TEXAS A&M UNIVERSITY CENTRAL TEXAS

CHEMICAL HYGIENE PLAN

August 26, 2016

Texas A&M University – Central Texas

Chemical Hygiene Plan

Submitted by: A&M Central Texas Laboratory Coordinator

Approval Document

Original signed and on file

Laboratory Coordinator Date

Original signed and on file

Dean, College of Arts and Sciences Date

Original signed and on file

Vice President for Finance and Administration Date

Original signed and on file

Provost / Vice President for Academic & Student Affairs Date

Original signed and on file

President Date

Change No.	Date of Change	Description of Change	Change Made by:
Initial	September 11, 2015	Initial document	Allyson Martinez

Contact Information

Emergencies

A&M-Central Texas University Police Department
Dial: (254) 501-5800 or 5800 from any campus phone

If immediate medical attention is required dial 911 from any campus phone

Non-emergencies

Safety and Risk Management Officer – Shawn Kelley
Dial: (254) 519-5771 or 5771 from any campus phone

Lab Coordinator – Allyson Martinez, Ph.D.
Dial: (254) 501-5843 or 5843 from any campus phone

Table of Contents

Appendices

Introduction

Texas A&M University-Central Texas strives to implement policies and protocols that will establish and maintain a safe working environment in all instructional and research laboratories. These policies and protocols will keep exposure to potential laboratory hazards at the lowest possible levels by ensuring that students, faculty, and staff observe the safety practices and guidelines outlined in this Chemical Hygiene Plan (CHP).

Responsibility

Although it is the responsibility of everyone using the laboratories to adhere to all of the safety policies and protocols, certain responsibilities lie with specific university positions as outlined below:

Laboratory supervisors (Lab Coordinator and Principal Investigators)

a. Ensure that all laboratory workers have received laboratory safety training.
b. Maintain records documenting all laboratory training of students, faculty, and staff.
c. Maintain up-to-date copies of the A&M-Central Texas CHP and Safety Data Sheets (SDS) in the laboratories.
d. Enforce the use of the procedures and protocols outlined in the A&M-Central Texas CHP.
e. Ensure all laboratory equipment is properly maintained and in good working order.
f. Make weekly inspections of chemical storage and eye wash station; document check on the equipment's card.
g. Make monthly inspections of laboratory, laboratory work areas, and safety equipment; e.g., the monthly inspected fire extinguisher and emergency shower; document checks on the equipment's card.
h. Submit and then track work order requests for repair. Follow-up on repairs each week.

Laboratory workers (Students, Work-study students, Teaching/Research Assistants)

a. Follow the safety procedures and protocols outlined in the A&M-Central Texas CHP.
b. Wear prescribed Personal Protective Equipment (PPE) and adhere to laboratory dress code (outlined in Personal Hygiene section of CHP).
c. Report any injuries, spills, or other incidents to laboratory supervisor immediately.
d. Request information/assistance when unsure about how to handle a hazardous chemical.

Safety & Risk Management Officer (SRMO)

a. Ensure that all laboratory workers have received laboratory safety training.
b. Once per semester, conduct an oversight inspection of laboratory inspection records, equipment check cards, and review work orders for timely submission and problem resolution..
c. Once per semester, conduct a quality control inspection of laboratory, laboratory work areas, and safety equipment.
d. Maintain a library of SDSs and other safety resources.

Chemical Hygiene Officer

a. Develop and revise the CHP.
b. Develop and revise Laboratory Safety Training for students, faculty, and staff.
c. Review the CHP annually

Heads of Academic and Administrative Units

a. Make budget arrangements for health and safety improvements.
b. Work with faculty to adapt and implement the CHP.

Noncompliance with Safety Protocols

The following steps will be taken in response to noncompliance to this Chemical Hygiene Plan:

Students

a. Any student in violation of safety dress code or not properly utilizing PPE will not be permitted in the laboratory until the condition is corrected, which may result in an *unexcused* absence.
b. Any student conducting unauthorized experimentation or who disregards safety protocols which puts themselves and/or others in danger will be subject to disciplinary actions in accordance with university policy.

Laboratory supervisors

a. Laboratory supervisors failing to enforce safety protocols will receive one email notification to take immediate steps to correct the problem and the SRMO will be notified.
b. If no action is taken, the laboratory supervisor will receive a written notification of the safety violation(s). Corrective action is required within 14 days.
c. If the problem continues, a notification of the safety violation(s) will be sent to the Department Chair and the Dean of the College.
d. Any violation that results in a high or unacceptable risk to students or others will be immediately reviewed by the SRMO, CHO, Department Chair, and Dean of the College, if necessary. Disciplinary action may include immediate suspension.

