to Risk Management.

    b. Responding to all major and/or minor spills as needed.

    c. Making arrangements with approved environmental health vendor to properly contain and remove all major chemical spills.

d. Conducting periodic auditing/inspection of the labs.

e. Upon request, conducting IAQ surveys in labs as needed.

f. Writing formal report of findings and recommendations an accident report form is available.

g. Providing guidance on hazardous waste handling, storage and disposal.

h. Providing oversight on the online SDS program (MSDSOnline.com).

i. Upon request, providing and/or arranging for HAZCOM training.

j. Reviewing plans for new labs or renovations of old labs for environmental health compliance.

2. Department Chairperson - The Chairperson, with the support of the Academic Lab Techs, have the ultimate responsibility for managing and implementing the CHP and must:

a. Ensure compliance with all applicable HAZCOM, Chemical Hygiene and Laboratory regulatory requirements.

b. Provide continued support and resources to ensure the program is operating effectively, efficiently and safely in accordance with all regulatory requirements.

c. Approve all proposed changes in laboratory procedures or alterations of engineering controls prior to implementation.

d. Oversee and implement the development of procedures for processes that involve chemical manipulation, including laboratory technician procedures and student lab experiments and procedures.

e. Approve all new and/or renovations in laboratories prior to implementation.

f. Provide a list of all employees working with hazardous chemicals to the Chemical Hygiene Officers.

g. Notify the Chemical Hygiene Officers of newly hired employees that will be working with hazardous chemicals.

h. Provide training for all laboratory technicians in accordance with the Chemical Hygiene Standard (29CFR.1910.1450).

i. Provide employee notification at his/her initial assignment that hazardous materials are present and when new hazards are will be present.

j. Fund annual fume hood recertification.

3. Chemical Hygiene Officer - Two Chemical Hygiene Officers will be represented by Veterinary Technology(1) and the Sciences and Kinesiology(1) and shall:

a. Develop appropriate chemical hygiene policies including chemical storage, waste and disposal procedures.

b. Monitor procurement, use, and disposal of chemicals used in the laboratory and ensure that appropriate audits are conducted and documented.

c. Review the CHP in collaboration with the Chemical Hygiene Committee, at least annually, and revise the document as necessary to reflect current regulatory practice and college changes.

d. Collaborate with the CCRM and Lab Techs on revisions of the Chemical Hygiene Plan, chemical safety procedures, and chemical waste and disposal procedures.

e. Ensure HAZCOM training is provided to all employees on the hazards associated with laboratory operations and maintain records of this training

f. Provide training to the Laboratory Technicians on the Online system (MSDSonline) and periodically audit the laboratory storage for compliance.

g. Ensure injured employees receive job-related medical assistance as needed under the Workers Comp Program as directed by Enterprise Risk Management.

h. Review plans and specifications for all laboratory construction and/or renovation with Facilities, Administration, Vendor and/or Enterprise Risk Management to ensure appropriate design criteria are incorporated.

i. Inform new laboratory employees of workplace hazards and requirements of the CHP.

j. Ensure employee(s) receive the appropriate training on work practices and the use of PPE.

k. Conduct routine inspections of laboratory areas to monitor compliance with the CHP and all regulatory requirements.

l. Provide guidance to the Department Chair and Laboratory Technicians to ensure chemicals and waste are handled in accordance with all HAZCOM, TCEQ and EPA regulatory requirements.

4. Faculty

a. Ensure students participating in lab sessions are aware of the hazards associated with chemicals and experiments/procedures.

b. Ensure students have the appropriate PPE and are wearing it at all times while handling chemicals and/or performing experiments/procedures.

c. Ensure students are provided the proper guidance in performing lab procedures safely.

d. Provide guidance to Laboratory Technicians on which chemicals are necessary to keep in inventory based on current course offerings and curriculum.

5. Laboratory Technicians

a. Ensure the health and safety of employees and students within the laboratories.

b. Maintain a complete and accurate chemical inventory that must be updated as new chemicals are procured. Inventory must be reviewed on periodic basis through the year for completeness.

c. Ensure Safety Data Sheets are up to date in MSDSonline System for all chemicals present in the laboratory. Keep hard copies available for access.

d. Ensure all primary and secondary chemical containers are labeled properly, in accordance with the Global Harmonized System.

e. Alert the Chemical Hygiene Officer and their Supervisor of any spills and/or exposure to chemicals.

f. Be available to attend training provided by Alamo Colleges District and Palo Alto College related to their roles and responsibilities.

g. Ensure all eyewash stations and emergency showers are functioning on a weekly basis.

h. Ensure fume hoods are operating adequately prior to use.

i. Ensure the proper engineering controls and personal protective equipment (PPE) are obtained and used.

6. Chemical Hygiene Committee

a. Coordinate scheduling of annual fume hood recertification with Chemical Hygiene Officer.

b. Review chemical hygiene plan on an annual basis and recommend changes to the Chemical Hygiene Officers and Department Chair.

c. Review and revise Standard Operating Procedures for chemical storage, waste and disposal.

d. Review and revise Standard Operating Procedures for Personal Protective Equipment (PPE).

e. Review and revise training programs related to HAZCOM and the Chemical Hygiene Plan.

E. Training Programs

1. The Department Chair and the Chemical Hygiene Officers must provide information and training to employees and/or students to ensure they are apprised of chemical hazards in the laboratory.

2. Training shall occur annually or when new hazards become present in the laboratories not addressed by previous training.

3. Employees shall be informed of:

   a. The contents of Health and Safety Code 502; 29 CFR 1910.1200, Hazard Communication; 29 CFR 1910.1450 Laboratory Standard; and 40 CFR Part 261-266 and its appendices, Hazardous Waste.

   b. Location and availability of the Chemical Hygiene Plan, Chemical Inventory List, SDS (Right-To-Know) binder and/or online SDS program (MSDSonline).

   c. PELs for OSHA regulated substance or recommended exposure limits for other extreme hazardous and hazardous chemicals.

   d. Signs and symptoms associated with possible exposure to hazardous chemicals.

   e. How to interpret the reference material, including SDS Sheets.

   f. How to properly handle minor and major chemical spills, to include notification procedures.

   g. Proper chemical storage, handling and disposal.

   h. Appropriate PPE, storage, use and maintenance.

   i. How to properly dispose of hazardous chemicals.

4. Employees handling hazardous chemicals must be trained. Training will include the following (29 CFR 1910.1450):

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

    b. Physical and health hazards of chemicals in the work area.

    c. Employees should be trained in the details of the CHP, which include:

        (1) Standard Operating Procedures for handling selected carcinogens, reproductive and acute toxins, compressed gasses, combustibles, flammables, oxidants, and hazardous wastes.

        (2) Use of Chemical Inventory List, Safety Data Sheets (SDS), Online SDS Program and other hazardous chemical hazardous communications procedures.

        (3) General Emergency Procedures.

        (4) Use of common Personal Protective Equipment (PPE), engineering controls and work practices.

F. Laboratory SOPs

All Standard Operating Procedures for non-administrative functions must contain specific instructions on the safety precautions, safe handling procedures, and disposal procedures for all hazardous chemicals used or created in the procedure.

G. Signs and Labels

29 CFR 1910, Subpart Z, requires employers to identify all devices, structures, and areas where hazardous materials are used or where possible hazardous situations exist.

1. Post prominent signs and labels identifying the following:

    a. All hazardous chemical containers in the laboratory must have the original manufacturer's label showing the identity of the hazardous chemical(s) contained therein and appropriate hazard warning. Any hazardous chemical that is transferred to an additional container (e.g., stock solutions, buffers, etc.) must be labeled with the contents and any hazard warnings in accordance with the Global Harmonized System (GHS).

    b. Prominently label all safety showers, eyewash stations, other safety and first aid equipment, and exits.

    c. Eating, drinking, chewing gum, horseplay, and application of cosmetics or topical medications is prohibited in all laboratory areas.

    d. Prominently label all refrigerators. Laboratory containers/reagent containers will not be used to contain food for human consumption; likewise, food containers will not be used to contain chemical materials.

2. Guidelines for safety colors and specifications for accident prevention signs and tags are contained in Texas Health and Safety Code 502, 29 CFR 1910.1200, Hazard Communication and 29 CFR 1910.1450

II. PERSONAL PROTECTIVE EQUIPMENT

A. General

PPE and clothing provide protection for employees and/or students from possible exposure to potentially hazardous chemicals, materials, or working conditions.

