Chemical Hygiene Plan

For

Mt. San Antonio College

February 2022

Environmental Safety/Emergency Services Manager
Sayeed Wadud – Safety and Risk Management
1100 N Grand Ave, Walnut CA 91789

(909) 274-5567

Table of Contents

Introduction

This Chemical Hygiene Plan is designed to clearly establish the policies, protocols, procedures, and best management practices, to protect all personnel using chemicals in the teaching or research laboratories at the Mt. San Antonio College (MT. SAC). Individual/s dealing with chemicals at teaching or research laboratories must be familiar with Chemical Hygiene Plan and it is their responsibility to ensure that these procedures are followed. A written version of this document is available on the MT. SAC website (www.mtsac.edu) for all individual who use chemicals at their work areas.

Purpose of this Chemical Hygiene Plan is to minimize exposures is needed and will be a regular, continuing effort, not merely a standby or short-term activity. The Plan's recommendations will be followed in academic teaching laboratories, as well as by full-time laboratory workers.

Workers exposed to hazardous substances are covered under the Hazard Communication standard. The Hazard Communication standard is intended to ensure employees are provided with Safety Data Sheets (SDS), along with training and information regarding the proper use of the SDS, and how to protect yourself when handling hazardous materials. Hazard Communication is broad based and applies to any type of operation that somehow uses hazardous substances.

Since laboratories handle various hazardous chemicals in different formats, the primary goal of this plan is to meet the requirements of the "Occupational Exposure to Hazardous Chemicals in Laboratories" standard to ensure appropriate safeguards are available to protect the health and welfare of laboratory workers. California Code of Regulations, Title 8, Section 5191; California Code of Regulations, Title 8, Sections 5139, 5154.1, 5155 & 5194.

This standard will work in conjunction with Hazard Communication for all California employers engaged in the laboratory use of hazardous chemicals. The regulation shall apply only to those chemicals, which meet the definition of laboratory use (see Appendix A). Chemicals or hazardous substances, which do not meet the definition of laboratory use even if they are used in a laboratory, will be regulated under the Hazard Communication standard.

Area Affected:

This Chemical Hygiene Plans is applicable to all personnel of MT. SAC working in the laboratories.

Definitions:

- **Acutely Toxic Chemical:** A chemical capable of causing a harmful effect after a single exposure.
- **Action Level:** A concentration for a specific substance, calculated as an eight-hour time-weighted average, which initiates certain activities such as exposure monitoring and medical surveillance.
- **Biohazardous waste:** Waste contaminated with potentially infectious agents or other potential infectious materials that possesses a threat to public health or the environment.
- **California Division of Occupational Safety and Health (Cal/OSHA)**: Regulatory agency charged with setting and enforcing standards, providing outreach and issuing permits.
- **Carcinogen:** Any substance that can cause or producing cancer.
- **Environmental Safety/Emergency Services Manager**: A designated employee who is qualified by training or experience to provide technical guidance in the development and implementation of the Chemical Hygiene Plan.
- **Chemical Hygiene Plan (CHP):** A written program that describes chemical handling procedures, laboratory equipment, personal protective equipment, safety rules and work practices that can protect employees from the health hazards presented by hazardous chemicals used in the laboratory.
- **Combustible Liquid:** Any liquid having a flash point at or above 100 degrees F, but below 200 degrees F, except any mixture having components with flash points of 200 degrees F, or higher, the total volume of which make up 99% or more of the total volume of the mixture.
- **Compressed Gas**: A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 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; or a liquid having a vapor pressure exceeding 40 psi at 100 degrees F.
- **Corrosive Chemical:** A chemical that causes destruction of living tissue by chemical action at the site of contact.
- **Chronic Toxic:** Materials that cause health effects long after exposures, often from repeated or long-time exposures. These effects may include organ damage, decreased lung function, kidney failure or cancer.
- **Designated Area:** An area that may be used for work with carcinogens, reproductive toxins or substances that have a high degree of acute toxicity. A designated area may be the entire laboratory, an area of a laboratory or a device such as a laboratory fume hood.
- **Emergency:** An occurrence such as, but not limited to, equipment failure, rupture of containers or failure of control equipment which results in an uncontrolled release of a hazardous chemical into the workplace.
- **Environmental Health and Safety office (EH&S):** is a collection of processes, rules, standards, laws, and regulations that aim to protect the environment, company, employees, organization, and individual harm.

- **Engineering Controls:** Strategies designed to protect workers from hazardous conditions by placing a barrier between the worker and the hazard or by removing a hazardous substance through air ventilation.
- **Environmental Protection Agency (EPA):** A federal government agency that protects human health and environment.
- **Explosive:** A chemical that causes a sudden almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.
- **Department of Transportation (DOT):** The Department of Transportation is responsible for planning and coordinating federal transportation projects. It also sets safety regulations for all major modes of transportation.
- **Flammable:** DOT hazard classification; usually pertaining to liquids with flash point of 140° F or less. Flammable. A chemical that falls into one of the following categories:
    - **"Aerosol, flammable**" means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;
    - "**Gas, flammable"** means: 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 greater than 12 percent by volume, regardless of the lower explosive limit.
    - "**Liquid, flammable**" means any liquid having a flashpoint below 100° F (37.8° C), except any mixture having components with flashpoints of 100° F (37.8° C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.
    - "**Solid, flammable**" means a solid, other than a blasting agent or explosive as defined in 29 CFR 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.
- **Flashpoin**t: The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested.
- **Fume Hood:** A laboratory device enclosed on 5 sides with a movable sash or fixed partial enclosure on the remaining side; constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air contaminants into the laboratory; and allow chemical manipulations to be conducted in the enclosure without insertion of any portion of the laboratory worker's body other than hands and arms.
- **Globally Harmonized System (GHS): The** classification and labelling of chemicals. GHS defines and classifies the hazards of chemical products and communicates health and safety information on labels and safety data sheets.

- **Hazardous Materials:** Any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors.
- **Hazardous Waste**: A waste with properties that make it potentially dangerous or harmful to human health or the environment. Can be in the form of liquid, solid or contained gases. Highly regulated and must be collected and handled as per strict campus guidelines.
- **Laboratory:** An area in a workplace equipped for scientific experiments, research, or teaching, or for the manufacture of drugs or chemicals
- **Laboratory Personnel:** Laboratory Personnel are individuals who work in the laboratory including, research scientists, post-doctoral fellows, technicians, undergraduate and graduate students, visiting scientists, laboratory volunteers, support personnel, and glassware washers.
- Laboratory Use of Hazardous Chemicals – Handling or use of such chemicals in which all of the following conditions are met:
  - Chemical manipulations are carried out on a "laboratory scale."
  - Multiple chemical procedures or chemicals are used.
  - The procedures involved are not part of a production process, nor in any way simulate a production process.
  - "Protective laboratory practices and equipment" are available and in common use industry–wide to minimize the potential for employee exposure to hazardous chemicals.
- **Medical Consultation** – A consultation which takes place between laboratory personnel and a licensed physician for purposes of determining what medical examinations or procedures, if any, are appropriate in cases where a significant exposure to a hazardous chemical may have taken place.
- **Oxidizer** – A chemical other than a blasting agent or explosive, that igniters or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.
- **Permissible Exposure Limit (PEL)** – The legal limit set by OSHA for work-place exposures.
- **Peroxide Compounds** – Chemicals that tend to absorb and react with oxygen from the air to form unstable peroxides which can explode with impact, heat, or friction.
- **Physical Hazard** – A chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, reactive or water-reactive.
- **Protective Laboratory Practices and Equipment** – Those laboratory procedures, practices and equipment accepted by laboratory health and safety experts as effective, or that can be shown to be effective, in minimizing the potential for employee exposure to hazardous chemicals.
- **Reactive Chemical** – A chemical that will vigorously polymerize, decompose, condense or become self-reactive due to shock, pressure, or temperature. Included in this definition are explosive materials, organic peroxides, pressure generating materials and water reactive materials.

- **Reproductive Toxins** – Chemicals which affect the reproductive capabilities including those that result in chromosomal damage (mutations) and those which affect the developing fetus (teratogens).
- **Select Carcinogens** – Substances strongly implicated as a potential cause of cancer in humans. A select carcinogen typically meets the following specific criteria:
  - It is regulated by Cal OSHA as a carcinogen.
  - It is listed under the category "known to be carcinogens" in the Annual Report on Carcinogens published by the National Toxicology Program (NTP).
  - It is listed under Group 1 by the International Agency for Research on Cancer Monographs (IARM).
  - It is listed in either Group 2A of 2B by IARC or under the category "reasonably anticipated to be carcinogens" by NTP and causes statistically significant tumor incidence in experimental animals.

- **Standard Operating Procedures (SOPs**) – Written protocols that describe how to perform a laboratory operation and contain relevant safety and health information.

- **TLV (Threshold Limit Value**) – The airborne concentration of material beyond which an individual should not be exposed without appropriate personal protective equipment. The TLV is set by the American Conference of Government and Industrial Hygienists (ACGIH).

- **Water Reactive** – A substance that undergoes a chemical reaction when wet with water.

Policy

MT. SAC is committed to providing a safe and healthful workplace for all laboratory occupants. To fulfill its obligation, MT. SAC will incorporate a formal Chemical Hygiene Plan as part of overall Injury & Illness Prevention. MT. SAC's Board Policy on Safety and the Management pledge to support this plan, to assure that it remains a viable method of protecting all laboratory occupants.

MT. SAC Administrators, Supervisors, and Managers will use all disciplinary procedures available to them to ensure that employees follow established safety policies and procedures. Performance evaluations, verbal counseling, written warnings, and other forms of disciplinary action are available.

The Chemical Hygiene Plan has been designed with major emphasis on the health and safety of all MT. SAC laboratory occupants, with the following considerations:

- The Plan is designed to protect laboratory occupants from the health hazards associated with the hazardous chemicals in each laboratory.
- The Plan is designed to keep exposures below the Permissible Exposure Limits and/or Action Levels as identified in Title 8, Section 5155.
- The Plan remains viable and effective.
- The Plan promotes health and safety, while striving to meet the educational goals of the MTSAC, departments, and instructors.
- The Plan enables MT. SAC to meet compliance with state, federal, and local regulations as regards to hazardous substances.