Laboratory Safety Training

All individuals who may be exposed to hazardous chemicals at A&M-Central Texas are required to undergo Laboratory Safety Training. The A&M-Central Texas CHO is responsible for ensuring that all students, faculty, and staff are properly trained in the use of hazardous chemicals and equipment in the laboratory BEFORE they are allowed to work in the laboratories. The CHO is responsible for the following training:

a. Content and location of the CHP Hazard Communication Plan, and SDS provided by the CHO.
b. Potential hazards and administering first aid when chemicals are involved.
c. Signs and symptoms of overexposure to chemicals and how to detect potentially harmful exposures.

d. Understanding the permissible exposure limits in the laboratories.
e. The proper location and use of safety equipment such as safety showers and eyewashes, first aid kits, fire extinguishers, chemical spill kits, fire alarms, emergency exits, and emergency phone numbers.
f. Laboratory-specific training for students, faculty, and staff that will be routinely working in the laboratories.

Standard Operating Procedures

Adhere to the following safety guidelines at all times when working in A&M-Central Texas laboratories.

a. Before working in the laboratory, be familiar with safety procedures including locations of the nearest exits and emergency shutoff valves (primary and secondary egresses).
b. Know the locations of emergency safety equipment in the laboratory (i.e. shower, eye wash, fire extinguishers, first aid kit, chemical spill kit, etc…).
c. Wear proper attire at all times as exposed skin is prone to splashes, burns, lacerations, etc. Anyone not wearing proper attire will be asked to leave the laboratory immediately and may not reenter until properly attired. Proper attire include the following:
    - Long pants or skirts covering legs (no shorts, capris, short skirts, etc…)
    - Long sleeved shirt and/or laboratory coat
    - Closed toe shoes capable of protecting the wearer from direct exposure by absorbing nuisance quantities of laboratory chemicals that may fall or splash on them (i.e. no sandals, flip-flops, high heels, or mesh-style shoes, etc…) what about the Nike mesh style or even those Toe style shoes? Athletic shoes and feet covers are now pushing the boundaries of what may be perceived as safe, but may not be.
    - Long hair must be tied back tightly and securely
    - No dangling jewelry, hats, or large hair accessories
    - Additional appropriate personal protective equipment (e.g., gloves, eye protection, splash shields, aprons) may be required for hazardous activities)
d. Appropriate PPE is to be worn at all times while in the laboratory, but it is NOT to be worn outside of the laboratory.
e. Bulky items such as backpacks, other bags, and coats are not to be brought to individual workstations. These items must be placed in lockers, cubbies, or coat room.
f. Chemical stock bottles are never to be brought to individual work stations. Workers are to dispense needed amounts into small containers and carefully bring these to the work station. Unused chemicals are never to be returned to chemical stock bottles.
g. When using chemicals, refer to the appropriate safety information, such as Safety Data Sheets (SDSs), Standard Operating Procedures (SOPs), and equipment operating instructions, and follow the recommended safe practices.
h. Mouth pipetting of any liquid in the laboratory is strictly prohibited.
i. Laboratory waste is to be properly disposed when finished with a laboratory session. Take care to place hazardous chemical wastes in their proper waste containers. If unsure how to dispose of waste, ask a laboratory supervisor. Do not assume it is safe to dispose of laboratory waste in the trash or sink.

j. When using Bunsen or Meker burners, be sure that the flame is properly adjusted. Seek assistance if unsure how to accomplish this. Never leave an open flame unattended.
k. When working with hazardous materials, be sure to properly use fume hoods and biological safety cabinets as required.
l. Be aware of what others are doing around you and any hazards that may exist between chemicals and procedures in adjacent work spaces.
m. Avoid touching face/mouth with hands or writing implements while working in the laboratory.
n. Do not force glass tubing into rubber stoppers. Lubricate fire polished tubing, use a glass tubing inserter, and protect hands with proper PPE when inserting tubing.
o. Dispense chemicals only into approved chemistry glassware.
p. Only use boro-silicate (PYREX, KIMAX, etc.) containers for heating solutions.
q. Laboratory bench and table tops are to be wiped clean of chemicals BEFORE and AFTER each session of use.
r. Unauthorized experiments are NOT permitted.
s. Do not work alone in the laboratory; always be sure that someone else is present in case of an emergency.

Personal Hygiene

To minimize exposure to hazardous chemicals, all workers should wash hands frequently, especially after handling chemicals, changing gloves, and before leaving the laboratory.