1. The Department Chair must provide comprehensive training to employees and/or students on the proper use, application, maintenance, and storage of PPE. The Chemical Hygiene Officer will assist in determining appropriate training. Employees shall inspect the PPE regularly for signs of defects. Do not use PPE if it is old and defected. Mark such items as unusable and repair or destroy.

2. Protective apparel and equipment for each laboratory shall be compatible with the required degree of protection for the material or chemical being handled.

B. Eye and Face Protection

The eye protection shall meet the requirements of ANSI Standard Z87.1.

1. The Science Department shall ensure all employees and students are provided with and using the appropriate (approved lab goggles) eye and face protections when there is a potential for chemical exposure such as a liquid splash.

2. Safety glasses will be considered the minimum eye protection to be used in the laboratory.

3. Full face protection must be worn during operations where a significant splash hazard exists or where corrosives are used. Face shields should be worn when additional eye/face protection is necessary against splash or projectiles. Face shields will be used in combination with approved eye protection.

4. Employees and students who wear prescription lenses must wear the proper lab eye protection that incorporates the prescription in its design or proper lab (goggles) eye protection that can be worn over prescription lenses without interference to vision.

5. Contact lenses are not authorized in the laboratory because hazardous gases and vapors may get trapped under contact lenses, and prolonged exposure to those gases and vapors may create the potential for increased eye damage.

6. Non-prescription safety goggles must be available to all laboratory employees and students.

C. Hand and Foot Protection

1. Open-toe sandals are prohibited in all laboratories. Sturdy shoes with rubber (non-conducting) soles are recommended.

2. Employees and students shall wear the appropriate safety gloves whenever their hands are exposed to potential chemical, thermal or biological hazards. There is not one type of glove that offers the best protection against all chemicals. Gloves must be evaluated for their ability to protect against degradation, permeation, as well as their dexterity, resistance to cuts and abrasions, the chemical being handled and the procedure being performed. Appendix G: Glove Chart provides guidance for the most commonly used types of gloves. The chart is meant only as a guide. More detailed information on glove choices can be found on the specific chemicals safety data sheets or by accessing the glove manufacturer's website.

3. The Science Department shall determine which gloves are appropriate for which procedures based on glove manufacturer information and the type of chemical.

4. See Appendix G: Glove Chart for reference.

D. Protective Clothing

1. All employees and students are required to wear appropriate protective clothing when working in the laboratory. The degree of protective clothing needed is dictated by the potential health hazards associated with the type of chemicals required for a specific procedure.

2. Pants must be worn for all lab sessions. No Shorts are allowed.

3. The laboratory coats are disposable. The laboratory coat should be disposed of when it appears dirty and/or contaminated or at the discretion of the Laboratory Technician and/or supervisor.

4. Rubber or plastic aprons must be worn for protection against corrosive or irritating chemicals. A laboratory coat and apron must be worn when there is the possibility of Corrosive, Caustic, or Oxidizer spills, splashes, or drips. Plastic aprons can accumulate static electricity and must be avoided in areas where flammable solvents are in use.

5. A laboratory coat should be worn while conducting lab activities when contamination is possible in order to reduce the potential for chemical contact. When significant potential for liquid contact exists, the use of safety goggles, impervious gloves and an impervious apron over the lab coat should be considered. A fire resistant lab coat should be worn in situations where a violent chemical reaction/heat is possible.

III. EMERGENCY PROCEDURES

A. General

In cases of an emergency, *remain calm*, immediately notify your supervisor, the administration, ACPD, ERM and/or appropriate emergency agency. Call the emergency contact number for Alamo Colleges Police Department under any circumstances that require emergency response.

B. Chemical Spills

Chemical spills are classified as either minor (under 1-gallon liquid or 1 kg solid material) or major (greater than 1-gallon liquid or 1 kg solid material*).* All accidents or near accidents shall be documented and carefully analyzed by the section supervisor, with the results of the investigation submitted to the CHOand Enterprise Risk Management. Those involving personal injury must be reported in accordance with Alamo Colleges District and Palo Alto College Policies and Procedures. The Science Department should ensure spill control kits are available for commonly used chemicals in the area.

1. Major Spills - In the event of a major spill, evacuate the area and immediately contact the supervisor, administration, ACPD, ERM and the appropriate emergency response agency. Major chemical spill cleanup should be conducted by an approved EHS vendor and/or emergency response agency.

2. Minor Spills, Solid, Low Toxicity - Verify toxicity using the SDS. If low toxicity, sweep into a dust pan and place in a suitable container. Then notify the supervisor, ACPD, ERM and Facilities. Use appropriate protective equipment and clothing to minimize chemical exposure during any spill clean-up.

3. Minor Spills, Liquid - Contain the spill with absorbents (paper towels, absorbent pads, etc.) then follow the relevant instructions below. If in doubt, call the supervisor and/or ERM or check the SDS. Use appropriate protective equipment and clothing to minimize chemical exposure during any spill cleanup. Spill control kits are available commercially for many common types of spills. If a kit is available, use the instructions for clean-up contained in the kit.

    a. Inorganic Acids or Bases - Neutralize with appropriate chemical and place in suitable container for disposal. Notify the supervisor, administration, CHO, CCRM,ACPD, ERM and the appropriate emergency response agency as needed.

    b. Flammable Liquids - Immediately turn off all flames and heat sources. Ventilate area. Absorb liquid with absorbent pad and place in a suitable container for disposal. Notify the supervisor, administration, CHO, CCRM, ACPD, ERM and the appropriate emergency response agency as needed.

C. Personnel Exposure

In cases of severe chemical exposure, dial 210-485-0911, immediately. All accidents or near misses shall be documented and carefully analyzed by the supervisor, CHO, CCRM and/or ERM, with the results of the investigation submitted to the administration and ERM.

1. Routes of exposure

a. Inhalation

(1) Inhalation of toxic vapors, mists, gases, or dusts can produce poisoning by absorption through the mucous membrane of the mouth, throat, and lungs and can seriously damage these tissues by local action. Inhaled gases or vapors may pass rapidly into the capillaries of the lungs and be carried into the capillary system. This absorption can be extremely rapid. The rate will vary with the concentration of the toxic substance, its solubility in tissue fluids, the depth of respiration, and the amount of blood circulation, which means that it will be much higher when the person is active than when he or she is at rest.

(2) The degree of injury resulting from inhalation of toxic chemicals depends on the toxicity of the material and its solubility in tissue fluids, as well as on its concentration and the duration of the exposure.

b. Ingestion

(1) Many chemicals may damage the tissues of the mouth, nose, throat, lungs, and gastrointestinal tract and produce systemic poisoning if absorbed through the tissues.

(2) Before eating, smoking, or applying cosmetics, laboratory workers should immediately wash their hands upon leaving the laboratory or working with chemicals to prevent entry of toxic chemicals into the mouth.

c. Skin and Eye Contact

(3) A common result of skin contact is a localized irritation, but an appreciable number of materials are absorbed through the skin with sufficient rapidity to produce systemic poisoning. The main portals of entry for chemicals through the skin are the hair follicles, sebaceous glands, sweat glands, and cuts or abrasions of the outer layers of the skin. The follicles and glands are abundantly supplied with blood vessels which facilitates the absorption of chemicals into the body.

(2) Contact of chemicals with the eyes is of particular concern because these organs are so sensitive to irritants. Few substances are innocuous in contact with the eyes; most are painful and irritating, and a considerable number are capable of causing burns and loss of vision. Alkaline materials, phenols, and strong acids are particularly corrosive and can cause permanent loss of vision. Also, eyes are very vascular and provide for rapid absorption of many chemicals.

d. Injection

This route of exposure seldom occurs in the laboratory; however, it can inadvertently occur through mechanical injury from glass or other sharps.

2. Indicators of exposure

a. Signs (Observable by others)

(1) Changes in skin complexion; skin discoloration

(2) Lack of coordination

(3) Changes in speech pattern

(4) Changes in demeanor

(5) Excessive salivation

(6) Breathing difficulties

(7) Coughing

(8) Behavior Changes

b. (Symptoms) Not observable by others

(1) Headaches

(2) Dizziness

(3) Blurred vision

(4) Cramps

(5) Irritation of eyes, skin, or respiratory tract

3. Emergency Procedures

a. Eye Contact - Immediately flush the eyes with a copious amount of water for at least 15 minutes. Hold the eye-lids apart to ensure adequate irrigation. Seek prompt medical attention.

b. Skin Contact - Remove contaminated clothing. Immediately flush the affected area with water. Wash the area with hand soap or mild detergent to remove any residual contamination. Seek prompt medical attention.

c. Ingestion - Refer to the SDS for appropriate first aid procedures. Seek prompt medical attention.

d. Inhalation - Move the employee away from the exposure and into fresh air. Begin artificial respiration if breathing has stopped and use CPR if the heart has stopped and if trained to do so. Seek prompt medical assistance.