All MT. SAC administrators, managers, employees, and laboratory occupants will be required to be trained on Chemical Safety and adhere to the policies and procedures set forth under this Plan. The MT. SAC encourages all personnel affected by this Plan to provide constructive criticism to ensure the Plan remains viable and effective, while meeting its intended goals.

Plan availability

The Chemical Hygiene Plan will be readily available to all MT. SAC laboratory employees covered under this Plan and identified in the introduction. The Plan will also be readily available when requested by authorized employee representatives and the California Division of Occupational Safety and Health. Copies of this Plan will be distributed to all employees working in the Physical Science and Biological Science Labs, and distribution will be coordinated by the Environmental

Safety/Emergency Services Manager. Copies of the plan will be kept in all the chemical stock rooms Physical science and Biological Science. Division Office, Facilities Planning and Management, Human Resources, and the office of the Vice President of Instruction.

Plan review

The Environmental Safety/Emergency Services Manager will review the Plan within 12 months of implementation, then annually thereafter and proposed changes will be submitted to the *Safety Committee for review*. The Plan review is to determine whether all aspects of the Plan are still viable and effective. *Safety Committee minutes will be used to document the Plan review and changes.*

Chemical Hygiene Responsible Personnel

The Environmental Safety/Emergency Services Manager is responsible for implementation of the Plan as described in this document. MT. SAC hereby assigns:

Name: Sayeed Wadud **Title:** Manager Environmental Safety/Emergency Services to the position of Environmental Safety/Emergency Services Manager

MT. SAC offers its full support to the Environmental Safety/Emergency Services Manager and pledges to provide Chemical Hygiene personnel with the time and resources necessary to fulfill their responsibilities. The Environmental Safety/Emergency Services Manager is an employee who is designated by the employer, and who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan. This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employers' organizational structure.

Plan contents/regulatory requirements

Sayeed Wadud MT. SAC has developed a written Chemical Hygiene Plan to comply with the regulation and as a tool to protect employees from health hazards associated with hazardous chemicals in the laboratory. MT. SAC's plan is designed to keep exposures below permissible limits and to protect employees from health hazards associated with hazardous chemicals in the laboratories.

- Standard operating procedures relevant to safety & health when working with chemicals in the lab are located in Section I and have been developed to ensure a safe workplace.

- Measures to be taken to ensure that emergency equipment and fume hoods function properly and perform adequately can be found in Section I.

- Criteria to be used to determine and implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of personal protective equipment and hygiene practices can be found in Section II.

- Requirements for prior approval from the employer or designee before implementation of particular laboratory operation can be found in Section III. This section covers control measures for extremely hazardous substances.

- To ensure employees have an adequate opportunity to receive medical attention, including medical consultation and/or medical examinations, MT. SAC has implemented procedures to allow employees to seek medical consultations & medical examinations. These procedures can be found in Section V.

- MT. SAC will make available an information and training program to all laboratory employees. The goal of this program is to ensure that all laboratory personnel are adequately informed about laboratory work, appraisal of the hazards of chemicals present in the laboratory, and that they are knowledgeable in what to do if an accident occurs. Specific details regarding the contents of the information and training program can be found in Section VI.

Recordkeeping

Recordkeeping will include the following:

1. Records of changes to the Chemical Hygiene Plan in the form of Safety Committee Minutes and the actual written Chemical Hygiene Plan
2. Records of health and safety training for employees working in the laboratory. These records will be kept in the Environmental Safety/Emergency Services Manager s office
3. Records of the annual general laboratory safety inspections
4. Records of the monthly testing of the emergency eyewashes and showers
5. Records of the annual fume hood surveys (additional surveys may be conducted on a more frequent basis as directed by the Environmental Safety/Emergency Services Manager)

These records will be maintained for at least 5 years by the Chemical Hygiene Office and a copy sent to Administration.

Inspections

Mt. San Antonio College has implemented the following inspections based on regulatory requirements. Below is a list of the required inspections and frequency to be performed by the Laboratory Technician and Facility Planning and Management department.

1. Emergency Eyewash and Deluge Shower testing/activation will be performed monthly to ensure proper operation. CCR Title 8; Section 5162 (e) (laboratory technician).
2. Fume Hood ventilation rate surveys will be conducted at least annually. CCR Title 8; Section 5143 (a) (5) (Maintenance department).
3. General laboratory safety/housekeeping inspections will be performed annually (EHS).
4. Inspections of personal protective equipment will be conducted on a regular basis. (Laboratory technician)

Section I
Standard Operating Procedures
For Working with Laboratory Chemicals

Storage and use of hazardous substances are necessary for the continued operation of any school laboratory. Hazardous materials are generally necessary for their educational value in science labs. Therefore, users of these hazardous chemicals must be trained on how to handle hazardous chemicals, must be familiar with safe handling, storage and disposal to minimize/eliminate personal injurie.

Injury or illness to employees, students, or visitors, damage to MT. SAC owned or leased property, and damage to the property of others, are all examples of the loss potential resulting from the misuse of hazardous substances. Proper storage, handling, use procedures, and techniques will decrease the probability of loss both in terms of frequency and severity. With this in mind, the following general principles for safe and healthy lab work are given:

- It is prudent to minimize all chemical exposures. Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted, rather than specific guidelines for particular chemicals. Skin contact with chemicals should be avoided as a cardinal rule.

- Avoid underestimation of risk. Even for substances of no known significant hazard, exposure should be minimized. For work with substances that present special hazards, special precautions should be taken. One should assume that any mixture will be more toxic than its most toxic component, and that all substances of unknown toxicity are toxic.

- All containers supplied by manufacturers or suppliers, and holding hazardous materials, should have labeling that provides at least the chemical identity, a list of hazardous ingredients, hazard warnings, and the name and address of the manufacturer or supplier. Portable containers, into which hazardous substances have been transferred to from properly labeled, larger containers, must have labels that provide at least the chemical identity and hazard warnings. Employees should follow guidelines provided by the manufacturer or supplier for storage, handling, and use. Employees should not use chemical substances from unlabeled or improperly labeled containers.

- A Safety Data Sheet (SDS) is a document prepared by the manufacturer or supplier of hazardous substances. This document contains pertinent information regarding health hazards and safety precautions necessary for use with a given substance. The SDS contains information on storage patterns, storage conditions, incompatibles, personal protective equipment, and other precautions necessary for safe use of the substance. Employees should be familiar with the contents of the SDS for the hazardous materials that they work with and where the SDS is kept. Employees should be encouraged to review the SDS before using a hazardous material. A SDS binder will be stored in each lab

specific to the chemicals that are handled and stored in that lab. The SDS binder will be reviewed annually and updates made accordingly.

- Although container labels may have safety precaution information, the SDS is generally more comprehensive in the scope and amount of information provided. Therefore, the SDS should be considered an extremely important tool for obtaining information regarding safe storage, handling, and use procedures.

- The SDS provides information on routes of entry (or how one may be exposed to a hazardous material), personal protective equipment, and other methods of protection from over exposure. Once the user of a hazardous material knows the health hazards associated with the use of the material and how exposures occur, the next step is to take appropriate action to prevent over exposure and the resulting health effect.

- By knowing the route of entry (such as through inhalation, skin contact, or ingestion), the users of hazardous materials can protect themselves by following the manufacturer's recommended procedures, using appropriate personal protective equipment, practicing good personal hygiene, and having other protective devices available as specified by the manufacturer.

- Ventilation is an engineering control that is an important consideration in controlling exposures to hazardous materials. The ventilation requirements will be detailed on the SDS, and may also be listed on the container label. All employees should be instructed to adhere to manufacturer's guidelines regarding the use of hazardous materials and the ventilation required for safe use. If engineering controls are not feasible, or do not reduce exposure to an appropriate level, then exposures should be reduced by limiting the amount of time of exposure (both frequency and duration), or by requiring the use of personal protective equipment.

- Personal protective equipment includes such items as respiratory protective equipment (if needed), eye goggles, face shields, gloves, aprons, and cover shoes. The SDS will list all equipment that should be available when using a given hazardous substance. Personnel should not be using hazardous materials unless the appropriate personal protective equipment has been provided, and they have been trained in the proper use of such equipment.

- Other protective measures that can reduce the loss potential include the use or installations of appropriate fire extinguishers, eyewash stations, deluge or quick drench showers, spill kits, and proper storage facilities.

- Employees will not be required to work with or use hazardous substances for prolonged periods or have repeated exposures, unless proper precautions have been taken to keep exposures to safe levels.

- Provide adequate ventilation. The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of hoods and other ventilation devices.

- Observe the exposure limits and Threshold Limit Values (TLV). The exposure limits of Cal-OSHA and the TLV of the American Conference of Governmental Industrial Hygienists (ACGIH), should not be exceeded.

- Disposal of hazardous waste is a major concern for all laboratories. The goal of the Plan is to ensure minimal harm to laboratory occupants, other site occupants, other organisms, and the environment while complying with governmental regulations in a cost efficient manner. The section on each individual SDS that references disposal should be followed. All hazardous waste is to be placed in clearly labeled containers with the date accumulation began. The containers are to be kept sealed.

Section II
Criteria to Use for Implementation
Of Measures to Reduce Exposures

Engineering controls, the use of personal protective equipment, hygiene practices and housekeeping are control measures that MT. SAC has implemented to reduce employee exposure to laboratory chemicals.

Engineering Controls

Engineering controls consist of controls designed to physically separate, segregate, or remove exposures from laboratory personnel. Engineering controls used in the Natural Science and Art Departments consist of items such as the following:

- General ventilation
- Local ventilation
  - Fume hoods
- Segregation
  - Segregating the chemicals from the user through the implementation of fume hoods and glove boxes.
  - Segregation of incompatible chemicals in a well-identified area with local exhaust ventilation.