Personal Protective Equipment (PPE)

a. Protective eyewear is required for anyone (including visitors) in a laboratory where hazardous chemicals are being used. This includes safety glasses, safety goggles, and/or full face shield, which shall be determined based on the type and quantity of chemicals used. Personal prescription glasses and contact lenses are NOT considered protective eyewear and must be supplemented with the aforementioned PPE(s).
b. Protective clothing must be worn at all times when working with chemicals. Any exposed skin should be covered with long sleeves/pants and a laboratory coat. The laboratory coat must be laundered regularly and never worn outside of the laboratory. Loose fitting clothing must be secured at all times, especially when working with open flames or rotary equipment. Additional protective clothing (e.g. aprons, shoe covers) may be required when working with certain chemicals.
c. Gloves must be used when working with hazardous materials. The type of gloves required will depend on the nature of the hazardous substance in use (e.g. chemical resistant gloves should be worn for contact with corrosive or toxic substances and substances of unknown toxicity) (**Appendix E**).
d. Respiratory hazards can be controlled using ventilation or respiratory protection. When a potential inhalation hazard exists, the label or SDS will contain special warnings. Take appropriate precautions when handling these substances. Controlling inhalation exposures through engineering controls (ventilation) is always the preferred method; use hazardous chemicals inside of a fume hood or biological safety cabinet.

Emergency Procedures

Emergency assistance

a. All accidents involving students, faculty, staff or visitors are to be reported to the laboratory supervisor and University Police at ext. 5800.
b. An incident report form will be completed for all accidents and a copy will be kept on file.
c. A&M-Central Texas employees must report accidents to their supervisors and complete the Employers First Report of Injury or Illness form (DWC Form-001) (**Appendix A**).

Accidents

a. Minor accidents
    i. Administer appropriate first aid.
    ii. Notify CHO or PI, who will report to SRMO or other responders if necessary.
b. Major accidents
    i. Get individual(s) involved in the accident to a safe place.
    ii. Call campus police: 254-501-5800 or 5800 from any campus phone or 911 for emergency responders.
    iii. Provide first aid or other basic life support (CPR, rescue breathing, etc.).
    iv. Retrieve Automated External Defibrillator (AED).
    v. Notify CHO or PI, who will report to SRMO or other responders if necessary.

Chemical Spills:

a. Minor spills
    i. Clear individuals from immediate area.
    ii. Treat injured or contaminated individuals.
    iii. Skin contact: flush with water (e.g., using sink or safety shower, depending on extent and type of exposure) for at least 15 minutes (or as indicated by the SDS) and seek medical assistance.
    iv. Eye contact: flush with water (e.g., using eye wash station) for at least 15 minutes and seek medical assistance.
    v. Alert faculty/staff of nature of spill (type of chemical, approximate amount, location).
    vi. Consult SDS for clean-up precautions.
        1) Wear proper PPE.
        2) Absorb or cover spill with suitable materials, collect residue, and dispose using proper Chemical Waste Disposal protocol.
        3) A mercury spill kit must be used to contain mercury if there is a mercury spill/accident.
        4) Clean spill area with soap and water.
    vii. Notify CHO or PI, who will report to SRMO or other responders if necessary.
b. Major spills
    i. Clear individuals from laboratory and surrounding areas.

ii. Call campus police: 254-501-5800 or 5800 from any campus phone or 911 for emergency responders.
iii. Treat injured or contaminated individuals.
iv. Skin contact: flush with water (e.g., using sink or safety shower, depending on extent and type of exposure) for at least 15 minutes (or as indicated by the SDS) and seek medical assistance.
v. Eye contact: flush with water (e.g., using eye wash station) for at least 15 minutes and seek medical assistance.
vi. Turn off all ignition and heat sources.
vii. Close doors to affected areas.
viii. Notify CHO or PI, who will notify SRMO, University President, Provost, VP for Finance & Administration, Associate Provost, and/or Director of facilities, as necessary.

Emergency Safety Equipment

a. ***Safety Shower/Eye Wash stations*** are present in each of the laboratories and adjoining preparatory rooms. All persons working in a laboratory should be familiar with the operation of the shower and eye wash station. Safety showers will be tested by laboratory personnel once a month and eye wash stations will be tested once a week by laboratory personnel. In addition, safety showers will be tested for temperature and flow rate annually.
b. ***Fire Extinguishers*** are located in each of the laboratories and adjoining preparatory rooms. Fire extinguishers are ABC rated for fires. Do not use ABC fire extinguishers on fires involving combustible metals (e.g. magnesium, titanium, potassium and sodium), strong alkalis, strong oxidizers, and isocyanuric acids. Laboratory supervisors will be trained in fire extinguisher use. Fire extinguisher checks are conducted monthly and inspections/maintenance will be performed once a year by qualified individuals.