4. Emergency Eyewash and Shower

a. Conduct weekly inspections of all emergency eyewash and shower units.

1. Activate the flow of water by pushing/pulling the handle for the eyewash and pulling the hanging lever for the shower.

2. Keep the handle and lever in the open position long enough to verify operation and ensure that flushing fluid (water) is available.
3. Ensure an adequate controlled flow of flushing fluid (water) is provided to both eyes and face simultaneously at a velocity low enough to be non-injurious to the user.
4. Ensure the nozzles are free from dust, debris, and/or other obstructions;
5. Clean and sanitize all eyewash nozzles and shower heads that are rusted, corroded, and filled with dust/debris. Rinse the nozzles to remove all sanitizing residual.
6. Ensure the protective covers are placed on eyewash nozzles. Clean/sanitize any covers that are dirty. Replace covers that are missing on the eyewash nozzles.
7. Ensure flushed fluid (water) is captured in a container. Mop-up any water that spill onto the floor.
8. Ensure all parts are in good condition and operable.

b. The individual performing the test shall initial and date the inspection tag attached to each eyewash/shower unit.

c. Submit a work order to Facilities for any eyewash/shower that does not pass the weekly test for immediate repair.

5. Engineering Controls

a. Ventilation - All labs shall be maintained under negative pressure:

1. The movement of air must be from areas of lower contamination potential (i.e., corridors) to areas of higher contamination potential (laboratories).
2. Exhaust air from the laboratory hoods and work areas shall be discharged outdoors in such a manner as to prevent re-entrance of contaminants into the building's air supply.
3. Facilities should provide the required maintenance of the ventilation systems.

b. Ventilation Failure

1. Notify the Supervisor, CHO, ERM and facilities in all case of a ventilation system malfunction in the labs.
2. Terminate operations in a safe manner, to include the closing of compressed gas cylinders, the closing of volatile/flammable/combustible chemicals, and the closing of all hood sashes.
3. During an actual emergency, evacuate the labs, closing all doors behind you.
4. Do not re-enter the labs until ventilation has been restored for 30 minutes.
5. ERM and the appropriate agencies shall perform air monitoring as needed to determine if the atmosphere in the labs is safe and/or unsafe.
6. All laboratories must be negative to halls and chemical storage rooms must be negative to other parts of the laboratory.

c. General Practice - Engineering controls including hoods, local exhaust ventilation and substitution of less toxic chemicals should be used to minimize exposure to all hazardous chemicals in the laboratory.

d. Laboratory operations which involve chemicals with a PEL or TLV of 100 ppm or less (gas or vapor) or 0.1 mg/m^3 or less (aerosol) will be planned and conducted using appropriate engineering controls. High-risk operations will be conducted inside primary containment, i.e., lab hoods. Low-risk operations where the potential for generation of gas, vapor or aerosol contamination is remote may be conducted on the open bench.

e. Lab Hoods - The following work practice will be used to ensure adequate hood performance:

1. Work with the hood sash closed as much as possible during the operation. Do not place your head inside the hood.
2. Keep all apparatus and containers at least 8 inches behind the face of the hood to minimize spillage from the hood.
3. Keep the slot in front of the lower hood baffle free from obstructions. Elevate all necessary apparatus and equipment.
4. Do not store chemicals or hazardous waste inside the hood. Use an approved storage cabinet or satellite storage locations.
5. Minimize pedestrian traffic past the open face of the hood. This may cause spillage of contaminants if the air turbulence which is created disrupts the flow of air at the hood face and within the hood.
6. Fans in the immediate area of the hood should be turned off during use of a hood as the airflow may also increase air turbulence sufficiently to cause fume leakage.
7. Annual certification on each lab hood should be performed by an approved environmental health vendor. A sticker shall be placed on each lab hood the pass the annual certification by the vendor.
8. Facilities is responsible for repairing any mechanical malfunctions in each lab hood.
9. The supervisor, CHO, CCRM and/or designated representative should verify operation of the hoods before beginning work; therefore, a visual device must be present on all hoods. This may be a string or velometer to depict inward movement.
10. The hoods are to be kept closed except when in use. It is advisable to leave the hood "on" when it is in active use, if toxic substances are stored in it, or if it is uncertain as to whether or not adequate general laboratory ventilation will be maintained if turned "off".

IV. CHEMICAL PROCUREMENT, STORAGE, AND DISPOSAL

A. Chemical Procurement

Texas Health and Safety Code 502, 29 CFR 1910.1200 and 1910.1450 require that each employee and/or student are provided information on proper handling, storage and disposal before a chemicals are received. No container should be accepted without an adequate identifying label.

1. Safety Data Sheets (SDS) must be on file for all chemicals on hand. Safety Data Sheets shall be maintained in the MSDSonline System. Safety Data Sheets should be obtained directly from the manufacturer of the chemical or by requesting them in the MSDSonline System.
2. New Chemicals - Newly acquired chemicals must be recorded on the workplace chemical inventory list. Receipt of an SDS will be verified and a copy placed in the in the SDS binder and/or input into the online SDS program.
3. Laboratory Technicians and their Supervisors shall practice proper hazardous waste management by reducing the amount of hazardous chemicals procured and stored at PAC. Reduced levels of chemical procurement and storage minimizes the amount of hazardous waste generated, and lessens the possibility of a serious accident involving chemicals.

B. Chemical Storage

1. General - Storage of chemicals should be minimized. Do not order large quantities of chemicals in advance. The following guidelines will be observed:

    a. Chemical Inventory - All chemicals must be inventoried on the Workplace Chemical List (Appendix D) or by another appropriate method of tracking chemical inventories. Each workplace/lab is responsible for their inventory.

        (1) Each laboratory shall inventory all its chemicals on an annual basis or as new chemicals are brought into the laboratory. The Laboratory Technicians are responsible for this chemical inventory list.

        (2) The inventory shall list the actual chemical name, quantity on hand, and storage locations (include building and room numbers) within the laboratory. The inventory shall also include other important information to assist in identifying hazards, storage requirements and disposal requirements of each chemical.

        (3) Chemicals that are peroxide forming shall be noted on the inventory list.

        (4) The Lab Tech shall maintain copies of the complete chemical inventory lists with the (Right-To-Know) SDS in a binder and/or the MSDSonline System for each laboratory. The binder and/or the online SDS program shall be made accessible to employees, students and emergency responders in case of an actual emergency.

b. Every chemical must be clearly labeled with its chemical name, hazard statements, precautionary statements, GHS pictograms (See appendix F) and manufacturer's information. Labels can be created using the MSDSonline System or by request to the Chemical Hygiene Officer.

c. Do not store ("Prohibited") chemical on (open) top shelves above head level and/or in lab hoods.

d. The Laboratory Technician should routinely check all chemical containers, properly dispose of all excess chemicals, corroded containers, and any that have exceeded their specified expiration dates.

e. Place the chemical container into a secondary container when hand carrying reagents between laboratory areas or to the laboratory areas from storage/prep areas.

f. Stockrooms/storerooms shall not be used for preparing or repackaging chemicals.

g. Store all chemicals away from direct sunlight.

h. Always place compatible chemicals together in the storage area. See SDS for chemical incompatibilities.

i. Store chemicals that are highly corrosive, toxic, or other chemicals whose spillage could cause a serious hazard or difficult cleanup in unbreakable secondary containers or in an appropriate spill pan with absorbent material.

j. Peroxide forming chemicals have special storage requirements. See appendix E.

2. Bloodborne Pathogens - Regulated Medical Waste (RMW), also known as 'biohazardous' waste or 'infectious medical waste, is the portion on the waste stream that may be contaminated by blood, body fluids or other potentially infectious materials (OPIM), thus posing a significant risk of transmitting infection. The OSHA standard 29 CFR 1910.1030, Bloodborne Pathogens provides additional guidance.

a. Each sharps container must either be labeled with the universal biohazard symbol and the word "biohazard" or be color-coded red.
b. Sharps containers must be maintained upright throughout use, replaced routinely, and not be allowed to overfill. Also, the containers must be:

Closed immediately prior to removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping;

1) Placed in a secondary container if leakage is possible. The second container must be:
   - Closable;
   - Constructed to contain all contents and prevent leakage during handling, storage, transport, or shipping; and
2) Labeled or color-coded according to the standard.