Ventilation

Ventilation is provided for two basic considerations:

1) The comfort of the building occupants;
2) Health and safety considerations for those working in laboratories, preparation, and chemical storage areas. Often the two areas conflict with one another when viewing ventilation from a standpoint of efficiency. The health and safety considerations should always be the primary concern. Comfort ventilation provides for tempered air and odor elimination. Health and safety ventilation provides for the dilution and removal of potential harmful air contaminants.

Local ventilation is used for the removal of air contaminants from the workplace atmosphere. Local pickups exhausting through flexible hoses may be used effectively to remove fumes from well-defined sources of fumes, but their effectiveness may be limited due to the following:

- Air movement toward the nozzle is reduced to less than 10% of the original value once the nozzle is moved a distance equal to its diameter from the source.

- The exhausting ductwork poses problems if one or more exhaust fans fail.

Unless specific requirements dictate a specific chemical or biological hood, a general purpose hood may be used. The chosen hoods should offer the following features:

- Positive velocity sensors with visual and audible alarms.

- Corrosion resistance.

- Easily decontaminated.

- The ability to safely handle flammable materials.

Each hood installation should be configured by a ventilation engineer, especially with regards to the blower motor requirements.

Hoods should be selected with movable sashes, preferably a vertical sliding type. Laminated safety glass is probably considered the best material for sashes.

Fume hoods will be evaluated before initial use and at least annually to ensure an average face velocity of at least 100 linear feet per minute (lfm) with a minimum of 70 lfm at any point, and with the absence of excessive turbulence.

Fume hoods are not intended primarily for the storage of chemicals; therefore, material storage in hoods must be kept to a minimum. Stored chemicals should never block vents or alter airflow patterns.

Hood ventilation shall remain in operation during all times hoods are in use, and for a sufficient time thereafter, to ensure all airborne contaminants have been removed. When mechanical ventilation is not in operation, hazardous substances in the hood must be covered.

Evaluation of Fume Hood Performance/Inspections

All fume hoods will be evaluated for performance when they are installed, on an annual basis and any time there is a change in any aspect of the ventilation system (e.g., change in total volume of supply air, changes in locations of supply air ports, or the addition of other auxiliary local ventilation devices). *Additional surveys may be conducted at the beginning of each semester at the direction of the Environmental Safety and Emergency manager.* Performance evaluations should include comparison of evaluation results to design specifications for uniform airflow across the hood face and for the total exhaust air volume.

Facility management team will be responsible for conducting the inspections of the fume hoods and the surveys to ensure the units are operating at the adequate ventilation rate. If deficiencies are identified, Facilities Department will take appropriate corrective action to address the issue. Items specific to the operation of the Fume Hoods can be found in the Laboratory Safety Checklist located in Appendix D and the Fume Hood Survey Sheet can be found in Appendix F. These checklists will be kept on file for at least 5 years for recordkeeping purposes. We will also keep the copies of the inspections.

Ventilation Maintenance

Local and general ventilation systems supplying laboratories will be on a preventive maintenance plan to ensure continued proper operation. *The Director of Facilities Planning and Management* will review design specification and manufacturer's recommendations, to determine an appropriate frequency for preventive or routine maintenance. At a minimum, the preventive maintenance should include:

- Inspection of air intakes and exhausts.
- Inspection of belts or other moving components.
- Inspection of all motors and fans.
- Lubrication of all appropriate items such as bearings, gears, etc.
- Cleaning and/or replacement of filters.

Personal Protective Apparel and Equipment

In addition to safety and emergency equipment, certain personal protective equipment is available for all laboratory personnel. *All laboratory personnel who may use protective equipment are trained in its proper use and the equipment will be inspected regularly by the Laboratory Technician*. EHS will be providing the training. Basic personal protective equipment should include:

- **Eye Protection.** Eye protection is worn any time chemicals are used. Contact lenses should not be worn when working with chemicals as the lenses can concentrate gases and vapors and can make first aid difficult in the event of chemical splashes. Eye protection can include:
  - **Safety Glasses.** Safety glasses should comply with the American National Safety Institute (ANSI) standard Z87.1. Safety glasses, especially those fitted with side shields, can offer good protection from flying particles, but not from splashes.

Therefore, if significant splash hazards exist, other protection should be employed.

- **Goggles.** Splash-proof goggles should be used when protection from splashes is required. Impact-resistant goggles should be used when protection from flying particles is needed (such as when working with pressure or vacuum operations).

- **Face Shields.** Face shields can be used in conjunction with safety glasses or goggles to provide protection for the face and neck.

- **Skin Protection.** Skin contact is a potential source of exposure to hazardous materials. Protective apparel that can protect the skin includes:

  - **Gloves.** Hands have a great potential for skin exposure; therefore, gloves should be worn whenever it is necessary to handle corrosive materials, sharp-edged objects, very hot or very cold materials, or toxics. When using gloves, the following should be considered:

    - Gloves should be selected on the basis of the material being handled, the hazard involved, and their suitability for the operation being conducted.
    - Gloves should be inspected for discoloration, punctures, and tears before each use.
    - Information should be obtained from glove manufacturers regarding uses for specific types of gloves. The manufacturer's data (such as permeation rate and thickness) should be used to determine safe time limits for specific uses.

- **Body Protection:**

  - Use Laboratory coat
  - Full length pants (or equivalent)
  - Close Toe shoe

Aprons. Rubber aprons provide good protection from corrosive liquids but may complicate injuries in the event of fire.

Personal protective equipment and safety and emergency equipment are necessary to ensure that exposures to laboratory personnel are kept to a minimum and within safe levels.

Safety and emergency equipment is available and maintained in good operating condition in all laboratories. All laboratory personnel are aware of the equipment location and of its proper use. The following safety and emergency equipment are considered as minimum standard

requirements for all laboratories:

- **Telephones.** Telephones for emergency use are readily available to laboratory personnel. Emergency phone numbers should be clearly identified.

- **Fire Alarms.** Equipped with automatic fire sprinkler, fire detection and alarm systems.

- **Fire Extinguishers.** Each chemical laboratory is provided with either a carbon dioxide or dry chemical extinguisher, or both. Other extinguishers (such as Class D type) should be available if required by the work being done. Fire extinguisher locations are clearly identified and near exits to ensure safe egress. Each fire extinguisher is recharged and certified at least annually, with monthly inspections between annual recharging.

Emergency Shower and Eye Wash Station: 29 CFR 1910.151(c)

Emergency Shower and Eye Wash Station must be in an area that requires no more than 10 seconds to reach. Emergency Shower and Eye Wash Station must be in well-lit area.

- Deluge or Quick Drench Showers. Showers are installed in or near laboratories, chemical preparation, or chemical storage areas, especially if corrosives or toxics are handled. Safety showers are tested at periodic, regular intervals. All laboratory personnel are trained in the proper use of the shower.
- Eyewash Stations. Each chemical laboratory and preparation area is installed with an eyewash station. The station provides at least 15 minutes of aerated water flow.

Responsibilities

- **Maintenance Department:**
  - Will be responsible for the preventive maintenance of the various eyewash and showers stations throughout the facilities.
  - Will conduct the annual flow rate testing and verify proper operation of the emergency eyewash and shower stations throughout the facilities
  - Will be assisting Laboratory personnel with any adjustment necessary to be in compliance with the stations.
- **Laboratory Technician:**
  - Will be performing monthly flush and verify proper operation of the emergency eyewash and shower stations throughout the facilities.
  - Documentation of all the testing will be maintained by the department.
  - Work closely with maintenance department to maintain an accurate inventory of the emergency eyewash and shower stations throughout the facilities.
- **EHS and Risk Management:**

- Must be aware of the locations of these emergency units and will make sure that these units are not obstructed.
- Assists department by reviewing the monthly tag of the individual units. Notify department if any unit is missing the monthly flush test.

- **Non-functional unit:** If the emergency unit is not operating to specifications, EHS would notify the supervisors and employees to initiate appropriate action. EHS will implement appropriate tagging of unit as "DO NOT USE", notify maintenance department for repair or replacement.

Monthly Test:

- Laboratory technician is responsible to carry out the monthly tests.
- Monthly test includes visual inspection of the unit, look for leaks or pipe damage and proper placement of protective covers. This should be done prior to testing in order to avoid further damage to the unit and risk of injury to users. Ensure that the unit is free of any obstructions.
- Activate unit. Ensure that the water flow is continuous, evaluate that the unit can maintain flow for 15 minutes, and is not injurious to the user's eye or face. Valve actuator must activate water flow in one second or less.
- Controlled flow of flushing fluid must be provided to both eyes simultaneously.
- Sanitize water supply through monthly flushing. In order to relieve the unit of any rust and other pipe build-up, flush the unit until the water runs clear.
- Document test with dates and initials on unit tag. EHS is responsible to ensure an appropriate tag is on all units.

The unit must be capable of delivering not less than 0.4 gallons per minute of flushing fluid for 15 minutes.

Annual Flow Test:

- Maintenance department is responsible for annual flow tests for eyewash and shower station.
- Plumbed and self-contained showers must maintain a minimum flushing fluid of 20 gallons per minute (GPM) at 30 pounds per square inch (PSI) for a minimum of 15 minutes.
- Plumbed and Self-Contained Eyewash Equipment must maintain a minimum flushing fluid of 0.4 GPM at 30 psi for 15 minutes.
- Eye/Face wash equipment must maintain a minimum flushing fluid of 3 GPM at 30 PSI for 15 minutes

Training

ANSI Z358.1-2014 states that employees who may be exposed to hazardous materials must be trained on the use of eyewash and shower devices. Specific areas that should be addressed include the location of the units, how to properly activate the systems and how to correctly maintain the devices. EHS is responsible to conduct training for the employees.

Sources

ANSI/ISEA Z358.1-2014

Miscellaneous emergency equipment:

- Spill clean-up stations.
- Eye protection equipment storage cabinets.

Hygiene Practices

The three most common routes of entry of hazardous chemicals into the body are inhalation, ingestion, and skin contact. All exposures to hazardous chemicals that may result in harmful effects on the body can be reduced by implementing and enforcing good personal hygiene practices.

Basic rules for good hygiene in chemical and biological laboratories include:

- Minimize all chemical exposures.
- While dealing with hazardous chemicals, use buddy system.
- Work with chemicals should only be done in well-ventilated areas.
- Promptly flush any area of the skin, which has become contaminated with any laboratory chemical.
- Do NOT smell or taste any laboratory chemical.
- Inspect all personal protective equipment (such as gloves, goggles, and respirators) before use.
- Do not work with chemicals outside the designated work area (outside the laboratory) to avoid air contamination.
- Avoid eating, drinking, smoking, gum chewing, and the application of cosmetics in areas where laboratory chemicals are stored, used, or otherwise handled.
- Avoid storage, handling, preparation, or consumption of food or beverages in chemical storage or preparation areas.
- Always wash hands after chemical handling and before eating, drinking, smoking, or the applying of cosmetics.

Housekeeping

Housekeeping inspections are important functions that support a clean and safe work area and help to reduce exposures to laboratory personnel. Following are minimum guidelines for these functions.

- Floors in laboratories, stockrooms, preparation rooms, and storerooms should be cleaned regularly (at least daily in laboratories and prep rooms).
- Stairways, hallways, and passageways should not be used as storage areas.
- Stairways, hallways, passageways, exits, and any other means of emergency egress should always be kept clear and in good repair.
- Trash should be removed daily.
- Chemical containers should not be stored on floors.
- Waste should be placed in appropriate receptacles.
- Chemical spills should be cleaned up immediately and the waste properly disposed. Unlabeled containers and chemical waste should be properly disposed within the regulatory mandated time frame.
- Chemical inventories should be updated at least annually. All chemicals expired chemical/s must be removed and properly disposed.
- Access to utility controls and emergency equipment should be kept free and clear at all times.
- Chemical Stockrooms must have restricted access. Cleaning of the chemical stockroom must be a coordinated effort between custodial department and chemical stockroom supervisor.

Housekeeping Inspections

Formal housekeeping and chemical hygiene inspections will be conducted annually by the Laboratory Technician by the beginning of the Fall semester. The inspection checklists provided in Appendix C will be used and completed for each laboratory inspection and will be kept on file for recordkeeping purposes for at least 5 years. The completed checklist will be forwarded to the Environmental Safety/Emergency Services Manager.

Egress/Life Safety

Science building operations increase the potential of emergency situations that may require building evacuation. Events such as fires, explosions, and spills may require or cause alarms to be activated followed by the evacuation of the building. The means of egress will follow the local and State of California regulations, which involve building occupancy.

Signs & Labels

One way of reducing exposures to laboratory personnel is to ensure that appropriate warnings are provided prior to exposure. All posted signs and labels should be clearly visible and maintained in good condition. Signs and labels should include:

- Emergency information:
  - Important telephone numbers.
  - MT. SAC's policy regarding Emergencies is to call "911"
- Location signs:
  - Eyewash stations.
  - Deluge showers.
  - First aid equipment.
  - Fire extinguishers.
  - Exits.
- Warnings for areas or equipment which pose special hazards:
  - Flammable storage areas.
  - Oxidizer storage areas.
  - Bulk corrosives storage areas.
  - Toxic storage.

- ♦ Radioactive.
- ♦ Biohazards.
- ♦ Extremely hot or cold equipment.

- Miscellaneous signs:
  - ♦ Identify where food and beverage storage and/or consumption are not permitted.
  - ♦ Identify “NO SMOKING” areas.
- Container labeling:
  - ♦ Labels on incoming containers should not be removed or defaced.
  - ♦ All chemical containers should be labeled with at least the chemical identity or contents and hazard warnings.
  - ♦ Carcinogens should be clearly labeled as such.
  - ♦ Hazardous waste containers should be labeled “HAZARDOUS WASTE”, the waste type identified, and the date accumulation began noted on the label.

Spills & Accidents

Laboratories may be subject to several emergencies including chemical spills, fire, explosion, personnel contamination, broken glass, and loss of critical utility services. The Environmental Safety/Emergency Services Manager and all laboratory personnel will be prepared to react to any potential hazard.

Section III

Standard Operating Procedures
For Chemical Storage & Use

As stated in prior sections, all hazardous substances should be stored, handled, and used in accordance with the information provided by the manufacturer through container labeling and the SDS. In addition, technical references can provide general safety precautions for the storage and use of both specific chemicals and general categories of hazardous materials.

The following standard operating procedures are provided as basic procedures intended to ensure a safe and healthful workplace for laboratory personnel during the use of hazardous laboratory chemicals. These procedures are provided for basic "groups" or "families" of chemicals and should be used in conjunction with appropriate SDS to ensure specific operating procedures are known for individual chemicals.

Chemical Storage

Chemical storage should generally be limited to only those rooms designed and designated for chemical storage. Laboratories should only be used for short-term storage and for only the reagents necessary for the current project. Chemical storage facilities should consider the following:

- Control of access.
- Adequate space for safe storage.
- Segregation of incompatibles.
- Flammable Liquid storage.
- Corrosives storage.
- Toxics storage.
- Compressed gases storage.
- General chemical storage.
- Hazardous Waste storage.

Flammable/Combustible Liquids

- Store in a well-ventilated area away from oxidizers, ordinary combustibles, and sources of heat or ignition.
- Always store in covered containers.
- Use approved safety cans for dispensing at the point of operation.
- Air pressure will never be used to remove liquids from a drum or tank.
- Provide spill containment for drum and bulk storage areas.
- Storerooms used for flammables must have either gravity or mechanical ventilation. Mechanical ventilation is required if Class I flammable liquids (flash point below 100˚ F) are dispensed.
- Flammable liquids stored in work areas or general-purpose storerooms in quantities exceeding 10 gallons, should be stored in approved flammable liquid storage cabinets.
- All flammable liquid storage areas should be clearly identified with signs or symbols.
- Flammables used at the point of operation should not be dispensed from containers larger than one (1) gallon, unless from an approved safety can. If an approved safety can is used to dispense flammables, then the can may be up to two (2) gallons in size.
- Strong consideration should be given to using only approved safety cans to dispense flammable liquids at the point of operation.
- Appropriate fire extinguishers for Class B (flammable or combustible liquid) fires should be available within 50 feet from where flammable liquids are stored or used.
- Flammable materials storage and use areas should be clearly marked “NO SMOKING OR OPEN FLAME”.

Chlorinated Hydrocarbons/Solvents

- Use only in well-ventilated areas.
- Do NOT use from open containers unless ventilation is adequate to draw vapors from the work area.
- Keep away from open flames or excessive heat.

- Provide spill containment for drum or bulk storage areas.

Oxidizers

- Store in a well-ventilated area.
- Store away from combustibles, organic matter, reducing agents, and sources of heat or ignition.
- Keep oxygen cylinders free of oil, grease, dirt, or other contaminants.

Compressed Gases/Aerosols

- Compressed gas cylinders will always be stored away from external heat sources and located such that they will not be damaged by passing or falling objects. When possible, they will be stored upright with the cylinder secured.
- Cylinders not in use will be stored with valve protection caps in place.
- Oxygen cylinders in storage will be segregated from flammable gas cylinders (such as acetylene and hydrogen) by at least 20 feet or by a non-combustible wall at least 5 feet high.
- Oxygen cylinder storage areas will be clearly marked “OXIDIZER”.
- Flammable gas cylinder storage areas will be clearly marked “FLAMMABLE GAS” and “NO SMOKING OR OPEN FLAME”.
- All gas cylinders will be clearly marked either “FULL” or “EMPTY”.
- All compressed gas cylinders will be legibly marked with the chemical or trade name of the gas.
- Empty cylinders should not be refilled except by the supplier.
- All gas cylinder connecting hoses, couplings, and pressure regulators will be regularly inspected for defects.
- When appropriate, a check valve or trap will be installed in the discharge line to prevent hazardous back flow into the cylinder.
- Aerosols will not be stored in areas where the temperature may exceed 120˚F.

Corrosives

Corrosives pose an immediate danger to personnel upon contact to any human tissue. Because of the acute health hazard and the potential for permanent injury, the following apply:

- Storage and use of corrosives will be in well-ventilated areas.
- When feasible, corrosives will be stored in cabinets dedicated to corrosive storage.
- Bulk storage areas will have spill containment barriers.
- Large bottles containing corrosives are to be transported in appropriate bottle carriers.

- Acids will be segregated from substances that they are reactive with (such as metals, metal oxides, hydroxides, amines, carbonates, and other alkaline materials).

- Acids will be segregated from chemicals that generate toxic gases upon contact (such as chlorides, cyanates, cyanides, fluorides, hydrides, and sulfides).

- Oxidizing acids will be segregated from organic acids and flammables.

- Nitric acid will be segregated from all other acids.

- Personnel using or handling corrosives should always wear splash-proof eye goggles.

- Personnel involved in any operation using corrosives with a high probability of splashing, should be required to wear face shields, rubber gloves, and Laboratory cost, splash-proof eye goggles.

- Areas where corrosives are stored or used in one gallon containers (or larger) should be equipped with plumbed-in eyewash stations and deluge showers.

- Due to the potential for falls, spills, splashes, and personnel contamination from storage at high levels, corrosives should be stored at or below waist level.

- Corrosives in laboratories should be stored in approved corrosive storage cabinets. Small quantities may be stored on shelves in polyethylene or ceramic trays to contain spills or leaks.

- Personnel using corrosives should be aware of the potential for permanent eye damage should a corrosive contact the eye. Therefore, persons using corrosives should be familiar with the sources in their workplace for eye flushing and the proper technique (eyelids must be rolled during flushing and the eye should be flushed for at least 15 minutes). Emergency procedures for eye contact with a corrosive should always include contacting a physician.

Toxics

- Storage will only be in containers clearly marked "POISON".
- When feasible, storage containers will be kept in a dedicated cabinet, clearly labeled, and kept locked.
- Toxics should only be used and stored in well-ventilated areas.
- Cyanides, chlorides, and sulfides will be segregated from acids.
- The cabinets or rooms used for the storage of highly toxic materials should have appropriate warnings, and poison control phone numbers posted.
- Access to the cabinets or rooms should be controlled with only authorized personnel permitted access.
- Highly toxic substances should be used in the classroom only after a review of health hazards, routes of entry, safety precautions, and first aid. And then, only used under the strict supervision of the instructor.

Reactive

- Storage should only be in cool, dry, well-ventilated areas.
- Reactive chemicals should be kept away from sources of heat and ignition.

- Purchase should only be in quantities that can be used during one school semester.

- Water reactive materials should not be stored in a room with an automatic water sprinkler system unless precautions have been taken to ensure that the materials can remain dry in the event of sprinkler activation.

- Pyrophoric materials such as sodium, potassium, lithium, and strontium should be segregated from halogenated hydrocarbons, oxidizers, and moisture. Storage should only be in containers with the materials completely covered with an oxygen free liquid (such as toluene, kerosene, or mineral oil).

- Amorphous phosphorus (red phosphorus) is a reddish-violet powder that is not considered toxic in its pure form. It is stable under ordinary conditions, however is flammable and can be initiated by excessive shock or friction.
- Yellow phosphorus (white phosphorus) is a significantly more hazardous form of the element and may be present as a contaminant in red phosphorus. This allotrope of phosphorus is extremely toxic and the estimated human lethal dose is 50 - 100 mg. This form must be stored under water as it burns rapidly and is spontaneously combustible upon exposure to air.
- Keep red phosphorus in tightly sealed containers in a cool dry place, separate from incompatible materials. Keep yellow phosphorus or contaminated amorphous phosphorus in sealed containers under water to avoid exposure to air.

Organic Peroxides

Organic peroxides have unusual stability problems, which make them among the most hazardous substances handled in laboratories. As a class, they are low-power explosives sensitive to shock, sparks, heat, friction, strong oxidizing agents, and reducing agents. The following types of compounds are known to form peroxides:

- Aldehydes
- Ethers
- Compounds containing benzylic hydrogen atoms (e.g., cumene)
- Alkenes
- Vinyl and vinylidene compounds

Some specific chemicals from the above categories commonly found in laboratories include Diisopropyl Ether, Ethyl Ether, Tetrahydrofuran, Tetrahydronaphthalene, Cyclohexene, P-Dioxane, and Dicahydronaphthalene.

Preventive measures for peroxides include:

- Minimize the quantities of peroxide former and peroxides in the laboratory.
- Unused peroxides should not be returned to the container.
- All spills should be cleaned up immediately; peroxide solutions can be absorbed on vermiculite.
- The sensitivity of most peroxides to shock and heat can be reduced by dilution with an inert solvent. However, solutions of peroxides diluted in volatile solvents should not be used under conditions in which the solvent may be vaporized.
- Do NOT use metal utensils to handle peroxides. Ceramic or wooden utensils are acceptable. Smoking, open flames, friction, grinding, other heat sources, and all forms of impact should be avoided near peroxides.
- Do not use glass containers that have screw-cap lids or glass stoppers to store peroxides.
- Peroxides should be stored at the lowest possible, appropriate temperature.
- Never dispose pure peroxides directly. Peroxides must be diluted before disposal.

Section IV

Control Measures For
Extremely Hazardous Substances

General precautions to be followed when working with any chemical that has been identified in the Standard Operating Procedures, Section I of this Plan. These general rules, procedures, and precautions should be reviewed and followed, as the basic foundation for safety when working with the following:

- Substances of moderate, chronic, or high acute toxicity.
- Substances of high known high chronic toxicity.
- Cal-OSHA or Federal OSHA listed carcinogens.

Additional control measures are appropriate when working with any substance falling into one of the above categories. Following is an identification of appropriate, additional safety procedures for each group:

Substances of Moderate, Chronic, or High Acute Toxicity

- Follow all general rules, procedures, and precautions as discussed throughout this Plan.
- Review the SDS or consult a reference resource, which identifies toxic properties to learn or refresh what is known about the substance(s) that will be used.
- Maintain records of the material, amounts used, and laboratory personnel involved.
- Procedures involving volatile toxic substances or those that may generate aerosols should be conducted in a hood or other suitable containment device.
- Plan to contain accidental spills in the hood by storing containers of chemicals in this group in polyethylene pans or trays or fit the hood with a removable liner of absorbent plastic backed paper.
- If special toxicity hazards exist, the work area should be posted “RESTRICTED ACCESS”. DO WE HAVE THESE POSTINGS CORRECT?
- Whenever cyanides are used or stored in hoods, warning or no admittance signs should be posted on doors to fan lofts and roofs (where the hood exhausts).

- A hydrogen cyanide gas (HCN) first aid kit, and an oxygen cylinder equipped with pressure gauge and needle valve, should be available on any floor of a building on which work with cyanides is in progress. The oxygen cylinder should be clearly marked for emergency HCN first aid. The HCN first aid kit should contain a box of amyl nitrate pearls, a face piece, rubber tubing for administering oxygen, and a bottle of 1% sodium thiosulfate solution.

  Note: Only trained and qualified emergency response personnel are authorized to use an HCN first aid kit.

- Wastes of chemicals in this category should be placed in closed impervious containers. The containers should be labeled with the contents, type of hazard, and the date in which accumulation began.

- Only personnel wearing appropriate, personal protective equipment and that has proper training should clean up spills.

- If work is to be done with highly or extremely toxic materials, at least two individuals should be present at all times.

Substances of Known High Chronic Toxicity

- Follow all rules, procedures, and precautions identified above.

- Any experimental work and disposal procedures for waste should go via EHS before approved by the DEAN.

- Consultation with the department or site safety coordinator may be appropriate.

- All chemical containers should be clearly labeled with appropriate hazard warnings (e.g. “WARNING! HIGH CHRONIC TOXICITY” or “WARNING! CANCER SUSPECT AGENT”).

- All work of this nature should be done in a controlled area (such as a laboratory, portion of a laboratory, exhaust hood, or glove box designed and designated for use with highly toxic materials).

- Controlled areas should be clearly marked with signs such as the following:

  - WARNING! TOXIC SUBSTANCE IN USE: AUTHORIZED PERSONNEL ONLY.
  - WARNING! CANCER SUSPECT AGENT: AUTHORIZED PERSONNEL ONLY.

- Appropriate personal protective apparel should be worn when transferring or handling substances of high chronic toxicity.

- Laboratory personnel should remove any protective apparel when leaving the controlled

area, and thoroughly wash hands, forearms, face, and neck.

- Disposable apparel or absorbent paper liners should be placed in closed, impervious containers that are properly labeled. Non-disposable apparel should be thoroughly washed.

- Normal laboratory work should not be resumed in an area that has been used as a controlled area, until it has been adequately decontaminated.

Working With Carcinogens or Suspected Carcinogens

- Obtain written approval from both Management and Environmental Safety/Emergency Services Manager prior to using.

- Use only in a designated area with suitable warning signs to alert other workers, e.g., Danger, Cancer Hazard.

- Wear protective clothing and use the approved fume hood or other engineering controls.

- Use and store materials in a chemically resistant container in an appropriately ventilated limited-access area.

- Decontaminate the designated area and all equipment in the hood before removing them.

- Use a wet method to clean up liquids. For dry materials, use a vacuum with a HEPA filter vented into the hood.

- All waste must be stored in a closed, labeled, and impervious container.

Chemical Procurement

An effective purchasing plan is available to tract various chemicals purchased throughout MT. SAC Plan begins with appropriate purchasing guidelines and controls. The disposal of hazardous materials is becoming increasingly difficult with rapidly escalating costs. Inadequate purchasing procedures will only complicate disposal problems. Basic procurement guidelines include:

- Before a substance is procured, information on proper handling, storage, and disposal should be known by all personnel involved in storage, handling, use, and disposal.

- No chemical container (including gas cylinders) should be accepted without adequate identifying labels.

- All the substances should be received in a MT.SAC warehouse.
- Donated substances and substances purchased outside of normal purchasing procedures are strictly prohibited unless prior written approval is given by the supervisor or department head. Personnel bringing unauthorized substances into the work area may be held responsible for all removal and disposal costs incurred by MT. SAC.

- Hazardous materials should only be purchased which can be used in a school year.

- Extremely hazardous materials should only be purchased in quantities necessary for a designated procedure and should not exceed an amount that can be used in a single semester, if possible.

- General categories of materials to avoid are:

    - Carcinogens

    - Explosives

    - Highly or extremely toxic substances

The following procedures are in place to purchase chemical/s at MT.SAC:

- *All requests are made by the Faculty to the Laboratory Technician.*

- *The Laboratory Technician reviews the request.*

- *The Laboratory technician reviews the Safety Data sheet (SDS) and the hazards associated with the product.*

- *If the product is deemed a significant hazard, the Laboratory Technician takes the request to the Faculty member making the request to discuss the educational value in relation to the hazard.*

- *The Laboratory Technician creates the chemical purchase request for approval and purchase.*

- *Upon creating the purchase request, the Laboratory Technician must complete the Chemical Purchase Tracking Smart sheet on the purchasing website.*

SECTION V
Workers Compensation Exposure

MT. SAC's Risk Management office will need to be contacted immediately to report the exposure. The risk management office will take reasonable and appropriate action to obtain information pertaining to the exposure. The risk management office will provide the workers compensation physician with information regarding the exposure. Mt SAC will follow the guidelines set forth in the California Labor Code as it relates to a Workers Compensation exposure.

SECTION VI

Employee Information & Training

Goal

MT. SAC will make available an information and training program to all laboratory employees. The goal of this program is to ensure that all laboratory personnel are adequately informed about laboratory work, appraisal of the hazards of chemicals present in the laboratory, and that they are knowledgeable in what to do if an accident occurs.

FREQUENCY

MT. SAC will take appropriate action to provide initial employee training and information at the inception of the Chemical Hygiene Plan, or at the time of an employee's initial assignment to a laboratory covered under this Plan. Employees will also receive appropriate training prior to assignments involving new exposure situations. *The new employees will be trained at the beginning of each semester. They will be provided a copy of the plan and the Laboratory Technician (Stockroom Supervisor) will provide information on the job specific hazards and work practices in the lab. MT. SAC believes that training should be a regular, continuing activity; therefore, refresher training will be provided at periodic, regular intervals. The basic rule is to provide refresher training once per year, which will be provided by the Environmental Safety/Emergency Services Manager. This frequency may be adjusted up or down depending on needs and assessments done by the Environmental Safety/Emergency Services Manager*.

CONTENT

MT. SAC will provide an education program, which will give employees adequate information and training to work safely around hazardous chemicals and laboratory equipment. At a minimum, the employee education program will consist of the following:

- Information employees will be informed of:
  - The contents of Title 8, Section 5191, "Occupational Exposure to Hazardous Chemicals in Laboratories".
  - The location and availability of the Chemical Hygiene Plan.
  - Exposure limits and action levels for Cal-OSHA regulated substances or recommended exposure limits for other hazardous chemicals not covered by an applicable Cal-OSHA regulation.
  - Signs and symptoms associated with exposures to hazardous chemicals.

- The location and availability of the SDS.
- The location and availability of additional reference materials relating, but not limited to, safe laboratory practices, chemical handling, chemical storage, chemical disposal, and emergency procedures.

- Employees will be trained in:
  - Methods and observations which may be used to detect the presence or release of a hazardous chemical.
  - The physical and health hazards of chemicals in the laboratory work areas.
  - Measures which can be taken to protect oneself from health and physical hazards.
  - The applicable details of MT. SAC's written Chemical Hygiene Plan.

Appendix A

Chemical Hygiene Responsibilities

Chemical Hygiene Responsibilities:

Responsibility for chemical hygiene rests at all levels including the:

1. *MT. SAC President*, who has ultimate responsibility for chemical hygiene within the institution and must with other administrators, provide continuing support for institutional chemical hygiene.

2. *Division Dean or Department Head* who are responsible for chemical hygiene in that unit and monitoring procurement of chemicals through assistance of the Environmental Safety/Emergency Services Manager.

3. Environmental Safety/Emergency Services Manager , whose appointment is essential and who must:
   a. Work with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices.
   b. Monitor procurement, use and disposal of chemicals used in the lab.
   c. See that appropriate audits and inspection records are maintained and results provided to the Safety Committee.
   d. Help project directors develop precautions and adequate facilities.
   e. Know the current legal requirements concerning regulated substances.
   f. Seek ways to improve the chemical hygiene program; and
   g. Update the Chemical Hygiene Plan and submit proposed changes to the Safety Committee at least annually.

4. *Laboratory Technician,*
   a. Ensure that workers know and follow the chemical hygiene rules, which protective equipment is available and in working order, and that appropriate training has been provided.
   b. Provide regular, formal chemical hygiene and housekeeping inspections including monthly inspections of emergency equipment (eyewash stations and deluge showers).
   c. Conduct fume hood surveys at least annually to ensure the units are operating at the proper ventilation rate (surveys may be conducted at the beginning of each semester as directed by the Environmental Safety/Emergency Services Manager).
   d. Know the current legal requirements concerning regulated substances.
   e. Determine the required levels of protective apparel and equipment.
   f. Ensure that facilities and training for use of any materials being ordered are adequate.

5. *Laboratory Student Worker,* who is responsible for:
   a. Planning and conducting each operation in accordance with the institutional chemical hygiene procedures; and
   b. Developing good personal chemical hygiene habits.

6. *Facilities Planning and Management*

a. Performing regular preventative maintenance on the general and local ventilation (fume hoods) in the laboratories.

b. Perform repairs on the emergency equipment and ventilation systems in the laboratories as reported or as needed.

Appendix B

Basic Laboratory Safety Rules

The Chemical Hygiene Plan requires that laboratory personnel know and follow basic rules and procedures for working with chemicals. The basic rules and procedures lay the foundation for laboratory safety, and better comprehension of specific procedures as identified on the SDS and other sources for individual chemicals. The basic rules and procedures that should be used for essentially all laboratory work with chemicals include the following:

Accidents/Spills

- **Eye Contact:** Promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention.

- **Ingestion:** Encourage the victim to drink large amounts of water and seek medical attention.

- **Skin Contact:** Promptly flush the affected area with water for at least 15 minutes and remove any contaminated clothing. If symptoms persist after washing, seek medical attention.

- **Leaks/Spills**: Promptly cleanup leaks/spills using appropriate protective apparel, and the proper equipment and disposal methods. Ventilate the area, if necessary, and keep unnecessary and unprotected persons away from the area. Further information and instructions on clean-up can be obtained for specific chemicals by reading the SDS for that chemical.

Avoidance of "Routine" Exposure

- Develop and encourage safe habits.

- Avoid unnecessary exposure to chemicals by any route.

- Do not smell or taste chemicals.

- Vent any apparatus (vacuum pumps, distillation columns, etc.) that may discharge toxic chemicals into local exhaust devices.

- Inspect gloves and test glove boxes before use.

- Do NOT allow the release of toxic substances in cold rooms or hot rooms since they contain recirculated atmospheres.

Choice of Chemicals

- Use only those chemicals for which the quality of the available ventilation system is appropriate

Eating, Smoking, Etc.

- Avoid eating, drinking, smoking, gum chewing, or application of cosmetics in areas where laboratory chemicals are present. Wash hands before conducting these activities. Avoid storage, handling, or consumption of food or beverages in storage areas, refrigerators, glassware, or utensils that are also used for laboratory operations.

Equipment & Glassware

- Handle and store laboratory glassware with care to avoid damage.
- Do NOT use damaged glassware.
- Use extra care with Dewar flasks and other evacuated glass apparatus.
- Shield or wrap them to contain chemicals and fragments should implosion occur.
- Use equipment only for its designed purpose.

Exiting

- Wash areas of exposed skin well before leaving the laboratory.

Horseplay

- Avoid practical jokes or other behavior that might confuse, startle, or distract another worker.

Mouth Suction

- Do NOT use mouth suction for piping or starting a siphon.

Personal Apparel

- Confine long hair and loose clothing.
- Wear shoes at all times in the laboratory, but do not wear sandals, perforated shoes, or sneakers.

Housekeeping

- Keep the work area clean and uncluttered, with chemicals and equipment being properly labeled and stored.

- Clean up the work area upon completion of an operation or at the end of each day.

Personal Protection

- Assure that appropriate eye protection is worn by all persons (including visitors), where chemicals are stored or handled.

- Wear appropriate gloves when the potential for contact with toxic materials exists, inspect the gloves before each use, wash them before removal, and replace them periodically. Information on ordering gloves can be obtained through Lab Safety Supply at (800) 356-0783. A table listing various types of gloves and their applications are listed below:

Glove Type	Applications
Rubber, Plastic, or Synthetic Rubber Gloves (Neoprene & Nitrile)	Should be used for tasks involving oils, greases, solvents, and other chemicals such as acids and caustics. This type of glove can be applied to cleaning tasks.
Leather	Resists sparks, moderate heat, cuts, and abrasions. This type of glove can be applied to welding activities.
Cotton & Fabric	Protect against dirt, chafing, and abrasions. This type of glove may not be strong enough to endure rough, sharp, or heavy materials.
Coated Fabric	Provides protection for moderately concentrated chemicals. This type of glove can be used in laboratory tasks, provided it offers protection for the specific chemical hazard associated with the task.
Aluminized	Provides reflective and insulated protection. This type of glove can be used in welding, furnace, and foundry work.
Kevlar	Provides protection against hot and cold. This type of glove can be used in a wide variety of industrial applications.

- Use appropriate respiratory equipment when air contaminant concentrations are not sufficiently restricted by engineering controls or when inspecting the respirator before use.

- Use any other protective and emergency apparel and equipment as appropriate.

- Avoid the use of contact lenses in the laboratory unless necessary. If they are used, inform supervisor so special precautions can be taken.

- Remove laboratory coats immediately on significant contamination.

Planning

- Seek information and advice about hazards.

- Plan appropriate protective procedures.

- Plan positioning of equipment before beginning any new operation.

Unattended Operations

- Leave lights on.

- Place an appropriate sign on the door.

- Provide for containment of toxic substances in the event of failure of a utility service (such as cooling water) to an unattended operation.

Use of Hood

- Use the hood for operations that might result in the release of toxic chemical vapors or dust.

- As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a TLV of less than 50 ppm.

- Confirm adequate hood performance before use.

- Keep hood sash closed at all times except when adjustments within the hood are being made.

- Keep materials stored in hoods to a minimum and do not allow them to block vents or airflow.

- Leave the hood "ON" when it is not in active use if toxic substances are stored in it, or if it is uncertain whether an adequate general laboratory ventilator will be maintained when it is "OFF".

Vigilance

- Be alert to unsafe conditions and see that they are corrected when

detected.

Waste Disposal

Majorities of chemicals handled at various laboratories in MT. SAC are hazardous. As result, all hazardous waste shall be managed in accordance with federal, state, and local regulations.

Proper Handling of Chemical Hazardous Waste

I. A laboratory chemical becomes a waste when you no longer intend to use or reuse the chemical. It is at this point in time when the chemical must be managed as a hazardous waste. Ensure that the plan for each laboratory operation includes plans and training for waste disposal.
II. All laboratory waste containers must be:
    a. In good condition with no leaks or cracks
    b. Kept closed except when adding waste
    c. Segregated from other incompatible wastes
    d. Stored in secondary containment, if necessary
    e. Affixed with a completed Hazardous Waste Label.
III. Chemical labels must have the following:
    a. The complete chemical name(s) must be labeled in English on the container.
    b. Chemical abbreviations or nomenclature ARE NOT ACCEPTABLE,
    c. Nor are generalizations such as “halogenated waste”.
IV. Currently at MT.SAC hazardous wastes are disposed monthly.
V. Contact EHS for any emergency hazardous waste disposal.
VI. Laboratory personnel handling hazardous chemicals must be trained.
VII. Unknown chemical waste disposal. In case unknown waste at the laboratories contact EHS for disposal. In most case testing of the unknown chemicals may be needed to determine the characteristic of the waste via third party vendor.
VIII. Do NOT discharge to the sewer any concentrated acids or bases, highly toxic, malodorous, or lachrymatory substances, or any other substances which might interfere with the biological activity of wastewater treatment plants, create fire or explosion hazards, cause structural damage, or obstruct flow.

Working Alone

- Avoid working alone in a building.
- Do NOT work alone in a laboratory if the procedures being conducted are hazardous.
- If you are a woman of childbearing age, handle these substances only in a hood whose satisfactory performance has been confirmed, using appropriate protective apparel (especially gloves) to prevent skin contact.

- Review each use of the materials with the laboratory Supervisor and review continuing uses annually or whenever a procedural change is made.

- Store the substances, properly labeled, in an adequately ventilated area in an unbreakable secondary container.

- Notify supervisors and Environmental Safety/Emergency Manager immediately of all incidents of exposure or spills. Follow up with Risk Management on seeking medical treatment per the Workers Compensation law.

Appendix C

Laboratory Chemical Safety Checklist
Eyewash/Deluge Shower Inspection Checklist
Laboratory Safety Inspection Checklist

LABORATORY CHEMICAL SAFETY CHECKLIST

Room: _____ Building: _____
Inspection Date:_____ Dept: _____
Inspected By: _____

General		YYES	NNO	NN/A
1.	Emergency phone numbers and procedures are posted.	____	____	____
2.	Appropriate warning signs are posted on doors.	____	____	____
3.	Written Chemical Hygiene Plan is located in the department.	____	____	____
4.	All personnel know how were the SDS's are located.	____	____	____
5.	All personnel have received Lab Safety training.	____	____	____
6.	Signs noting the location of the first-aid safety equipment are visible.	____	____	____
7.	Lab coats are available.	____	____	____
8.	Chemical protective gloves are available.	____	____	____
9.	Safety glasses/goggles are available.	____	____	____
10.	An approved fire blanket is present and kept in an accessible location.			
10.	An emergency eyewash station is present and tested.	____	____	____
11.	An emergency shower is present and is tested.	____	____	____
12.	Refrigerators/freezers are clearly labeled for the type of storage. Those used for storing chemicals should be labeled “NOT FOR STORAGE OF FOOD”.	____	____	____
13.	Food and Beverage are not stored or consumed where they may become contaminated.	____	____	____
14.	Good housekeeping prevails and aisles are uncluttered without tripping hazards.	____	____	____
15.	Chemical spill kits are available.	____	____	____
16.	Non-contaminated sharp objects in labeled, puncture-proof containers.	____	____	____
17.	Fume hoods are tested annually for adequate airflow.	____	____	____
18.	All exit ways are clear and unobstructed.	____	____	____

19.	Fire extinguishers are available and unobstructed.	____	____	____
20.	There are ground fault circuit interrupters (GFI's) on electrical outlets near sinks.			
21.	Fire extinguishers have service tag and are sealed.	____	____	____
22.	The location of the master electrical and gas shut-off controls are clearly labeled and accessible.			
23.	Current inventory of chemicals is available.	____	____	____
Chemical Storage and Handling				
1.	Gas cylinders are properly secured.	____	____	____
2.	No leaking containers are present.	____	____	____
3.	All chemical containers are properly labeled.	____	____	____
4.	Chemicals are stored according to compatibility.	____	____	____
5.	Cabinets and open shelves are equipped with lips or barriers to prevent spilling of chemicals and protect containers from falling.			
6.	Peroxide forming reagents are dated when opened.	____	____	____
7.	Gas outlets and burners are maintained in safe working condition.			
8.	Peroxide forming reagents are disposed of or tested after exp. date.	____	____	____
9.	Flammable storage area(s) is labeled.	____	____	____
10.	Flammable liquids not stored outside of a storage cabinet in excess of 10 gallons.			
11.	Flammables are kept away from sources of heat, ignition, flames, etc.	____	____	____
12.	Flammable liquids are not stored in refrigerators, unless the refrigerator is certified as explosion-proof.			
13.	Corrosive chemical storage area(s) is labeled.	____	____	____
14.	Corrosive materials are stored on the lower shelves.	____	____	____
15.	Cal/OSHA carcinogen storage area(s) is labeled.	____	____	____
16.	Chemicals in the open are kept to a minimum.	____	____	____
17.	Flammable/Combustible liquids do not exceed NFPA storage limits.	____	____	____
18.	Flammable/Combustible liquids are stored in approved cabinets.	____	____	____
19.	Poisonous gases are not present.	____	____	____

Chemical Waste				
1.	Hazardous waste containers are properly labeled with name of all the chemical/s inside the container all and have tight fitting closed lids.	____	____	____
2.	Hazardous container have tight fitting closed lids and its secured at all time.	____	____	____
3.	Hazardous wastes are not stored beyond 90 days.	____	____	____

COMMENTS: _____
_____
_____
_____

Eyewash/Deluge Shower
Inspection Checklist

NOTE: The eyewash/deluge shower must be inspected at least monthly (CCR Title 8, Section 5162). Maintain a copy of this completed form at the facility and submit the original to MT. SAC Business Office by the first day of each month.

SITE: _____ **DATE:** _____

WORK AREA: _____**INSPECTOR:** _____

Eyewash & deluge shower station inspection	S	U	Comment
Eyewash/deluge shower clearly identified			
Eyewash nozzle shields are in place and in good condition			
Eyewash water flow remains on without the use of operator's hands			
Deluge shower water flow remains on without the use of operator's hands			
Eyewash water flow remains on until intentionally shut off			
Deluge shower water flow remains on until intentionally shut off			
Eyewash activation/line flush test			
Eyewash water flow rate is 3 gpm minimum			
Deluge shower activation/line flush test			
Deluge shower water flow rate is 30 gpm minimum			
General condition of eyewash/deluge shower			

S: Satisfactory
U: Unsatisfactory
GPM: Gallons Per Minute
lfm: Linear Feet per Minute

Laboratory Safety Inspection Checklist (Annual)

Building: _____Department: _____Date: _____

Inspector: _____Room: _____ Mail Code: _____

Job Title: _____ Phone: _____

Health and Safety Management

	Yes	No	N/A
Is there a Chemical Hygiene Program present?			
Are personnel trained in chemical health/physical hazards and laboratory safety?			
Do lab personnel have access to and are familiar with the use of Safety Data Sheets (MDSs)?			
Have personnel using biohazards, toxins, and regulated carcinogens been given documented special training?			
Are personnel instructed in emergency procedures (exits, location, and use of fire extinguishers, medical)?			
Have personnel been instructed on how to respond in the event of a chemical spill?			
Are complete training records and documents available for review by the Personnel Office and outside agencies?			
Have all hazards identified by the annual survey been abated? (Action records must be retained.)			
Do laboratory personnel perform semi-annual lab inspections? (Lab technician must retain records.)			

General Safety

	Yes	No	N/A
Are rooms and cabinets containing regulated carcinogens, biohazards, and radioactive materials labeled?			
Are work areas clean and uncluttered?			
Do employees know the location of the first aid kit and is it accessible?			
Is equipment greater than 5 feet tall seismically secured to prevent tipping during an earthquake?			
Do shelves have lips, wires, or other seismic restraints to prevent items from falling?			
Are food and beverages kept away from work areas and out of laboratory refrigerators or cabinets?			
Are fire extinguishers accessible and charged? (If not, please call Physical Plant Services.)			
Are sinks labeled, “Industrial Water – Do Not Drink”?			
Have personnel been instructed on the hazards of wearing contact lenses in the laboratory?			
Are protective gloves available and worn for laboratory procedures where skin absorption/irritation may occur?			
Are safety glasses or other eye protection available and worn in the laboratory?			

Laboratory Equipment

	Yes	No	N/A
Have chemical fume hoods been tested within the past year?			
Is storage in hoods kept to a minimum and is it placed so it does not impede proper airflow?			
Does fume hood draw air (test with a tissue on hood edge) and is alarm installed and working?			
Is the lab ventilation negative with respect to corridors and offices?			
Are rotating or moveable parts and belts guarded with screens having less than ¼ inch opening?			
Are refrigerators and freezers, which are used for storage of flammables, spark proof and properly labeled?			
Are non-spark proof refrigerators labeled as "Unsafe for Flammable Storage"?			
Are all gas cylinders restrained to prevent tipping or falling?			
Are valves of gas cylinders capped when not in use?			

Hazardous Materials

	Yes	No	N/A
Are chemicals labeled to identify contents and hazards?			
Are regulated carcinogens handled safely to reduce employee exposure?			
Are chemicals separated by hazard class and stored to prevent spills (acids, bases, oxidizers, flammables, etc.)?			
Are chemicals inventoried (chemical name, quantity on hand, amount used per year)?			
Are chemical wastes properly segregated and stored with Waste Pick-up Tags attached to the containers?			
Are all hazardous wastes disposed of and not poured into the sewer system?			
Is a plumbed emergency eyewash station available within 100 feet of all areas where chemicals may splash onto an employee's body?			
Is a plumbed emergency eyewash station available within 100 feet of all areas where chemicals may splash or mechanical hazards such as grinding?			
Are either and other peroxide formers dated?			
Are sharps stored in puncture-proof containers and labeled appropriately (infectious waste or hazardous waste)?			

Fire and Electrical Safety

	Yes	No	N/A
Are fire doors unobstructed and readily closeable?			
If greater than 10 gallons of flammables are stored, is an approved flammable storage cabinet used?			
Are flammable liquids stored in less than 1-gallon quantity or kept in less than 2-gallon safety cans?			
Are flammable liquids limited to 60 gallons per fire area?			
Are plugs, cords, and receptacles in good condition (no splices or frayed cords)?			
Is all equipment properly grounded?			
Are extension cords used? (These are not to be used in place of permanent wiring, running			

through walls, ceilings, doors, etc.)			
Are all electrical boxes, panels, receptacles, and fittings covered to protect against electrical shock?			
Are control switches, circuit breakers, electrical panels, and emergency power cabinets free of obstructions?			
Are circuit breakers labeled to indicate what equipment is served by each?			
Have all outlet adapters been removed? (Install additional outlets or use fused power strips if current demand is within the strip's rating.)			

Eyewash/Deluge shower

	Yes	No	N/A
Eyewash/deluge shower clearly identified			
Eyewash nozzle shields are in place and in good condition			
Access to eyewash/deluge shower is not obstructed			
Eyewash water flow remains on without the use of operator's hands			
Deluge shower water flow remains on without the use of operator's hands			
Eyewash water flow remains on until intentionally shut off			
Deluge shower water flow remains on until intentionally shut off			
Eyewash activation/line flush tested			
Eyewash water flow rate is 3 gallons per minute minimum			
Deluge shower activation/line flush tested			
Deluge shower water flow rate is 30 gallons per minute minimum			

Appendix D
Common Laboratory Chemicals
Storage Conditions & Disposal Guidelines

Storage, Use and Disposal Procedures

Introduction

Storage and use of hazardous substances are necessary for the continued operation of any school MT. SAC. Certain hazardous materials are necessary for their educational value in science labs, applied arts, vocational arts, technical arts, and fine arts. Maintenance, custodial, food service, duplicating and swimming pool service are all support areas which need hazardous materials to provide services to keep the MT. SAC operating. Since hazardous substances are a necessary to continued operation of an educational facility, it is important that the users of these substances practice safe storage, handling, and use procedures to ensure minimizing the loss potential.

Injury or illness to employees, students, or visitors, damage to MT. SAC owned or leased property and damage to property of others are all examples of the loss potential resulting from misuse of hazardous substances. Proper storage, handling and use procedures, and techniques will decrease the probability of loss both in terms of frequency and severity.

Labeling

All containers supplied by manufactures or suppliers and holding hazardous materials should have labeling that provides at least the chemical identity, a list of hazardous ingredients, hazard warnings and the name and address of the manufacturer or supplier. Portable containers, into which hazardous substances have been transferred to from properly labeled, larger containers must have labels that provide at least the chemical identity and hazard warnings. Employees should follow guidelines provided by the manufacturer or supplier for storage, handling, and use. Employees should not use chemical substances from unlabeled or improperly labeled containers.

Safety Data Sheets

Safety Data Sheets are documents prepared by the manufacturer or supplier of hazardous substances. This document contains pertinent information regarding health hazards and safety precautions necessary for use with a given substance. The data sheet contains information on storage patterns, storage conditions, incompatibilities, personal protective equipment, and other precautions necessary for safe use of the substance. Employees should be familiar with the contents of data sheets for the hazardous materials which they work with and where the data sheets are kept. Employees should be encouraged to review a data sheet before using a hazardous material.

Although container labels may have safety precaution information, the data sheet is generally more comprehensive in the scope and amount of information provided. Therefore, the data sheet should be considered an extremely important tool for obtaining information regarding safe storage, handling, and use procedures.

Personal and Other Protective Devices

Safety Data Sheets provide information on routes of entry (or how one may be exposed to a hazardous material), personal protective equipment and other methods of protection form over exposure. Once the user of a hazardous material knows the health hazards associated with the use of the material and how exposure occurs, the next step is to take appropriate action to prevent overexposure and the resulting health effect.

By knowing the route of entry (such as through inhalation, skin contact or ingestion), the user of hazardous materials can protect themselves by following the manufacturer's recommended procedures, using appropriate personal protective equipment practicing good personal hygiene and having other protective devices available as specified by the manufacturer.

Ventilation is an engineering control that is an important consideration in controlling personnel exposures to hazardous materials. All employees should be instructed to adhere to manufacturer's guidelines regarding use of hazardous materials and the ventilation required for safe use. If engineering controls are not feasible or do not reduce employee exposure to an appropriate level, then employee exposures should be reduced by limiting the amount of time of exposure (both frequency and duration) or by requiring the use of personal protective equipment.

Personal protective equipment includes such items as respiratory protective equipment, eye goggles, face shields, gloves, aprons, and boots. The data sheet will list all equipment that should be available when using a given hazardous substance. Personnel should not be using hazardous materials unless the appropriate personal protective equipment has been provided and they have been trained in the proper use of such equipment.

Other protective measures that can reduce the loss potential include the use or installation of appropriate fire extinguishers, eye wash stations, deluge or quick drench showers, spill kits and proper storage facilities.

Employees should not be required to work with or use hazardous substances for prolonged or repeated exposures unless proper precautions have been taken to keep exposures to safe levels.

General Procedures

As stated in prior sections, all hazardous substances should be stored, handled, and used in accordance with the information provided by the manufacturer through container labeling and Safety Data Sheets.

Flammable, Corrosive and Toxic substances constitute a large portion of the hazardous materials commonly found in school MT. SAC facilities. Therefore, the next three sections will discuss some of the safety precautions necessary when using these types of chemicals.

Flammables

Due to the severe loss potential inherent in the storage, handling, and use of flammables, special consideration must be given to their storage and use. The following guidelines apply:

- Store flammables in well-ventilated areas segregated from oxidizers, ordinary combustibles, and sources of ignition.
- Storerooms used for flammables must have either gravity or mechanical ventilation.
- Mechanical ventilation is required if Class I flammable liquids (flashpoint below l00°F) are dispensed.
- Flammable liquids stored in work areas or general-purpose storerooms in quantities exceeding 10 gallons should be stored in approved flammable liquid storage cabinets.
- Bulk storage of flammables in warehouses should not exceed four feet in height with at least three feet wide aisles around the storage.
- All flammable liquid storage areas should be clearly identified with signs or symbols.
- Flammables used at the point of operation should not be dispensed from containers larger than one (1) gallon unless from an approved safety can. If an approved safety can is used to dispense flammables, then the can may be up to two (2) gallons in size.
- Strong consideration should be given to using only approved safety cans to dispense flammable liquids at the point of operation.
- 55-gallon drums used for dispensing flammable liquids should be bonded and connected to a suitable ground.
- Appropriate fire extinguishers for class B (flammable or combustible liquid) flares should be available within 50 feet from where flammable liquids are stored or used.
- Flammable materials storage and use areas should be clearly marked "NO SMOKING OR OPEN FLAME".
- Flammable liquids, aerosols, and gases should only be used in well-ventilated areas.

Corrosives

Corrosives pose an immediate danger to personnel upon contact to any human tissue. Because of the acute health hazard and the potential for permanent injury, the following apply:

- Personnel using or handling corrosives should always wear splash proof eye goggles.

- Personnel involved in any operation using corrosives with a high probability of splashing, should be required to wear face shields, rubber gloves and rubber aprons in addition to the splash proof eye goggles.

- Areas where corrosives are stored or used in one gallon or larger containers should be equipped with plumbed-in eye wash stations and deluge showers.

- Due to the potential for falls, spills, splashes, and personnel contamination from storage at high levels, corrosives should be stored at or below waist level.

- Corrosives in laboratories should be stored in approved corrosive storage cabinets. Small quantities may be stored on shelves in polyethylene or ceramic trays to contain spills or leaks.

- Personnel using corrosives should be aware of the potential for permanent eye damage should a corrosive contact the eye. Therefore, persons using corrosives should be familiar with the sources in their workplace for eye flushing, and the proper technique for flushing (eyelids must be rolled during flushing and the eye should be flushed for at least 15 minutes). Emergency procedures for eye contact with a corrosive should always include contacting a physician.

Toxics

Any substance labeled or identified by the manufacturer as being toxic, highly toxic or poisonous should be kept in a locked cabinet or room dedicated for only poison storage. The cabinet or room should have appropriate warnings and poison control phone numbers posted. Access to the cabinets or rooms should be controlled with only authorized personnel permitted access. Highly toxic substances should be used in the classroom only after a review of health hazards, routes of entry, safety precautions, and first aid, and then only under the strict supervision of the instructor.

Disposal Procedures

Introduction

According to the EPA, a hazardous waste is a waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment." Hazardous waste also includes different physical forms such as: solids, liquids, and gases.

Hazardous Waste Disposal Vendor

Disposal of hazardous wastes in MT. SAC handled by third party vendor. Following criteria were used before choosing the appropriate vendor for disposal. Making sure the vendor has the following:

- Appropriate EPA licenses
- Appropriate State waste hauling licenses
- Certificates of insurance for General Liability, Environmental Liability, Completed Operations or Professional Liability, Auto, or Fleet coverage and Workers Compensation.
- Written assurance that you will receive disposal certificates, manifests, and bills of lading to ensure that disposal is properly completed.
- Company background, financial stability, and references

As a waste generator MT. SAC is responsible for the proper waste disposed. That is why it is extremely important to utilize a reputable disposal firm.

Waste Disposal Method:

- Waste containers must be labeled "Hazardous Waste" and lids must be attached except when adding waste.
- Follow disposal instructions as described in the Hazardous Waste Disposal Procedures of the Laboratory Safety Manual. Do not dispose of any chemicals down the sewer system, allowing it to evaporate, or placing it in the garbage without confirming proper interpretation of the manual with Occupational & Safety Programs.
- Prior to permanently leaving the laboratory, responsible parties must properly dispose of, return to storage, or sign over to the next person all chemicals prior to their departure.

Generator Id Number

MT. SAC has EPA ID to properly dispose various hazardous wastes generated at the academic areas and various construction projects throughout MT. SAC.