Safe Handling and Storage of Chemicals

Chemical Procurement

The Laboratory Coordinator shall establish guidelines for the procurement of all laboratory chemicals and shall be responsible for all hazardous chemicals purchased for A&M-Central Texas laboratories. Requests for chemicals must be submitted to the CHO for approval before purchasing. All employees involved in the receiving of chemicals shall be properly trained on the proper handling, storage, and disposal procedures. All received chemicals must have proper labels, MSDS/SDS, and proper packaging; packages arriving without the aforementioned materials and/or damaged or leaking packages/containers will not be accepted.

Chemical Inventory

a. Upon receipt of a chemical, the CHO will add it to the master chemical inventory list and date the chemical bottle.
b. Outdated chemicals or chemicals no longer of use or value are to be disposed of according to the chemical waste disposal protocol.
c. Chemical inventory is to be maintained and updated at least once each semester.

d. An updated copy of the chemical inventory will be kept in the laboratory and a copy will be sent to the SRMO.

Safety Data Sheets (SDSs)

a. Upon receipt of a chemical, the CHO will add the SDS to each of the SDS binders located in the laboratories, laboratory preparatory rooms, the Lab Coordinators office, the SRMOs office, and the Safety & Risk Management webpage.

Laboratory Equipment

Electrical Equipment

a. All electrical equipment must be UL listed and/or FM approved
b. All electrical equipment must be properly grounded
c. Extension cords will not be used on a permanent basis
d. All electrical equipment must be checked for:
    i. Good working condition
    ii. Cords are not damaged in any way

Autoclaves

a. All laboratory workers must use proper PPE, *including heat resistant gloves*, when operating this equipment.
b. All operators of this equipment must be instructed on proper use and follow all guidelines.
c. Use indicator tape on each load to verify sterilization.
d. Users must fill out the required information in the "Autoclave Log" binder.
e. Autoclave sterility tests using biological indicators must be conducted on a regular basis, and details must be recorded in the "Autoclave Log" binder.
f. Use caution when handling pressurized containers; superheated liquids may spurt.
g. Use red biohazard autoclave bags to autoclave. After material is cooled, place the autoclave bag and its contents inside a regular black trash bag before disposing of autoclave waste in the normal trash.
h. **Do not**:
    i. Place sharp/pointed items into an autoclave bag; use a rigid sharps container instead.
    ii. Overfill an autoclave; allow room for steam to effectively move around objects.
    iii. Mix contaminated and clean items together in same autoclave cycle.
    iv. Leave an operating autoclave unattended; someone must be in the general vicinity in case of malfunction.
    v. Lift a bag from the bottom to load or unload; always lift from top to avoid injury on potential sharp items.
    vi. Seal a liquid container with a cork, stopper, or fully tightened lid as it may result in an explosion.

Centrifuges

a. All laboratory workers must use proper PPE when operating this equipment.
b. All operators of this equipment must be instructed on proper use and follow all guidelines.
c. Whenever possible, use plastic centrifuge tubes to avoid breakage issues.
d. Inspect ALL centrifuge tubes for flaws before each use. Dispose of any damaged/unusable tubes.

Refrigerators

a. Laboratory refrigerators are to be used for laboratory materials only; no food or drink is to be stored in these refrigerators under any circumstances.
b. Flammable materials that require refrigeration *must not* be placed in standard refrigerators. Use only flammable-material refrigerators for these chemicals.
c. All materials must be properly dated and labelled.

Environmental Chambers

a. All laboratory workers must use proper PPE when operating this equipment.
b. All operators of this equipment must be instructed on proper use and follow all guidelines.

Incubators

a. All laboratory workers must use proper PPE, including heat resistant gloves, when operating this equipment.
b. All operators of this equipment must be instructed on proper use and follow all guidelines.

Drying Ovens

a. All laboratory workers must use proper PPE, including heat resistant gloves, when operating this equipment.
b. All operators of this equipment must be instructed on proper use and follow all guidelines.
c. Do not use ovens to dry any chemical that is volatile and may cause a health hazard or acute or chronic toxicity.
d. Organic compounds are not to be dried in these units.

Chemical Storage

a. Flammable chemicals must be stored in the labelled flammable chemical cabinet.
b. Corrosive chemicals must be stored in the labelled corrosive chemical cabinet.
c. Never store liquid chemicals above eye level.
d. Never stack chemicals of any kind on top of each other.
e. Chemicals are to be rotated so oldest chemicals are used first.
f. Segregate chemicals according to hazard class (**Chemical Hazards section**).
g. Waste should be collected in a designated fume hood or satellite accumulation area. Waste must be properly labelled and sealed according to Hazardous Waste Disposal Procedures (**Safe Disposal of Chemicals section**).
h. Label all containers with date of receipt.