3) Reusable containers must not be opened, emptied, or cleaned manually or in any other manner that would not expose employees to the risk of percutaneous injury.
4) Upon closure, duct tape may be used to secure the lid of a sharps container, as long as the tape does not serve as the lid itself.
5) Red bags or red containers may be used.

3. Flammable and Combustibles - CAUTION: Use heating mantles, not Bunsen burners, for heating flammable and combustible chemicals.

   a. Store all flammable and combustible chemicals and liquids in approved flammable storage cabinets.

   b. Laboratory staff should not store more than a two week supply of flammable or combustible liquids in a lab.

   c. Store all flammable and combustible liquids in approved (flammable cabinets) glass, metal or plastic containers.

   d. Store flammable (Class I) and combustible (Class II) liquids in approved safety cans when the container quantity exceeds 2 gallons in a safety cabinet.

   e. Bulk quantities of flammable or combustible liquids will be stored in the flammable storage area. Transfer Class I liquids to smaller containers (not exceeding 2 gallons in capacity) from bulk containers under a chemical hood or in an approved inside storage room. The transfer of Class I liquids from bulk containers exceeding 2 gallons shall be conducted in an approved inside storage room or outdoors. Do not transfer Class I liquids between metal containers unless the containers are electrically bonded.

   f. Store refrigerated flammable liquids in explosion-proof or "laboratory safe" refrigerators and freezers.

   g. Ethers must be used only in a working explosion proof fume hood from which all possible ignition sources have been removed.

   h. Automated equipment shall be operated at least five (5) feet from storage of flammable and combustible materials, unless separated by a fire wall.

4. Acutely Toxic Chemicals, Carcinogens, Reproductive Toxins, Sensitizers and Irritants
   Exposure to toxic chemicals can occur by:
   - Inhalation
   - Dermal Absorption
   - Ingestion
   - Injection

a. Acutely toxic compounds, carcinogens, and reproductive toxins should be segregated from other chemicals and stored in a well-ventilated area. When available, ventilated cabinets will be used for storage.

b. The words "DANGER – CHEMICAL CARCINOGEN", "CAUTION – CANCER SUSPECT AGENT' or "CAUTION – TOXIC AGENTS" should be posted on these cabinets as appropriate.

1) **Acute Toxins:** Acute toxins can cause severe injury or death as a result of short-term, high level exposure. Examples of acute toxins include the following:

- Hydrogen cyanide
- Hydrogen sulfide
- Nitrogen dioxide
- Ricin
- Organophosphate pesticides
- Arsenic

Do not work alone when handling acute toxins. Use a fume hood to ensure proper ventilation.

2) **Chronic Toxins -** Chronic toxins cause severe injury after repeated exposure. Examples of chronic toxins include the following:

- Mercury
- Lead
- Formaldehyde

3) **Carcinogens -** Carcinogens are materials that can cause cancer in humans or animals. Examples of known carcinogens include the following:

a. Several agencies including OSHA, NIOSH, and IARC are responsible for identifying carcinogens.

b. There are very few chemicals known to cause cancer in humans, but there are many suspected carcinogens and many substances with properties similar to known carcinogens.

- Asbestos
- Benzene
- Tobacco smoke
- Chromium, hexavalent
- Aflatoxins

c. Zero exposure should be the goal when working with known or suspected carcinogens. Workers who are routinely exposed to carcinogens should undergo periodic medical examinations.

4) **Reproductive Toxins -** Reproductive toxins are chemicals that can produce adverse effects in parents and developing embryos:

a. Chemicals including heavy metals, some aromatic solvents (benzene, toluene, xylenes, etc.), and some therapeutic drugs are capable of causing these effects. In addition, the adverse reproductive potential of ionizing radiation and certain lifestyle factors, including excessive alcohol consumption, cigarette smoking, and the use of illicit drugs, are recognized.

b. While some factors are known to affect human reproduction, knowledge in this field (especially related to the male) is not as broadly developed as other areas of toxicology. In addition, the developing embryo is most vulnerable during the time before the mother knows she is pregnant. Therefore, it is prudent for all persons with reproductive potential to minimize chemical exposure. A partial list of reproductive toxins is depicted in the table below:

Reproductive Toxins	
Acrylontrile	Carbon disulfide
Benzene	Chloroform
Benzo(a)pyrene	Sodium azide
Cadmium nitrate	Warafin

5) **Sensitizers -** Sensitizers may cause little or no reaction upon first exposure. Repeated exposures may result in severe allergic reactions. Examples of sensitizers include the following:

- Isocyanates
- Nickel salts
- Beryllium compounds
- Formaldehyde
- Diazomethane

6) **Irritants:** Irritants cause reversible inflammation or irritation to the eyes, respiratory tract, skin, and mucous membranes. Irritants cause inflammation through long-term exposure or high concentration exposure. For the purpose of this section, irritants do not include corrosives. Examples of irritants include the following:

- Ammonia
- Formaldehyde
- Halogens
- Sulfur dioxide
- Poison ivy

- Phosgene

c. Acutely toxic compounds, carcinogens, or reproductive toxins will be placed in an unbreakable secondary container prior to transport through the laboratory. The secondary container should contain absorbent material to cushion the primary container and absorb the contents in the event of a spill. Secondary containers will be appropriately labeled.

5. Compressed Gases

a. Keep the protective valve cap on the cylinder whenever it is not in service or being moved/transported.

b. Transport and/or move compressed gas cylinders in approved hand truck that are properly secured. Strap the gas cylinder in place on the truck with the valve protector cap installed. Move only one cylinder at a time unless the hand truck is designed for multiple cylinders.

c. Secure all gas cylinders in the upright position by a chain, strap, or cylinder stand. Do not bring gas cylinders into the laboratory until they are to be used. Clearly label or identify on a tag the contents of each cylinder. Turn off cylinder valves when gas is not being used. Use the regulator valve only to adjust the flow rate or pressure during use. Use only recommended regulators fittings and tubing; never use an adapter to connect a regulator designed for another gas. Keep regulators clean. Never permit oil, grease, or other petroleum products to contaminate any cylinder regulator.

d. Do not expose gas cylinders to temperatures above 125^{o} F. Do not store gas cylinders near sources of ignition/heat or open flames. If gas cylinders are stored outdoors, locate them in a sheltered area protected from the elements.

e. Post areas where hydrogen or other flammable gases are stored: "DANGER--FLAMMABLE GAS. NO SMOKING OR OPEN FLAMES WITHIN 50 FEET."

f. Segregate gas cylinders by their classification (i.e., flammable, toxic or oxidizer). Separate oxidizers from flammable gases by at least 50 feet unless a 1/2-hour fire-rated partition is used to separate them.

g. Label gas cylinders, when empty, with a tag or a piece of tape marked "Empty." Store full and empty gas cylinders in separate locations of the storage area.

6. Special: Shock Sensitive Chemicals.

a. Unless the manufacturer has added an inhibitor, unopened containers of shock sensitive chemicals must be turned in after 12 months of storage to be disposed of as a hazardous chemical. Opened containers must be turned in after 6 months of storage. Shock sensitive chemicals must also be prominently noted on the chemical inventory.

C. Chemical Disposal

1. The Laboratory Technician is responsible for the handling, storage and proper chemical and waste disposal.

2. Manage the handling, storage of chemicals, regulated medical waste and hazardous waste until proper disposal can be arranged.
   a. Collect the hazardous waste in a leak-proof primary container. The container must be marked with the words "Hazardous Waste" or other words that identify its contents.
   b. Some chemicals may be rendered harmless and disposed of in the laboratory. Render laboratory wastes and hazardous materials containing reducing agents, oxidizing agents, acids, and bases innocuous prior to discharge into the sanitary sewer.
   c. The Lab Tech shall make arrangements with the approved environmental health vendor (under contract with the District) for the proper removal and disposal of hazardous chemical and waste from each laboratory. Upon request, ERM can assist with the vendor.
3. Guidelines for the identification of hazardous chemical wastes are listed in Title 40 (EPA) CFR, Part 261-266. If in doubt, contact the supervisor, EHS/ERM and/or the approved chemicals waste disposal vendor.

4. Segregate all laboratory chemicals and hazardous material waste into the following classifications:

a. Corrosive	Acid (less than 2 pH)
b. Corrosive	Base (greater than 12.5 pH)
c. Flammable	Solid
d. Flammable	Liquid (flash point less than 100° F)
e. Combustible	Liquid (flash point been 100° and 200° F)
f. Oxidizer	
g. Organic peroxide	
h. Poison	
i. Irritant	

5. Mixed or inseparable waste streams should be segregated into organic, inorganic or halogenated classifications as appropriate.

6. The Lab Tech shall forward a copy of the transportation and final manifest generated by the vendor to the CHO and the CCRM.

7. The CHO shall maintain a copy of the transportation and final manifest generated by the vendor for 5 years. Forward a copy of the final manifest to the CCRM and ERM.

V. PREVENTIVE MEDICINE PROGRAMS

A. Medical Surveillance

Notify Enterprise Risk Management and a Supervisor immediately in the following circumstances:

1. All work related injuries and exposure.

2. ERM will work with each employee concerning workers' comp requirements and benefits.

3. Whenever an employee develops signs or symptoms associated with a hazardous chemical exposure in the laboratory.

4. Whenever there is reason to suspect a potentially hazardous chemical exposure (i.e. poor ventilation in an area where chemicals are used).

5. Actual chemical spills involving exposure to employees and/or students.

6. When indoor air monitoring reveals an exposure level routinely above the action level or PEL for an OSHA regulated substance.

7. Reproductive Hazards. Reproductive hazards should not be routinely used.
   a. The supervisor should notify both employees and students of child-bearing age if they will be working with reproductive hazards in the laboratory. A pregnant employee and her unborn child should not be endangered by the work assignment.

   b. Pregnant employee and/or student should notify their supervisor and/or professor by a positive pregnancy test if they will be working with reproductive hazards.

   c. The supervisor shall should work with the employee and/or student to ensure they can safely work in this environment with the appropriate PPE as needed.

   d. If the employee and/or student requests a change in her work assignment, after consulting with their own physician, then every reasonable effort should be made to accommodate their request.
   e.
   f. The supervisor may request medical documentation as to the nature of the limitations recommended by her physician

Appendix A - References

1. American National Standard Institute (ANSI) Standard Z87.1: Practices for Occupational and Educational Eye and Face Protection.

2. ANSI Standard Z358.1: Emergency Eyewash and Shower Equipment.

3. American Society of Heating Refrigerating and Air Conditioning Engineering (ASHRAE) 110-1995, Method of Testing Performance of Laboratory Fume Hoods

4. National Fire Protection Association (NFPA) 30, Flammable Liquids Code.

5. NFPA 45, Standard for Fire Protection for Laboratories Using Chemicals.

6. Texas Administrative Code, Title 25, Part 1, Chapter 295, Occupational Health.

7. Occupations Safety and Health Administration (OSHA) 29, Code of Federal Regulations (CFR), Part 1910.106, Flammable and Combustible Liquids.

8. Texas Health and Safety Code 502, Hazard Communication Act

9. 29 CFR, Part 1910.1200, Hazard Communication.

10. 29 CFR, Part 1910.1030, Bloodborne Pathogens.

11. 29, CFR, Part 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories.

12. Environmental Protection Agency (EPA) 40, CFR, Part 261, Identification and Listing of Hazardous Waste.

13. 40, CFR, Part 262, Standards Applicable to Generators of Hazardous Waste.

14. The International Code Council (ICC), International Fire Code(IFC), Chapter 38, Higher Education Laboratories, 2018 Edition.

Appendix B – Definitions of Terms

1. Action Level. A concentration designated in 29 CFR, Part 1910, for a specific substance, calculated as an 8-hour time-weighted average (TWA). For other hazards, it is designated as one half of the PEL or TLV. This is the level at which certain required interventions, such as exposure monitoring and medical surveillance, are generally recommended.

2. Acutely Toxic. A chemical falling within any of the following toxicity categories:

    a. A median lethal dose (LD_{50}) of 50 milligrams per kilogram (mg/kg) of body weight or less when administered orally to rats

    b. An LD_{50} of 200 mg/kg of body weight or less when administered to the skin of rabbits.

    c. A median lethal concentration (LC_{50}) in air of 200 parts per million (ppm) or less of gas or vapor or 2 mg/liter or less of mist, fume, or dust when administered by inhalation to rats.

3. Carcinogen. An undiluted chemical or mixture of chemicals which contains at least 1 percent of a chemical which meets one of the following criteria:

    a. It is regulated by OSHA as a carcinogen.

    b. It is a human carcinogen listed under the category "KNOWN TO BE CARCINOGENS," in the latest edition of the Annual Report on Carcinogens by the National Toxicology Program (NTP).

    c. It is listed under Group I, "CARCINOGENIC TO HUMANS," by the latest edition of the International Agency for Research on Cancer (IARC).

    d. It is listed in either Group 2A or 2B by IARC or under the category "reasonably anticipated to be carcinogens" by NTP.

    e. It is a military-unique compound classified as a carcinogen by USAEHA or the Office of the Surgeon General (OTSG).

4. Combustible Liquid. Any liquid having a flash point at or above 100 degrees Fahrenheit (F) but below 200 degrees F, except mixtures having components with flash points of 200 degrees F or higher, the total volume of which makes up 99 percent or more of the mixture.

5. Compressed Gas. A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 pounds per square inch (psi) at 70 degrees F, or a gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 degrees F regardless of the pressure at 70 degrees F.

6. Explosive. A chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

7. Flammable Aerosol. An aerosol that, when tested by the method prescribed in 16 CFR 1500.45, yields flame projection exceeding 18 inches at full valve opening or a flashback at any degree of valve opening.

8. Flammable Gas. A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or a gas that at ambient temperature and pressure forms a range of flammable mixtures with air wider than 12 percent by volume, regardless of the lower limit.

9. Flammable Liquid. A liquid having a flash point below 100 degrees F, except any mixture having components with flash points of 100 F or higher, the total of which make up 99 percent or more of the total volume of the mixture. Also known as a Class I liquid. These are further divided into:

    a. Class 1A, which includes liquids having flash points below 73 degrees F and boiling points below 100 degrees F.

    b. Class 1B, which includes liquids having flash points below 73 degrees F and boiling points at or above 100 degrees F.

    c. Class 1C, which includes liquids having flash points at or above 73 degrees F but below 100 degrees F.

10. Flash Point. The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested using the Tagliabue Closed Tester, the Pensky-Martens Closed Tester, or the Setaflash Closed Tester.

11. Hazardous Chemical. Any chemical which is a physical hazard or health hazard.

12. Hazardous Waste. A substance regulated by the Resource Conservation and Recovery Act (RCRA) and defined in 40 CFR 261.3.

13. Health Hazard. A chemical for which there is statistically significant evidence, based on at least one study conducted in accordance with established scientific principles, that acute or chronic health effects may occur in exposed employees. The term includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive damaging toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes. Also included are any unique or proprietary formulation for which there is insufficient data available to determine its health effects should be considered to have similar health effects as other members of the same generic chemical class.

14. Laboratory Scale. Laboratory scale means work with substances in which the container used for reactions, are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials-

15. Oxidizer. A chemical, other than a blasting agent or explosive as defined in 29 CFR 1910.109(a), that initiates or promotes combustion in their material, thereby causing fire either by itself or through the release of oxygen or other gases.

16. Permissible Exposure Limit. An occupational standard promulgated by OSHA as a regulatory requirement. The PEL can be an 8-hour TWA, a ceiling value, or a 15-minute short time exposure limit (STEL).

17. Physical Hazard. A chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, a flammable compound, an organic peroxide, an oxidizer, a pyrophoric substance, an unstable (reactive) substance, or a water-reactive substance.

18. Reproductive Toxin. A chemical which affects the reproductive system and/or may produce chromosomal damage (mutations) and/or adverse effects on the fetus (teratogenesis). For the purposes of this guidance, any chemical with a mutagenic or teratogenic quotation in the Registry of Toxic Effects of Chemical Substances (RTECS) shall be considered a reproductive hazard.

19. Short Term Exposure Limit. This value is the maximum concentration to which workers can be continuously exposed for a period up to 15 minutes without suffering from: irritation, chronic or irreversible tissue change, or narcosis of sufficient degree to increase accident proneness, impair self-rescue, or materially reduce work efficiency.