Chemical Hazards

Flammable and Combustible

Flammable substances are those that readily catch fire and burn in air. Flammable liquids are those that have a flashpoint (lowest temperature at which the liquid produces enough vapor to ignite) below 100°F and a vapor pressure that does not exceed 40 pounds per square inch (psi) at 100°F. In addition to liquids flammable substances are also solids and gases. Examples of flammable gases are acetylene, ethylene oxide, and hydrogen. Flammable solids are those that are capable of producing fires as a result of friction or heat retained from production that, if ignited, produce serious transportation hazard. A combustible liquid is one which has a flash point at or above 100°F. Organic acids are combustible with many being liquids.

a. Explosives:
   Explosive gases and solids are also part of the flammable and combustible group. Light, mechanical shock, heat, and certain catalysts can act as initiators of explosive reactions. One example of an explosive mixture is a suspension of oxidizable particles, such as magnesium powder or zinc dust, in air. Explosives include nitrates, chlorates, perchlorates, and picrates.
b. Pyrophorics:
   Pyrophoric chemicals are those substances that react so rapidly with air and its moisture that the ensuing oxidation and/or hydrolysis lead to ignition. Ignition can be instantaneous, delayed or occur only if the material is finely divided or spread in a diffuse layer. Some examples are: finely divided metals, such as calcium, magnesium, and zirconium; metal or non-metal halides, such as diethylethoxyaluminum. Spontaneous (instantaneous) ignition or combustion occurs when a substance reaches its ignition temperature without the application of external heat. Substances capable of spontaneous combustion include alkali metals such as sodium and potassium, finely divided pyrophoric metals and phosphorus.
c. Water-reactive substances:
   Water sensitive compounds react exothermically and violently with water, particularly if it is present in limited quantities, since no significant cooling effect will occur. Some examples of water-reactive chemicals would include alkali and alkaline earth metals such as potassium and calcium; anhydrous metal halides, such as aluminum bromide and germanium chloride.
d. Peroxidizable substances:
   Peroxidizable substances slowly react under ambient conditions with atmospheric oxygen to initially form peroxides. Some peroxide formers are ethers, liquid paraffins, and olefins. Peroxides are extremely sensitive to shocks, sparks, or other forms of accidental ignition. Since these chemicals are packaged in an air atmosphere, peroxides can form even though the packages have not been opened. Unless inhibitor was added by the manufacturer, sealed containers should be discarded within one (1) year of receiving.
   See **Appendix D** for more information on Peroxide forming chemicals and peroxide testing.

Corrosives

Corrosives include strong acids, strong bases, dehydrating agents, and oxidizing agents. These chemicals erode the skin, damage the eyes, and cause severe bronchial irritation.

a. Strong acids:
   All concentrated acids can damage the skin and eyes. Nitric, chromic, and hydrofluoric acids are particularly damaging because of the types of chemical burns they inflict. When handling these chemicals, rubber gloves, rubber apron, and face shield must be used.
b. Strong bases:
   Common bases include: sodium hydroxide, potassium hydroxide, and ammonia. Metal hydroxides are extremely damaging to the eyes. When handling these chemicals, the appropriate gloves (A**ppendix E**), rubber apron, and face shield must be used.
c. Dehydrating agents:
   Strong dehydrating agents include concentrated sulfuric acid, sodium hydroxide, phosphorous pentoxide, and calcium oxide. These substances can cause severe burns on contact with skin because of their affinity for water.
d. Oxidizers:
   Oxidizers can be defined as any material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion of combustible materials.

Safe Disposal of Chemicals

a. Hazardous chemicals used in the A&M-Central Texas laboratories will be disposed of in a safe, approved manner consistent with all applicable laws and the A&M-Central Texas Campus Waste Management Program.
b. Laboratory staff should use the smallest quantity of hazardous substance that is practical to generate the least amount of hazardous waste.
c. Review experimental protocols with the goal of substituting non-hazardous or less hazardous reagents, using micro-scale procedures, and using materials that can be easily neutralized or detoxified.

Compressed Gas Procedures

a. Cylinders of compressed gas must be securely held (e.g., cylinder stand; individually strapped or chained to a wall or bench top).
b. When a cylinder is not in use, it must be capped.
c. Cylinders must always be stored in a secure, upright position.
d. Cylinders must only be transported using an appropriate dolly and must be chained to the dolly at all times during movement. Avoid moving cylinders that are uncapped and/or that have regulators attached.
e. Keep cylinders of flammable gases away from sources of heat or open flame.
f. Do not tamper with the safety features of gas cylinders.
g. Keep no more than one in-use and one spare cylinder of a gas in the laboratory at the same time.

Laboratory Design and Ventilation

a. Heating and cooling should be adequate for the comfort of workers and operation of equipment. Before modification of any building HVAC, the impact on laboratory or hood ventilation should be considered, as

well as how laboratory ventilation changes may affect the building HVAC. No change should be attempted without first consulting facilities maintenance and Safety and Risk Management.

b. A negative pressure differential should exist between the amount of air exhausted from the laboratory and the amount supplied to the laboratory to prevent uncontrolled chemical vapors from leaving the laboratory.
c. Local exhaust ventilation devices should be appropriate to the materials and operations in the laboratory.
d. The air in chemical laboratories should be continuously replaced so that the concentrations of odoriferous or toxic substances do not increase during the workday.
e. Laboratory air should not be recirculated, but should be exhausted directly outdoors.
f. Air pressure should be negative with respect to the rest of the building. Local capture equipment and systems should be designed only by an experienced engineer or industrial hygienist.
g. Ventilation systems should be inspected and maintained on a regular basis. There should be no areas where air remains static or areas that have unusually high airflow velocities.

Fume Hood Operation and Maintenance

The fume hood is one of the most important pieces of safety equipment in an A&M-Central Texas laboratory. The fume hood is intended for use during all procedures which pose a significant inhalation or fire hazard. A properly maintained and working fume hood provides a continuous wall of air flowing through the face of the fume hood.

a. Fume hood air flow:
    i. Air flow patterns in labs can be affected by many factors, such as traffic patterns, room make-up air, doorways, room size, hood location, work practices, objects inside the hood, baffle adjustments, and sash openings.
    ii. Ideally, there should never be any turbulence at the hood face which could spill contaminated air into the room.
    iii. All areas of the open hood face should have a velocity sufficient to draw room air and not spill contaminated air from the hood.
b. Fume hood classification guidelines:
    i. Fume hood velocities for all the A&M-Central Texas campus will be evaluated on an annual basis. The face velocity of all hoods shall fall between 80-100 fpm.
    ii. The hood should be marked for restricted use, indicating it should not be used for protection from highly toxic substances.
    iii. If the hood falls outside of its acceptable range of face velocity, it shall not be used, and it will be marked indicating it is shut down for repairs.

c. Fume hood work practices
    i. All work involving hazardous chemicals should be performed inside a ventilation hood.
    ii. Check the inspection sticker to make sure that the hood has passed inspection in the last year.
    iii. Before any work involving hazardous chemicals is performed, make sure that the fume hood is working.

iv. If the hood is equipped with a face velocity indicator, check the air flow readings at several sash heights, especially at the planned sash working height, to ensure that the hood is operating within its acceptable range
v. Fume hoods should be used with the sash open no more than comfortably necessary to conduct the work and never more than the indicated maximum sash height. The sash should be closed when a person is not actively working at the hood.
vi. Keep all equipment at least 6 inches inside the face of the hood to prevent disruptive air flow patterns.
vii. Maintain an air space under large equipment by placing it on blocks to allow air currents to freely pass under the equipment.
viii. Do not use the fume hood as a storage cabinet. Excessive storage can obstruct airflow and cause areas of low air velocity at the face opening.
ix. Do not put your face or head inside the hood.
x. Do not use perchloric acid in an A&M-Central Texas fume hood, as it is not designed for the use of this chemical.
xi. Minimize sources of cross drafts (open windows, doors, fans, heavy foot traffic, etc.) which may pull contaminated air from the hood.
xii. Ensure all fume hood users are aware of the safety procedures in case of emergency.

d. Fume hood inspections:
i. Fume hoods shall be inspected on an annual basis by a qualified person and shall be certified in writing.
ii. The CHO will maintain a copy of the fume hood certification and a label will be placed on the hood indicating the date inspected, the person/company performing the inspection and that the hood is in proper working order.
iii. In the event a fume hood fails an inspection, a warning sign shall be posted indicating the fume hood is out of service for repair and the hood shall not be operated for any reason until properly repaired.
iv. Any observed declined or failure of operation warrants an immediate shut-down of the hood and the CHO shall be notified to initiate repairs and post warning signs that the hood is inoperable.

Exposure Monitoring

It is the policy of A&M-Central Texas to investigate all suspected overexposures to chemicals in a prompt and timely fashion. In the event of overexposure, after the immediate event, the CHO shall document all chemicals and circumstances involved in the overexposure. A copy of the document shall be sent to the SRMO and the A&M System office of Environmental Health and Safety, where it shall be maintained and be accessible to the employees. The overexposure document should include:

1. Accidental breakage of hazardous material container
2. A skin rash or irritation because of contact with a chemical
3. Caustic splash to eyes, face, or body
4. Symptoms such as nausea, dizziness, and others

a. Monitoring will be necessary for substances regulated by federal or state agencies only if there is reason to believe that exposure levels for the substance routinely exceed the Permissible Exposure Limit (PEL) for the substance. If monitoring is performed and this initial monitoring shows no evidence of exposure, the monitoring may be discontinued.
b. If initial monitoring indicated an exposure above PEL, then steps shall be taken to reduce exposure and remedial actions recommended by SRMO shall be implemented to reduce exposure levels. A follow up by SRMO shall be conducted to monitor exposure levels within 60 days. All monitoring results and activities shall be available for employees upon request by contacting the CHO or SRMO.