20. Threshold Limit Value. Airborne concentrations of substances, published by American Conference of Governmental Industrial Hygienists (ACGIH), to which workers may be exposed day after day with no adverse effect. The TLV's are advisory in nature; however, Department of the Army (DA) policy uses the TLV as regulatory policy when the TLV is more stringent than the PEL for a specific chemical.

21. Toxic Chemical. Element, compound, or mixture that can cause injuries by direct chemical action on body cells, tissues, and organs. A chemical falling within any of the following toxicity categories:

    a. An LD_{50} of more than 50 mg/kg, but not more than 500 mg/kg, of body weight when administered orally to rats.

    b. An LD_{50} of more than 200 mg/kg, but not more than 1000 mg/kg, of body weight when administered to the skin of rabbits.

    c. An LC_{50} in air of more than 200 ppm but not more than 2,000 ppm, of gas or vapor or more than 2 mg/liter, but not more than 20 mg/liter, of mist, fume, or dust when administered by inhalation to rats.

Appendix C – Known or Suspected Carcinogens

Chemical	Standard	PEL (TWA)
Asbestos	1910.1001	0.2 fibers/cc
Benzene	1910.1028	1 ppm
4-Nitrcphenyl	1910.1003	No exposure permitted by any route.
1-Naphthylamine	1910.1004	No exposure permitted by any route.
Methyl Chloromethyl ether	1910.1006	No exposure permitted by any route.
3, 3'-Dichlorobenzidine (and salts)	1910.1007	No exposure permitted by any route.
bis-Chloromethyl ether	1910.1008	No exposure permitted by any route.
2-Naphthylamine	1910.1009	No exposure permitted by any route.
Benzidine	1910.1010	No exposure permitted by any route.
4-Aminodiphenyl	1910.1011	No exposure permitted by any route.
Ethyleneimine	1910.1012	No exposure permitted by any route.
beta-Propiolactone	1910.1013	No exposure permitted by any route.
2-Acetylaminofluozene	1910.1014	No exposure permitted by any route.
4-Dimethylaminoazobenzene	1910.1015	No exposure permitted by any route.
N-Nitrosodimethylamine	1910.1016	No exposure permitted by any route.
Vinyl chloride	1910.1017	1 ppm

inorganic Arsenic	1910.1018	10 ug/m^3
Coke oven emissions	1910.1029	150 ug/m^3
1, 2-Dibromo-3-chloro-propane	1910.1044	1 ppb
Acrylonitrile	1910.1045	2 ppm
Ethylene oxide	1910.1047	1 ppm
Formaldehyde	1910.1048	1 ppm

Appendix D - Management of Peroxide Forming Chemicals

The laboratories on campus might procure, store or use chemicals/solvents that are susceptible to peroxide formation. Auto-oxidation may occur under normal storage conditions as these materials typically react with air, moisture, or impurities to produce potentially dangerous peroxide by-products. Peroxides are highly reactive and can explode upon shock, friction, or spark. Since the peroxides are less volatile than the solvent itself, they tend to concentrate. It's important to note that distillation and evaporation increases the danger of peroxide formation.

Considerations when storing and using peroxide-forming chemicals:

- Label containers with date received, dater first opened and recommended disposal date.
- Keep an inventory of all chemicals including which ones are potential peroxide forming. Include the recommended disposal date in the record of each peroxide forming chemical.
- Keep containers tightly closed
- Keep opaque containers stored in areas away from light sources
- Purchase the right size container. This ensures the entire use of the contents within a short period of time.
- Inventory all chemicals in storage at least once a year to eliminate the forgotten items and leaking containers.
- Refrigeration does not stop or inhibit peroxide formation.
- If possible, purchase only chemicals that contain an additive that retards the formation of peroxides. Generally, the label will note their presence.
- Know the properties and dangers of the chemicals you are working with. Read and review the SDS.

Detection of Peroxides

The easiest method to detect peroxides is to use peroxide test strips. These strips will change color to indicate the presence of peroxides. When using these test strips, follow the manufacturer instructions.

If there is a question or suspicion that peroxides >100 ppm are present in a container. DO NOT OPEN, USE, or OTHERWISE DISTURB MATERIAL. Solid crystals may form on the outside of the containers especially around the caps. If you see this, place a sheet of paper at or near the container marked "Do Not Use" and contact Enterprise Risk Management as soon as possible. Extreme care must be exercises when handling.

<25 ppm	Consider safe for use
>25 ppm <100 ppm	Safe for use; however, do not distill or concentrate
>100pm	Do not use, contact Enterprise Risk Management for disposal.

**Although chemicals are generally safe to use if the peroxide level are <100 ppm, it is recommended by College Services that you consider arranging for disposal once peroxides are detected at any level. This will ensure the chemical will not be "forgotten" and pose a more serious safety threat in the future.

If you do not suspect peroxides but the chemical is listed in one of the groups noted below or otherwise known to be a peroxide forming chemical, it should be tested prior to use to ensure no peroxides have formed. Some bottles will have an expiration date; it is important to either dispose of the material once this date is exceeded or test for peroxides before each use.

Common Peroxides Forming Chemicals and Retention Time
Peroxide forming chemicals are categorized into groups depending on peroxide formation susceptibility. *Note: The following lists are not all inclusive!*

Group A: Chemicals that Form Explosive Levels of Peroxides without Concentration
These present a severe peroxide hazard after prolonged storage, especially after exposure to air. Test for peroxide formation before using or discard after 3 months:

- Divinyl acetylene
- Divinyl ether
- Isopropyl ether
- Potassium metal
- Sodium amide
- Vinylidene chloride

Group B: Chemicals that Form Peroxide Hazards on Concentration
Test for peroxide formation before distillation or evaporation. Also test for peroxide or discard after one year:

- Acetyl
- Benzyl alcohol
- Chlorofluoroethylene
- Decahydronapthalene(decalin)
- Diglyme
- Ethylene glycol ether acetates
- 4-Heptanol
- Methyl Acetylene
- 3-methyl-1-butanol
- 2-Pentanol
- **1**-Phenylethanol
- Tetrahydronapthalene
- Sec. alcohols
- Acetaldehyde
- 2-Butanol Dioxanes
- Cumene (isoproplybenzene)
- Diacetylene (butadiyne)
- Dicyclopentadiene
- Diethyl ether (ethyl ether)
- Furan
- 2-Hexanol
- 4-methyl-2-pentanol
- Methyl-isobutyl-ketone
- 4-penten-1-01
- Tetrahydrofuran
- Vinyl ethers

Group C: Chemicals that are Hazardous Due to Peroxide Initiation of Polymerization
Discard after one year:

- Acrylic acid
- Styrene

- Acrylonitrile
- Butadiene
- Chlorprene
- Chlorotrifluoroethylene
- Methyl methacrylate
- Tetrafluoroethyene
- Vinyl acetylene
- Vinyl acetate
- Vinyl chloride
- Vinyl pyridine

Labeling Peroxide Forming Bottles/Containers

Upon receipt, label the container with the date received, date first opened, and recommended disposal date. A label example is noted below and can be obtained through the College Services Coordinator of Risk Management. If it is necessary to perform a peroxide test, note the results in the appropriate space.

Caution: Peroxide Forming Chemical

Date Received: _____/_____/_____
Date Opened: _____/_____/_____
Date Expires: _____/_____/_____
Limited shelf life. Store tightly closed and away from light and heat.
Contact The College Services Coordinator of College Risk Management at 486-3944 for more information
Test Date: _____ Peroxide: _____ Tester:_____
Test Date: _____ Peroxide: _____ Tester:_____
Test Date: _____ Peroxide: _____ Tester:_____

Appendix E – Acute Toxicity Hazard Designation

Substances with a high degree of acute toxicity are those that can cause death, disability, or serious injury after a single, relatively low-level exposure. The following table denotes the OSHA defined toxicity designations, for various routes of exposures. The criteria for "highly toxic" appears in bold letters.

Acute Toxicity Hazard Designations OSHA Hazard Designation	Other Toxicity Rating[1]	Oral LD_{50} (rats, mg/kg)	Skin Contact LD_{50}[2] (rabbits, mg/kg)	Inhalation LC_{50}[3] (rats, ppm for 1 hr)	Inhalation LC_{50} (mg/m^3 for 1 hr)
Highly toxic	**Highly toxic**	**<50**	**<200**	**< 200**	**<2000**
Toxic	Moderately toxic	50 to 500	200 to 1000	200 to 2000	2000 to 20,000
	Slightly Toxic	500-5000	1000-5000	2000-20,000	20,000-200,000

[1] Prudent Practices in the Laboratory: Handling and Disposal of Chemicals; National Academy Press, Washington, D.C., 1995

[2] LD50- The amount of a chemical that when ingested, injected, or applied to the skin of a test animal under controlled laboratory conditions will kill one-half (50%) of the animals.

[3] LC50- The concentration of the chemical in air that will kill 50% of the test animals exposed to it.

Appendix F – Chemical Inventory

Chemical Name	Manufacturer	SDS Date	Location	Quantity

Appendix G – Glove Chart

Glove Chart

Type	Advantages	Disadvantages	Chemicals Protected Against
Latex	Low cost, excellent physical properties, dexterity, comfort	Allergy potential, may cut easily, may be dissolved by many organics	Oils, grease
Nitrile	Low cost, excellent physical properties, dexterity, can be cut resistant	DO NOT USE for methylene chloride, certain ketones	Oils, greases, most organics, weak acids and bases
Rubber	Low cost, dexterity	Poor choice for oils, grease, most organics	Bases, alcohols, dilute aqueous solutions
Polyvinyl chloride (PVC)	Low cost, good physical properties, medium chemical resistance	Poor choice for organics, limited physical dexterity, certain organics may dissolve	Strong acids and bases, aqueous solutions, alcohols
Polyvinyl alcohol (PVA)	Good physical properties, highly impermeable to gas,	Expensive, cannot be used in water or water based solutions	Aliphatics, aromatics, chlorinated solvents
Neoprene	Medium cost, medium chemical resistance	Not for some organics	Acid, bases, oils, phenol
Silver Shield	Excellent chemical resistance	Poor fit, not puncture resistant, stiff, poor grip	Metallic mercury, hazmat use

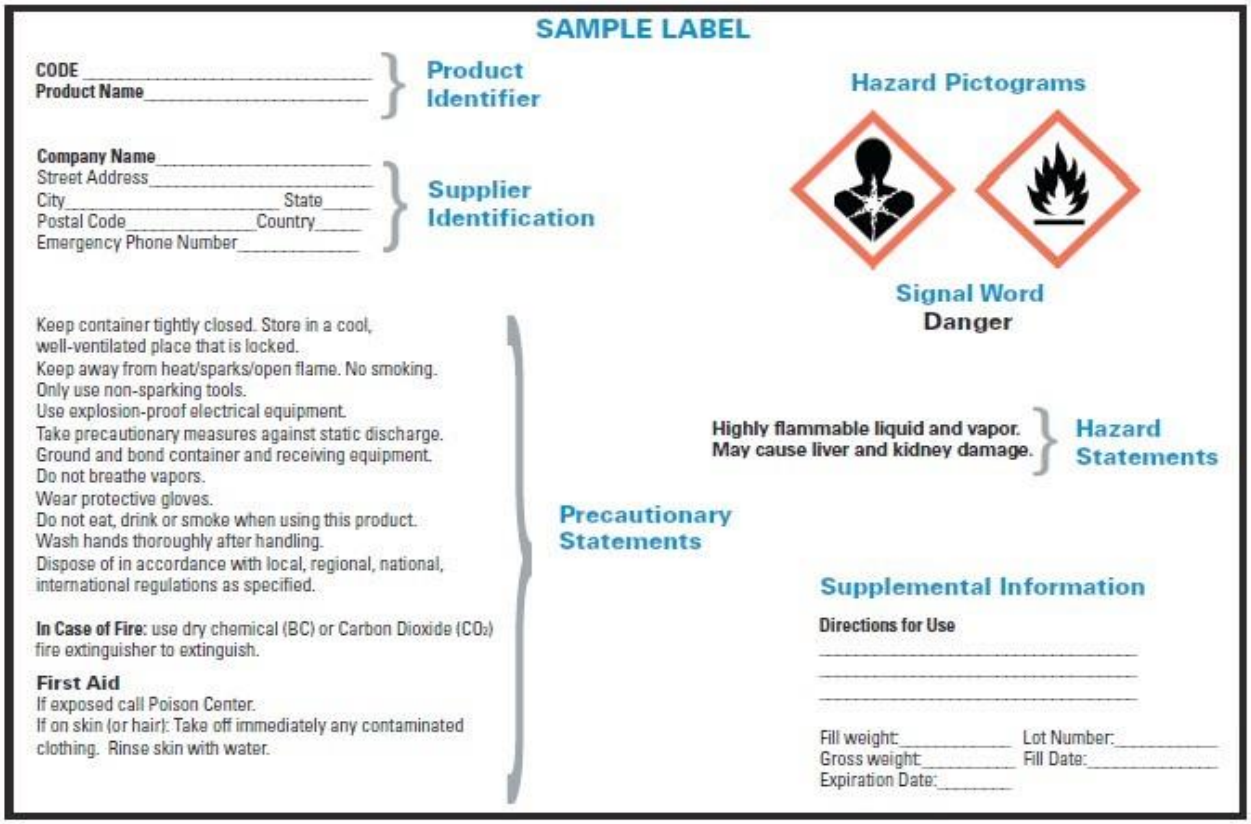
Appendix H: GHS Pictograms

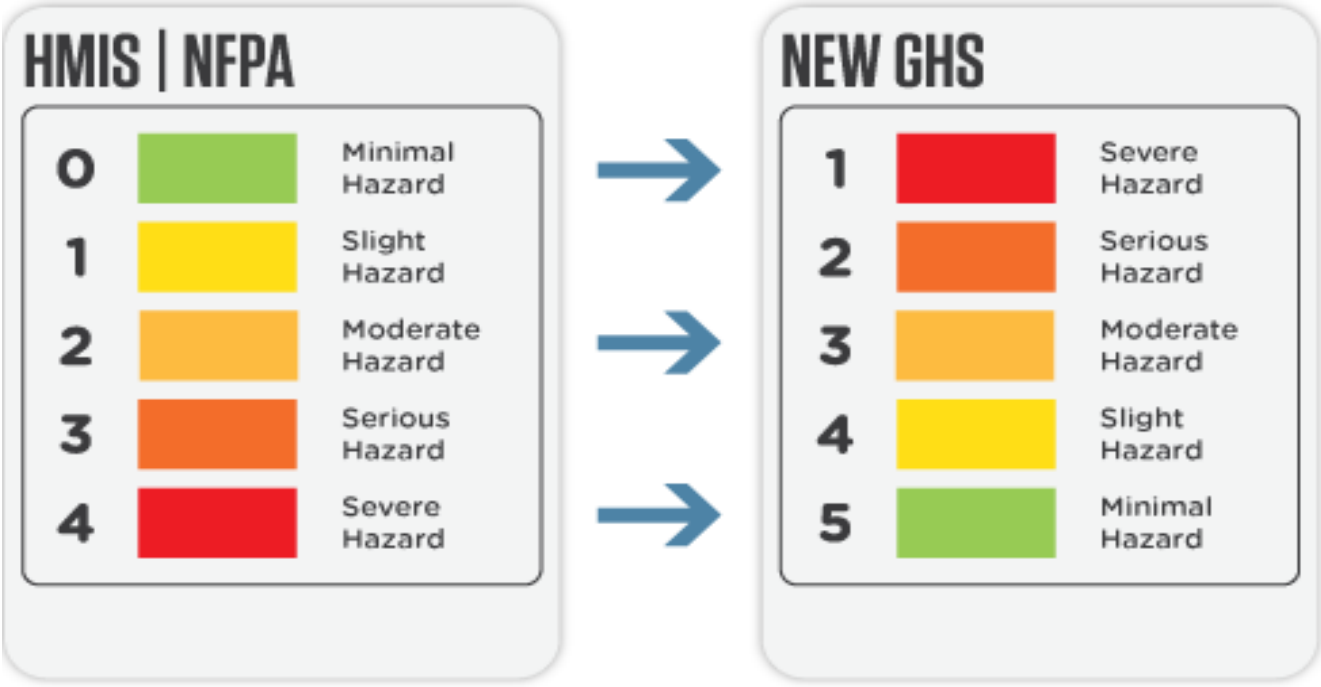
GHS Pictograms and Hazard Classes		
 • Oxidizers	 • Flammables • Self Reactives • Pyrophorics • Self-Heating • Emits Flammable Gas • Organic Peroxides	 • Explosives • Self Reactives • Organic Peroxides
 • Acute toxicity (severe)	 • Corrosives	 • Gases Under Pressure
 • Carcinogen • Respiratory Sensitizer • Reproductive Toxicity • Target Organ Toxicity • Mutagenicity • Aspiration Toxicity	 • Environmental Toxicity	 • Irritant • Dermal Sensitizer • Acute toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritation

APPENDIX I: GHS SAMPLE LABEL

Effective June 1, 2015, each container of a classified hazardous chemical is to be labeled, tagged, or marked with the following elements:

1. Product or chemical identifier clearly indicated on the label that matches the product or chemical identifier on the SDS;
2. Contact information for the product supplier, including the company name, address
3. Pictograms (see Appendix H - GHS Pictogram Descriptions) on labels to alert users of the chemical hazards to which they may be exposed. Each pictogram consists of a symbol on a white background framed within a red border and represents a distinct hazard(s). The pictogram on the label is determined by the chemical hazard classification.
4. A signal word, and hazard and precautionarystatements.
5. Supplemental information may also be provided on the label as needed.