Medical Consultation and Evaluation

An opportunity to receive medical consultation shall be provided at no cost or loss of pay to the employee and considered as a regular Worker's Compensation claim under the following circumstances:

a. When signs or symptoms develop associated with exposure to a hazardous material
b. When exposure to hazardous material is above the "Action Level" or PEL established for the chemical based on the SDS

Appendix A: Employer's First Report of Injury or Illness
DWC FORM-001

The **employer** is required to file an **Employer's First Report of Injury or Illness** [DWC FORM-001 Rev. 10/05] with the injured worker's insurance carrier, and the injured claimant or the claimant's representative within 8 days after the employee's absence from work or receipt of notice of occupational disease.

The **Employer's First Report of Injury or Illness** provides information on the claimant, employer, insurance carrier and medical practitioner necessary to begin the claims process. Details of the claimant's employment and circumstances surrounding the injury or illness are also requested.

Send the specified copies to your **Worker's Compensation Insurance Carrier** and the injured employee. ***Employers – Do not send this form to the Texas Department of Insurance, Division of Workers' Compensation, unless the Division specifically requests a direct filing.**

[Worker's Compensation Rule 120.2]

Employer's First Report of Injury or Illness [DWC FORM-001] can be found at:
http://www.tamuct.edu/departments/operations/bpp.php

Appendix B: Laboratory Incident Report

****To be completed with the Laboratory Supervisor in the case of injury, illness, hazardous substance exposure, fire, or spill****

Name of person involved in incident (If applicable): _____

☐ Employee ☐ Student ☐ Graduate Student ☐ Visitor

Laboratory Supervisor: _____

Class/Lab: _____

Time and date of incident: _____

Location of incident: _____

Details of incident: (nature of incident, e.g. illness, accident, injury. If injury occurred, indicated circumstances and who was involved. Indicate any substance (e.g. amount and kind of chemical or object involved))

What action was taken: (what was done to protect individuals or clean up substance? Also indicate if emergency personnel were contacted and if transport to the hospital occurred.)

Investigated by:
_____ (Print Name)
_____ (Signature)
_____ (Date)

Appendix C: Personnel and Room Locations

1. Safety Personnel

List the names of key safety personnel. In addition to indicating the individual in charge of the laboratory (i.e. the P.I. or lab manager) and the Laboratory Chemical Hygiene Officer the names of key staff such as building manager or other important individuals should be included.

Name	Position	Phone
A&M-Central Texas PD Dispatch	Emergency Responders	254-501-5800
Emergency	Emergency Responders	911
Allyson Martínez, Ph.D.	Laboratory Coordinator	254-501-5843
Allyson Martínez, Ph.D.	University Chemical Hygiene Officer	254-501-5843
Shawn Kelley	Safety & Risk Management Officer	254-519-5771

2. Laboratory Room Locations

List all rooms in which use of hazardous chemicals will occur:

Building	Rooms	Room Assigned	Shared Facility
Warrior Hall	407, 409, 410, 410a, 412, 413		

Appendix D: Peroxide Forming Chemicals (not an exhaustive list)

Class I: Unsaturated materials, especially those of low molecular weight may polymerize violently due to peroxide initiation. *Discard or test for peroxides after 6 months (liquids) or 12 months (gases).*

- Acrylic acid
- Acrylonitrile
- 1,3-butadiene (chloroprene)
- Chlorotrifluoroethylene
- 1,1-dichloroethene
- Methyl methacrylate
- Styrene
- Tetrafluoroethylene
- Vinyl acetate
- Vinyl chloride
- Vinyl pyridine
- Vinylidene chloride

Class II: The following chemicals are a peroxide hazard upon concentration (distillation/evaporation). A test for peroxides should be performed if concentration is intended or suspected. *Discard or test for peroxides 6 months after container is opened.*

- Acetal
- Cumeme
- Cyclohexene
- Cyclooctene
- Cyclopentene
- Diacetylene
- Dicyclopentadiene
- Diethylene glycol dimethyl ether (diglyme)
- Diethyl ether
- Dioxane (p-dioxane)
- Ethylene glycol dimethyl ether (glyme)
- Furan
- Methyl acetylene
- Methyl cyclopentane
- Methyl-I-butyl ketone
- Tetrahydrofuran
- Tetrahydronaphthalene
- Vinyl ether

Class III: Peroxides derived from the following compounds may explode without concentration. *Discard 3 months after opening container.*

- Divinyl ether
- Divinyl acetylene
- Diisopropyl ether
- 1,1-dichloroethene
- Potassium metal
- Potassium amide
- Sodium amide (sodamide)

Peroxide Detection Tests

**Do not test Class III peroxidizables suspected or known to contain peroxides. Contact your Chemical Hygiene Officer **

1. Peroxide Testing Strips – available commercially, turn color in the presence of peroxides
2. Chemical Method I
    a. Add 1-3 ml of unknown liquid to equal volume of acetic acid

   b. Add a few drops of 5% aqueous potassium iodide
   c. Shake.
   d. Yellow – brown color indicates presence of peroxides
3. Chemical Method II
   a. Add 1ml of fresh 10% potassium iodide to 10 ml of unknown liquid (organic) in 25ml glass cylinder
   b. Add a few drops of 5% aqueous potassium iodide
   c. Yellow color indicates presence of peroxides
4. Chemical Method III
   a. Add 0.5ml of unknown liquid to a mixture of: 1ml 10% aqueous potassium iodide and 0.5ml of dilute hydrochloric acid (to which has just been added a few drops of starch solution)
   b. Blue – blue-black color within 1 minute indicates presence of peroxides

** NONE of these tests should be applied to materials that may be contaminated with inorganic peroxides (e.g. metallic potassium) **

Appendix E: Chemical Glove Use Chart

(Note: This chart is for general use only. For high hazard or specific chemicals, consult the SDS and a reliable glove selection guide to select glove materials and types specific to the hazards involved.)

Type of Glove	Use Against	Disadvantages	Allergens	Cost
Natural rubber latex	•Biological and water based materials •Bases, alcohols	•Poor against lipids	•Latex allergies	Low
Polyvinyl chloride (PVC)	•Strong acids, bases •Lipids •Salts •Alcohols •Other water solutions	•Poor against organic solvents	•N/A	Low
Nitrile	•Oils, greases •Aliphatics •Xylene •Perchloroethane	•Poor against benzene, methyl chloride, trichloroethylene, many ketones	•N/A	Low
Neoprene	•Oxidizing acids •Anilines •Phenol •Glycol ethers	•N/A	•N/A	Medium
Butyl rubber	•Ketones, esters	•Poor against gasoline and aliphatic, aromatic, and halogenated hydrocarbons	•N/A	High
Polyvinyl Alcohol (PVA)	•Aliphatics, aromatics •Chlorinated solvents •Ketones (except acetone) •Esters, ethers	•Water sensitive •Poor against light alcohols	•N/A	High
Viton	•Aromatics •Chlorinated solvents •Aliphatics •Alcohols	•Poor against some ketones, esters, amines	•N/A	V. High
Norfoil	•Most hazardous chemicals	•Poor fit, punctures easily •Poor grip, stiff	•N/A	High
Stainless steel/Kevlar/Leather	•Cut resistant		•N/A	High

Appendix F: Chemical Spill Protocols

Acid Spills (hydrochloric or sulfuric acid):

1. Neutralize spill with sodium bicarbonate/baking soda or neutralizing spill kit
    a. If sodium bicarbonate/baking soda is used: wait until bubbling/fizzing has stopped
    b. If neutralizing spill kit is used, no bubbling will be observed since the kits are buffered. Follow directions and be careful not to over-neutralize
2. Test pH of the spill with pH paper after neutralization reaction has stopped
3. Once the pH is between 6 and 9, the material can be transferred to an appropriate secondary container for disposal
4. Wipe all surfaces with a sponge and wash all of the residual material down the sink

Base Spills (sodium or potassium hydroxide)

1. Neutralize spill with **DILUTE** acid such as vinegar, 3M HCl, or citric acid
    a. If dilute acid is used: wait until bubbling/fizzing has stopped
    b. If neutralizing spill kit is used, no bubbling will be observed since the kits are buffered. Follow directions and be careful not to over-neutralize
2. Test pH of the spill with pH paper after neutralization reaction has stopped
3. Once the pH is between 6 and 9, the material can be transferred to an appropriate secondary container for disposal
4. Wipe all surfaces with a sponge and was all of the residual material down the sink

Organic Spills (acetone, benzene, ethylene glycol, formaldehyde, methylene chloride, perchloroethylene, toluene, xylene, 1,3-butadiene)

1. Use an absorbent medium such as sand or vermiculite to absorb spill and prevent runoff
2. Transfer spilled material into an appropriate secondary container
3. Mark the container with the “Hazardous Waste” label and contact the CHO

Solid Waste

1. Sweep up and solid material and transfer directly to a secondary container after the spill occurs
2. Mark the container with the “Hazardous Waste” label and contact the CHO