HMIS | NFPA
0 Minimal Hazard
1 Slight Hazard
2 Moderate Hazard
3 Serious Hazard
4 Severe Hazard
NEW GHS
1 Severe Hazard
2 Serious Hazard
3 Moderate Hazard
4 Slight Hazard
5 Minimal Hazard

ALAMO COLLEGES DISTRICT

ENTERPRISE RISK MANAGEMENT

Fax completed form to: 210 486 9067
Email to lrueda1@alamo.edu or mlegg2@alamo.edu
Phone: 210-485-0065 or 210-485-0206

☐ DIST ☐ SAC ☐ SPC ☐ SWC ☐ PAC ☐ NVC ☐ NLC

EMPLOYEE'S INJURY REPORT

(to be completed by Injured Employee at the time of the injury unless emergency treatment is necessary)

NAME:			☐ **M** ☐ **F**
BANNER ID:	**SSN (last four only):**	**EMAIL:**	
ADDRESS:			
CITY:	**STATE: TEXAS**	**ZIP CODE:**	**COUNTY:**
PHONE: **Work:**	**Home:**		**Cell:**
JOB TITLE:			☐ **1st Shift** ☐ **2nd Shift** ☐ **3rd Shift**
DEPARTMENT:		**SUPERVISOR:**	
LIST ANY LOST TIME DUE TO INJURY:		**DATE REPORTED TO SUPERVISOR:**	
DATE AND TIME OF INJURY:			☐ **A.M.** ☐ **P.M.**
SPECIFIC LOCATION OF WHERE ACCIDENT OCCURRED:			
LIST ALL PART(S) OF BODY INJURED:			
EXPLAIN HOW AND WHY THIS INJURY OCCURRED (Provide as much detail as possible):			
WITNESS(ES) / NAME & PHONE #:			
DESCRIBE MEDICAL CARE RECEIVED:			
SIGNATURE OF INJURED EMPLOYEE:		**DATE:**	
SIGNED ON BEHALF OF INJURED EMPLOYEE: (in an emergency situation when Employee is unable to sign)		**DATE:**	
PRINTED NAME OF PERSON SIGNING ABOVE:			
WAS 911 CALLED?		☐ **YES** ☐ **NO**	
WAS INJURED EMPLOYEE TRANSPORTED BY EMS?		☐ **YES** ☐ **NO**	

THIS FORM DOES NOT CONSTITUTE ACCEPTANCE OF A WORKERS' COMPENSATION CLAIM.

TO REQUEST MEDICAL CARE UNDER ALAMO COLLEGES' SELF-FUNDED WORKERS' COMPENSATION PROGRAM or for QUESTIONS ABOUT THIS REPORT, PLEASE CALL ENTERPRISE RISK MANAGEMENT AT THE #s LISTED ABOVE. THE COMPLETED FORM MUST BE SENT BY FAX OR EMAIL TO RISK MANAGEMENT AS SOON AS POSSIBLE. THE INJURED EMPLOYEE MUST PROVIDE A COPY OF THIS REPORT TO THE DEPARTMENT SUPERVISOR. **Revised: 08/06/2019**

ALAMO COLLEGES

ENTERPRISE RISK MANAGEMENT

Email to: dst-ERM@alamo.edu
lrueda1@alamo.edu
mlegg2@alamo.edu

Phone: (210) 485- 0065; (210) 485- 0069 OR(210) 485- 0206

☐ DIST ☐ SAC ☐ SPC ☐ SWC ☐ PAC ☐ NVC ☐ NLC

SUPERVISOR'S REPORT / INJURY TO EMPLOYEE

Name of Injured Employee:	Banner ID:	Date/Time of Injury:
Department:	☐Male ☐Female	Date/Time Reported to Supervisor:
Nature of Injury:		Part of Body Injured:
Cause of Injury:		Location of Injury:
Job Activity Being Performed at Time of Injury:		Name and Phone # of Witness(es):

Was Employee Acting within the Course & Scope of Job Duties at the time of Injury? ☐Yes ☐No

Brief Description of Injury Event:

Describe Hazard Controls/Warning Signs in the Area:

Describe Unsafe Physical or Mechanical Condition, if any:

What did the employee "**Do**" or "**Fail to Do**" that contributed to the Injury?

List any Personal Protective Equipment (PPE) being used at the time of Injury?

Could this Injury have been prevented? ☐Yes ☐No If Yes, please explain:

What actions will be taken to prevent future similar Injuries?

Do you agree with the employee's description of the Injury or Information? ☐Yes ☐No If No, please explain:

Type of Injury:

- ☐ Slip/Fall – indoors same surface
- ☐ Slip/Fall – outdoors same surface
- ☐ Slip/Fall – indoors elevated surface
- ☐ Slip/Fall – outdoors elevated surface
- ☐ Struck by falling/flying object
- ☐ Struck against object
- ☐ Contact with temperature extremes
- ☐ MVA
- ☐ Contact with gas or chemical
- ☐ Contact with electrical current
- ☐ Contact with equipment
- ☐ Caught in/between
- ☐ Exposure disease
- ☐ Lifting, pushing or pulling
- ☐ Other

Cause of Injury:

- ☐ Inadequate guards or protection
- ☐ Defective equipment or materials
- ☐ Inadequate warning systems
- ☐ Fire and/or explosion
- ☐ Lack of housekeeping
- ☐ Hazardous atmospheric conditions
- ☐ Excessive noise
- ☐ Inadequate lighting
- ☐ Poor layout/planning/design
- ☐ Sharp/rough/unfinished surface
- ☐ Foreign substance in walkway
- ☐ Unexpected movement hazard
- ☐ Unauthorized operation
- ☐ Improper procedures
- ☐ Errors of others
- ☐ Errors of employee
- ☐ Horseplay
- ☐ Inattention
- ☐ Other

Was 911 Called? ☐Yes ☐No

Was injured employee transported by EMS? ☐Yes ☐No

Supervisor's Signature:	**Supervisor's Printed Name:**
Supervisor's Phone #:	Date:

TO REQUEST MEDICAL CARE UNDER ALAMO COLLEGES' SELF-FUNDED WORKERS' COMPENSATION PROGRAM or for QUESTIONS REGRADING THIS REPORT, PLEASE CALL ENTERPRISE RISK MANAGEMENT (ERM) AT THE #s LISTED ABOVE. THE COMPLETED FORM MUST BE PROVIDED TO ERM WITHIN 24 HRS. OF THE ACCIDENT. ALSO PROVIDE A COPY TO THE HEAD OF THE DEPARTMENT.

Safety Plan reviewed by District Environmental Health & Safety: Signature:
Date:

Safety Plan reviewed by VPCS: Signature: Katherine Doss
Date:

Safety Plan reviewed by VPAS: Signature: Elizabeth Tanner
Date: Elizabeth Tanner (Sep 30, 2020 07:41 CDT)

Safety Plan reviewed by Chairperson of Sciences & Kinesiology: Signature: Sara Wilkins
Date: Sara Wilkins (Sep 30, 2020 10:21 CDT)

Safety Plan reviewed by Director of Veterinary Technology: Signature: Laurie Pawelek
Date: Laurie Pawelek (Oct 2, 2020 10:52 CDT)

Safety Plan reviewed by Director of College Services: Signature: J L Mejia
Date:

Safety Plan reviewed by Coordinator of College Risk Management: Signature: Anthony Murph
Date: