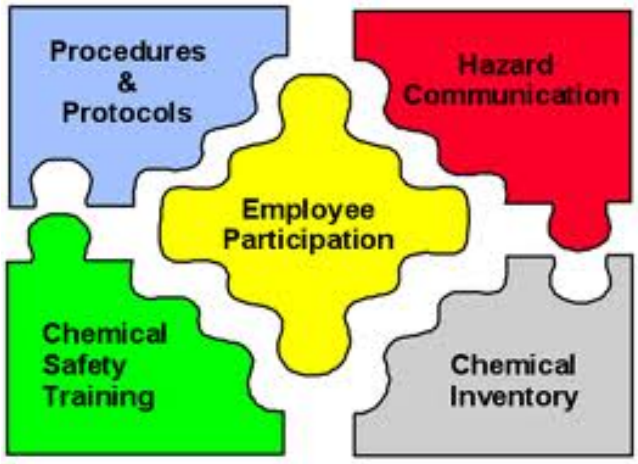
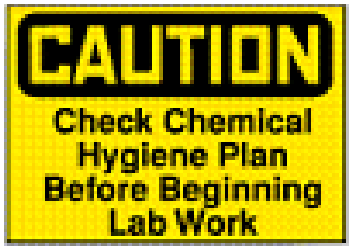
LODI UNIFIED SCHOOL DISTRICT

CHEMICAL HYGIENE PLAN

2014-15 rev. 4-10-15





EMERGENCY CONTACTS

Important phone nos. should be readily available in case of an emergency. The nos. may be set on speed dial for classroom, office or cell phones.

- Standard Emergency No. 911
- Ambulance Source: AMR 209-948-5136 Dispatch: 800-913-9113
- Animal Control: Lodi 333-6711 Stockton 937-8274
- Calif. Div. of Industrial Relations (Safety Concerns) Modesto 209-545-7310
- Chemical Disposal Contact: Ramos Environmental Waste Removal 800-456-7745
- City/San Joaquin County Health Dept.: 209-468-3411
- District Safety Office: 209-331-7193
- Fire Dept.: Lodi 333-6735 Stockton 464-4650
- Hospitals: Dameron (Stockton) 944-5550 Lodi Memorial 333-3411
- Calif. Poison Control System: Non-emergency 800-222-1222
- Police/Sheriff: Lodi 333-6727 Stockton 937-8377 Emergency: 209-937-7911
- School Health Service: 209-331-7075
- Toxic Substances Control Office: 800-728-6942

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Incident Action Plans A & B

INTRODUCTION

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.

Labs are unique since hazardous chemicals are used, stored, and/or handled. Due to the unique situation in laboratories, many health experts felt that Hazard Communication did not adequately cover occupational exposures to laboratory workers. Therefore, the "Occupational Exposure to Hazardous Chemicals in Labs" standard was enacted 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 Chemical Hygiene Plan will work in conjunction with Hazard Communication Program for all District employees engaged in the lab use of hazardous chemicals. The regulation shall apply only to those chemicals, which meet the definition of lab use (see Appendix B). Chemicals or hazardous substances, which do not meet the definition of lab use even if they are used in a laboratory, will be regulated under the Hazard Communication standard.

Based on the definitions of laboratory, lab use, and lab scale (see Appendix A) and as identified by Cal OSHA, Lodi Unified School District has identified the following under the Chemical Hygiene Plan: Classrooms

POLICY

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

Site 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 District lab occupants, with the following considerations:

- The Plan is designed to protect lab occupants from the health hazards associated with the hazardous chemicals in each lab.

- 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 District, departments, and instructors.
- The Plan enables the District to meet compliance with state, federal, and local regulations as regards to hazardous substances.

All District administrators, managers, employees, and laboratory occupants will be required to adhere to the policies and procedures set forth under this Plan. The District 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 District lab 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 the plan will be kept in the school site Administration and M&O.

PLAN REVIEW

The Chemical Hygiene Officer (CHO) will review the Plan within 12 months of implementation, then annually thereafter. The annual review will be conducted by the Chemical Hygiene Officer and proposed changes will be presented to the Safety Committee. The Plan review is to determine whether or not 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 Chemical Hygiene Officer is responsible for implementation of the Plan as described in this document. The District hereby assigns:

Director Maintenance & Operations - Chemical Hygiene Officer
Risk Management/Workers Comp Analyst

These appointments are effective 2013-14 and will continue until someone else is assigned these responsibilities.

The District offers its full support to the Chemical Hygiene Officer and pledges to provide Chemical Hygiene personnel with the time and resources necessary to fulfill their responsibilities.

The Chemical Hygiene Officer 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.

PLAN CONTENTS/REGULATORY REQUIREMENTS

Lodi Unified School District has developed a written Chemical Hygiene Plan to comply with regulations and as a tool to protect employees from health hazards associated with hazardous chemicals in the laboratory. The Districts plan is designed to keep exposures below permissible limits and to protect employees from health hazards associated with hazardous chemicals in the labs.

- 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, the District has implemented procedures to allow employees to seek medical consultations & medical examinations. These procedures can be found in Section V.
- The District will make available an information and training program to all lab employees. The goal

of this program is to ensure that all lab personnel are adequately informed about lab work, appraisal of the hazards of chemicals present in the lab, 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. Changes to the Chemical Hygiene Plan in the form of Safety Committee Minutes and the actual written Chemical Hygiene Plan
2. Health and safety training for employees working in the lab. These records will be kept in the science chair office
3. Annual general lab safety inspections will be kept in the Risk Management Office.
4. Monthly testing of the emergency eyewashes and showers will be maintained at each lab.
5. Annual fume hood surveys (additional surveys may be conducted on a more frequent basis as directed by the Chemical Hygiene Officer) will be maintained at the science chair office and/or equipment.

These records will be maintained for at least five years.

INSPECTIONS

Risk Management will conduct bi-annually inspections of all science classrooms/labs. The results of these inspections will be provided to the school site science department chair. Risk Management will review corrective actions status during the next quarterly inspection. Except those that require immediate attention.

Lodi Unified School District has implemented the following inspections based on regulatory requirements. Below is a list of the required inspections and frequencies:

1. Emergency Eyewash and Deluge Shower testing/activation will be performed monthly to ensure proper operation. CCR Title 8; Section 5162 (e) Action by: Science Instructor

2. Fume Hood ventilation rate surveys will be conducted at least annually.
   CCR Title 8; Section 5143 (a) (5). Action by: Risk Management

3. General laboratory safety/housekeeping inspections will be performed annually. Action by: Risk Management

4. Inspections of personal protective equipment will be conducted on a regular basis. Action by: Science Instructor

SAFETY IN THE CHEMISTRY LAB

SCIENCE DEPARTMENT CHAIR RESPONSIBILITIES

Insure that lab supervisor, who has overall responsibility for chemical hygiene in the lab including responsibility to:

1) Ensure that workers know and follow the chemical hygiene rules, that protective equipment is available and in working order, and that appropriate training has been provided.

2) Provide regular, formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment.

3) Know the current legal requirements concerning regulated substances.

4) Determine the required levels of protective apparel and equipment.

5) Ensure that facilities and training for use of any material being ordered are adequate.

6) Notify Risk Management of any unsafe or non-compliant conditions and/or activities as reported by lab measure, instructors or students.

7) The Science Department Chair will inspect local and general ventilation systems to ensure it is in properly worker order. Request Maintenance & Operations (M&O), if it is not working properly.

SCIENCE TEACHER'S RESPONSIBILITIES

One of the most important first steps is to be familiar with each experiment protocol, including how to use all the equipment, the identity and hazards of all chemicals used, and procedures to prevent and recover from accidents. Once you have this information, the next step is to promote a culture of safety in the chemistry classroom. Lead by example by wearing appropriate personal protective equipment.

The following checklist may be helpful in establishing a safe chemistry laboratory:

Upkeep of Lab and Equipment

1. Regularly inspect safety stations and first aid equipment. Replace used items and make any needed repairs. (for safety shower and eyewash stations, see chapter 5, "Additional Safety Practices.")

2 Notify the administration of any hazardous condition (e.g., malfunctioning safety equipment).

3. Never use defective equipment

Recordkeeping

1. Maintain a log of staff safety and hazardous materials training as required by school administration.

2. Keep records of all laboratory incidents for as long as required by school administration or law.

Safety and Emergency Procedures

1. Educate students on the location and use of all safety and emergency equipment prior to any laboratory activity.

2. Know what steps to take in the event of a spill.

3. Provide students with written safety procedures and orally review what to do in an emergency.

4. Keep a list of emergency phone nos. in a visible location.

5. Conduct appropriate safety and evacuation drills regularly.

6. Explain in detail the consequences of violating safety rules and procedures.

Maintenance of Chemicals

1. Regularly inspect chemicals and other supplies. Annually update the chemical inventory and discard any leaking, damaged, empty or unlabeled containers according to protocol.

2. Maintain a copy of the chemical inventory for local emergency responders.

3. Do not allow any **food, drink, or personal care products** in the chemistry classroom at any time.

4. Ensure that chemicals not currently in use are properly segregated and stored. Maintain limited access to chemical storage areas and be sure to display the proper placard and warning signage.

5. Know the storage, handling, and safety requirements for each chemical used.

6. Properly dispose al all chemicals and chemical waste. Consult the label the SDS for disposal information and always follow appropriate chemical disposal regulations.

Note

1) Before starting any laboratory activity, weigh the potential risks versus the educational

value of the exercise.

2) If possible, consider replacing chemicals with less-hazardous substances, or conduct a safer experiment that can demonstrate the same learning objectives.

Student's Responsibilities

Working with chemicals can be dangerous if important safety steps are not followed.

Each school year should begin with an orientation and demonstration of safety equipment and a review of expected laboratory conduct. Each experiment should begin with specific guidance, including information about the chemicals used and any required or special handling. The following checklists may acquaint students with the conduct expected in the chemistry lab.

Student Lab Conduct

1) Rowdy conduct and practical jokes are not allowed

2 Cell phones and music or video equipment is prohibited

3) Unauthorized experiments are strictly forbidden: all lab work must be supervised

4) Do not sit on lab benches

5) Immediately report any spills, accidents, or injuries to a teacher

6) Never leave experiments that are in progress, especially lit Bunsen burners or open gas valves.

7) Never threaten another student with a chemical

8) Make sure no flammable solvents are around when lighting a flame.

9) Leave all equipment, chemicals, and experiment products in the lab unless authorized by the teacher.

10) Coats, bags and other personal items should never be present in the lab.

Student Safety Practices

1) Wear proper safety equipment as instructed by the teacher (e.g., goggles, gloves, lab coat or apron, and the like).

2) Always remove gloves and wash hands before handling any personal item or before leaving the lab. Do not touch doorknobs, handles, water fountains, water faucets, or any thing else that might expose someone to the chemicals on gloves.

3) Wear closed-toe and closed-heel shoes

4) Wear clothing that covers the legs, arms torso, remove any loose clothing and jewelry and tie back long hair.

5) Keep gloved hands away from skin, eyes and mouth while using chemicals. Never eat, drink apply makeup or chew gum in the lab.

6) Never taste, smell or touch any chemicals unless specifically approved by the teacher.

Emergency Procedures

1) Know where the emergency exits are located and where to go if the classroom building is evacuated.

2) Ask the teacher to demonstrate how to use the fire extinguishers, fire alarms, eyewash stations and emergency showers and first-aid kits.

SECTION I

STANDARD OPERATING PROCEDURES (SOP)

WORKING WITH LAB CHEMICALS

Storage and use of hazardous substances are necessary for the continued operation of any school lab. Hazardous materials are generally necessary for their educational value in science labs. Since hazardous substances are necessary to operate a lab, it is important that the users of these substances practice safe storage, handling, and use procedures to ensure the loss potential is minimized.

Injury or illness to employees, students, or visitors, damage to District owned or leased properties, 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:

Minimize Exposure

- It is prudent to minimize all chemical exposures. Because few lab 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.

- 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.

Reduce Risk

- 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.

Labeling

- 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.

Safety Data Sheets (SDS)

- 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.

- 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.

Route of Entry

- 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

- 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.

- 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.

Personal Protective Equipment (PPE)

- Personal protective equipment includes such items as respiratory protective equipment, eye goggles, face shields, gloves, aprons, and boots. 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.

Chemical Hygiene Plan

- Institute a Chemical Hygiene Plan. A mandatory Chemical Hygiene Plan designed 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.

Hazardous Waste Disposal

- **Disposal of hazardous waste is a major concern for all laboratories.** The goal of the Plan is to ensure minimal harm to lab 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.

Handwashing

- Always wash hands after handling animals, animal food, their habitat and chemicals.

Lesson Plan Development

Safety Guideline / Posting

- Safe handling procedures must be posted in all instructional areas.

Chemical Spills – see Appendix H & I

Before the Lab Experiment

1) Perform regular inspections. By regularly inspecting all containers, you can quickly replace those that are cracked or broken and thereby prevent spills and leaks.

2) Pre-weigh materials. After students master the skill of using the balance to weigh substances, it may be practical to pre-weigh materials for them. Students' lab productivity can be increased by reducing the time spent waiting for each student to weigh his or her materials. Pre-weighing chemicals also helps to prevent the contamination of substances, a problem that becomes more likely when many people obtain samples from the same bottle. Trained and properly supervised lab assistants who have reviewed the pertinent SDS for each hazardous substance to be handled may perform the pre-weighing tasks.

3) Use less-hazardous chemicals. Substituting less-hazardous chemicals for chemicals that present health and environmental risks can reduce the use of more harmful chemicals.

4) Reduce the use of metal-bearing waste. Experiments that generate metal-bearing waste can be expensive because of the high cost of the processing treatments for heavy metals. Any commingling of less-hazardous waste with heavy metals causes the entire mixture to be classified as a heavy-metal waste and greatly increases the cost of disposal.

5) Experiments that generate heavy metals should be carefully monitored so that waste streams are not mixed. If nonmetallic reagents are substituted for those containing metals, lower disposal costs are likely, which is a boon for the district.

During the Lab Experiment

1) Use efficient dispensers. Using containers that dispense the contents through pumps and spigots will reduce the likelihood of spills and measurement errors.

2) Reduce wet chemistry. In some circumstances, the use of instrument methods instead of wet-chemistry procedures will help in reducing waste because instrument analysis requires much small quantities of chemicals.

3) Avoid waste generation. Sometime chemicals can be rendered safe enough to go into the sewer in the final steps of an experiment. In that case, the process will not only reduce the need for off-site disposal but also increase students' awareness of proper waste management and waste reduction.

4) Conduct scaled-down experiments. The volume of chemicals in experiment can be reduced by practicing micro-scale chemistry (described in the following subsection).

After the Lab Experiment

1) Recycle products used in experiments. Recycling chemicals by using the product of one experiment in the student's next experiment is an effective way to greatly diminish the amounts of fresh chemicals used in the lab. An entire college-level lab curriculum that focuses on using cyclic experiments is presented in the "No-Waste Lab Manual for Educational Institutions: A Procedure that Eliminates Toxic Waste Production from Introduction Chemistry Laboratory Courses. This manual can be download at: **http://infohouse.p2ric.org/ref/01565.pdf** (outside source accessed Feb. 2012). Calif. Dept. of Health Services, 1989.

2) Clean containers according to state regulations. Costly disposal fees may be reduced by thoroughly emptying all used chemical containers. The CCR, Title 22, Section 66261.7, addresses the handling of contaminated containers. It encourages recycling and other options for disposal of "empty" containers. Container once filled with hazardous waste can be disposed of as nonhazardous waste provided certain stipulations are met.

3) Reuse solvents. Use spent solvents for the initial cleaning of glassware; use fresh solvent only for the final rinsing.

Waste reduction through microscale chemistry. One of the most effective ways in which waste reduction can be achieved is by using smaller volumes of chemicals to perform microscale lab experiments. In most microscale experiments, the chemical quantities can be reduced to between one-tenth and one-thousandth of the usual scale. The main advantages included the following: (1) less money is spent on chemicals (2) less waste is produced (3) exposure to hazardous chemicals is reduced (4) reduction in the volume of reagents for environmental and safety reasons can be modeled to students (5) the results of the experiment can often be determined more quickly.

The transformation of a laboratory from macroscale to microscale is easily accomplished. Some new materials must be purchased but are relatively inexpensive. One cost-effective way of converting is to purchase reusable plastic or polystyrene tissue-culture plates and plastic pipettes.

Because water is the solvent used most often in high school experiments, the chemical stability of the plastic is not usually a problem. If plastic is unsuitable for organic chemistry, microscale glassware can be substituted, although it is slightly more expensive. Nearly all chemical suppliers now carry the equipment necessary for microscale experiments.

SECTION II

CRITERIA TO BE USED FOR IMPLEMENTATION OF MEASURES TO REDUCE EXPOSURES

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

ENGINEERING CONTROLS

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

- General ventilation
- Local ventilation

    1) Fume hoods

- Segregation

    1) Segregating the chemicals from the user through the implementation of fume hoods and glove boxes.

    2) Segregation of incompatible chemicals in a well-identified area with local exhaust ventilation.

Ventilation

Ventilation is provided for two basic considerations: 1) for the comfort of the building occupants; and 2) for health and safety considerations for those working in labs, 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:

- Corrosion resistance.
- Easily decontaminated.
- The ability to safely handle flammable materials.

Each hood installation should be configured by a ventilation engineer, especially with regard 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. These hoods will be inspected quarterly by the science instructor.

Fume hoods are not intended primarily for the storage of chemicals; therefore, material storage in hoods are 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 Chemical Hygiene Officer. 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.

The Lab Instructor 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, M&O will be notified and a Work Order generated and submitted. Appropriate corrective action will be taken. Items specific to the operation of the Fume Hoods can be found in the Lab Safety Checklist in Appendix E. These checklists will be kept on file for at least 5 years for recordkeeping purposes.

Ventilation Maintenance

Local and general ventilation systems supplying labs will be on a preventive maintenance plan to ensure continued proper operation. The Science Chair will review ventilation operation and preventative maintenance as appropriate.

PERSONAL PROTECTIVE APPAREL AND EQUIPMENT

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

Safety and emergency equipment is available and maintained in good operating condition in all labs. All lab 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 labs:

- **Phones:** Phones for emergency use are readily available to lab personnel. Emergency phone numbers should be clearly identified.

- **Fire Alarms:** At a minimum, manual fire alarms should be located at or near each lab. Consideration should be given to installing automatic fire detection and alarm systems. The alarms should have both local and remote stations.

- **Fire Extinguishers:** Each chemical lab are 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 are recharged and certified at least annually, with monthly inspections between annual recharging.

- **Fire Blankets:** Fire blankets are available primarily as first aid for the prevention of shock. Fire blankets are used only as a last resort to extinguish clothing fires, as the blankets tend to hold heat in and may increase the severity of burns.

- **Deluge or Quick Drench Showers:** Showers are installed in or near labs, chemical preparation, or chemical storage areas, especially if corrosives or toxics are handled. Safety showers are tested at periodic, regular intervals. All lab personnel are trained in the proper use of the shower.

- **Eyewash Stations:** Each chemical lab and preparation area is installed with an eyewash station. The station provides at least 15 minutes of aerated water flow.

- **Miscellaneous emergency equipment:**

    - Spill clean-up stations

    - Eye protection equipment storage cabinets

Inspection of Emergency Eyewash Stations/Deluge Showers

All emergency eyewash stations and deluge showers will be inspected monthly by the Science Instructor to ensure the units function properly and perform adequately. The inspection tags on each of the units will be marked with the initials of the inspector and the date inspected.

BASIC PERSONAL PROTECTIVE EQUIPMENT

In addition to safety and emergency equipment, certain personal protective equipment is available for all lab personnel. All lab personnel who may use protective equipment are trained in its proper use and the equipment will be inspected regularly by the Science Instructor. 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.
  - **Lab Coats.** Lab coats do not significantly resist penetration by organic liquids. However, the coats do provide protection to clothing from dirt and minor chemical splashes.
  - **Aprons.** Plastic or rubber aprons provide good protection from corrosive liquids, but may complicate injuries in the event of fire. Plastic aprons can accumulate a charge of static electricity; therefore, plastic aprons should be avoided when handling flammables.

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.
- Work with chemicals should only be done in well-ventilated areas.
- Promptly flush any area of the skin, which has become contaminated with any lab chemical.
- **Do NOT smell or taste any lab chemical.**
- Inspect all personal protective equipment (such as gloves, goggles, and respirators) before use.
- Do NOT release chemicals into the atmospheres of rooms supplied by recirculated air.
- **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. Do not store food products in same area as chemicals or lab animals.
- **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 lab personnel. Following are minimum guidelines for these functions.

- Floors in labs, stockrooms, preparation rooms, and storerooms should be cleaned regularly (at least daily in labs 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 found to no longer be needed should be removed and properly disposed.

- Access to utility controls and emergency equipment should be kept free and clear at all times.

Housekeeping Inspections

Formal housekeeping and chemical hygiene inspections will be conducted at least annually by the Science Instructor. The inspection checklists provided in Appendix E 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 maintained on site by the Science Department Chair.

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 lab 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.
    - The Districts 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
    - Radioactives
    - 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

Labs may be subject to a number of emergencies including chemical spills, fire, explosion, personnel contamination, broken glass, and loss of critical utility services.

See Incident Action Plans A & B – Appendix H & I

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 lab 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. Labs 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 closed containers and label container**
- 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 form 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 rubber aprons in addition to the 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

REACTIVES

- Storage should only be in cool, dry, well-ventilated areas.
- Reactives 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).
- Phosphorous should only be stored in containers with the substance completely covered with water.

ORGANIC PEROXIDES

Organic peroxides have unusual stability problems, which make them among the most hazardous substances handled in labs. 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 labs include Diisopropyl Ether, Ethyl Ether, Tetrahydrofuran, Tetrahydronaphthalene, Cyclohexene, P-Dioxane, and Dicahydronaphthalene.

Preventive measures for peroxides include:

- Quantities of peroxides should be limited to the minimum required.
- 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 lab 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".
- 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.

<u>Note</u>: Only trained and qualified emergency response personnel are authorized to use a Hydrogen Cyanide Gas (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 people should be present at all times.

SUBSTANCES OF KNOWN HIGH CHRONIC TOXICITY

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

- Experimental work and disposal procedures for waste should be approved by the lab supervisor.

- 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 lab, portion of a lab, 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.

- Lab 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 lab 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 CHO 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 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.
- Preferably, all substances should be received in a central location.
- 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 the District.
- 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 shall be followed when purchasing chemicals:

- Chemical requests by Faculty are submitted to the Science Department Chair..

- Science Department Chair reviews the Safety Data Sheet (SDS) and the hazards associated with the product.

- If the product is deemed a significant hazard, the Science Department Chair takes the request to the Faculty member making the request to discuss the educational value in relation to the hazard.

SECTION V

MEDICAL CONSULTATION & MEDICAL EXAMINATIONS

The District is implementing a Chemical Hygiene Plan, which is designed to keep exposures below permissible exposure limits and to protect lab employees from health hazards associated with the hazardous chemicals stored, used, or handled in any District lab.

Although precautions and procedures are designed to protect employees, the District realizes there may be times when medical attention would be appropriate for lab employees working with hazardous chemicals. To ensure employees have an adequate opportunity to receive medical attention, including medical consultation and/or medical examinations, the District will implement the following:

- The District will provide an opportunity to any lab employee to receive an appropriate medical examination, whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the lab.

- The District will implement medical surveillance as designated by Cal-OSHA standards for regulated substances, when exposure monitoring reveals exposure levels above the action level (or exposure limit when no action level is stipulated), for any Cal-OSHA regulated substance having exposure monitoring or medical surveillance requirements.

- The District will provide an opportunity to any lab employee for medical consultation as a means of determining the need for a medical examination, whenever an event (such as a spill or leak) occurs in a lab that results in a strong possibility of a hazardous exposure.

If medical examinations or medical consultations are required, the District will ensure the following conditions:

- They are performed by or under the supervision of a licensed physician.

- They are provided at no cost to the employee.

- They are provided at a reasonable time and place without loss of pay to the employee.

The District will take reasonable and appropriate action to obtain and provide the physician with information regarding the exposure. At a minimum, the District will provide the following information:

- The identity of the hazardous chemicals causing the exposure.

- A description of the conditions under which the exposure occurred.

- Quantitative exposure data, if available.

- A description of any signs or symptoms of exposure that the employee may have experienced.

The District will obtain a physician's written opinion from the examining or consulting physician for any medical examinations or consultation provided under this Plan. The physician shall be notified that the written opinion is not to reveal any findings or diagnoses unrelated to occupational exposure. However, the opinion shall include the following:

- Any recommendations for further medical follow-up.
- The results of the examination and associated tests, if requested.
- Disclosure of any medical condition revealed by the examination, which may place the employee at increased risk if exposed to a hazardous chemical in the lab.
- A statement that the employee has been informed by the physician of the results of the examination or consultation.
- A statement that the employee has been informed by the physician of any medical condition which may require further treatment.

SECTION VI

EMPLOYEE INFORMATION & TRAINING

GOAL

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

FREQUENCY

The District 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 lab 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 Lab Instructor will provide information on the job specific hazards and work practices in the lab.

CONTENT

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

Information employees will be informed of:

- The location and availability of the Chemical Hygiene Plan.
- 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 lab 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 lab work areas.

- ♦ Measures which can be taken to protect oneself from health and physical hazards.

- ♦ The applicable details of the District's written Chemical Hygiene Plan.

TRAINING AND INFORMATION

Each employee who works with or is potentially exposed to hazardous chemicals will receive initial training on the Hazard Communication Standard and the safe use of those hazardous chemicals.

The Site Administrator or their designate, such as Keenan Associates, conducts hazardous chemical training. Additional training will be provided for employees whenever a new hazard is introduced into their work areas. The training will emphasize these elements:

- A summary of the standard and this written program.

- A discussion of all operations in the employees' workplace where hazardous substances are present.

- The location and availability of the written Hazard Communication Program, which will include a list of hazardous substances.

- Methods and observations that may be used top detect the presence or release of hazardous substances in the work area.

- The physical and health hazards of substances in the work area, and the measures to take to protect employees from those hazards, emphasizing appropriate work practices, emergency procedures and personal protective equipment to be used.

- An explanation of the labeling system used, GHS Pictograms, the Safety Data Sheet, and how employees can obtain and use the appropriate hazard information

- The procedures for conducting non-routine tasks involving hazardous materials.

- Employees shall also be informed of their right:

1. To personally receive information regarding hazardous materials to which they may be exposed
2. For their physician or collective bargaining agent to receive information regarding hazardous substances to which they may be exposed.
3. Against discharge or other discrimination due to the employee's exercise of the rights afforded pursuant to the provisions of the **Hazardous Substance Information and Training Act.**

TRAINING

The site administrator, designee or site Haz Com coordinator will ensure that all staff are provided specific training on all chemicals that they utilize in the workplace.

Site administrator, designee or site Haz Com coordinator will provide access to Keenan Safe School Training Library. They will ensure during the first 12 months of employment that the following courses have been satisfactorily completed:

1) Hazard Communication – Right to Know
2) Hazard Communication – Right to Understand
3) Safety Data Sheets (SDS)
4) Chemical Spills Overview

Site administrator, designee or site Haz Com coordinator will maintain a listing of all employees trained on the Haz Com related materials.

Training must also include details of their specific Hazard Communication Program (such as location of the SDS file and any in-house procedures).

The Haz Com coordinator monitors employee training.

CONTAINERS

Site administrator, designee or site Haz Com coordinator will ensure that all HM containers are in good condition and closed when not in use.

CONTRACTOR EMPLOYERS

The Hazard Communication Program Coordinator will advise outside contractors of any chemical hazards which may be encountered in the normal course of their work at the District facilities and will provide copies of Safety Data Sheets if necessary.

Additionally, the Coordinator will give precautions so that employees may take to lessen the possibility of exposure by using appropriate protective measures.

DEFINITIONS APPENDIX A

Action level. A concentration designated in Title 8, California Code of Regulations for a specific substance, calculated as an eight (8)-hour time weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.

Carcinogen (see "select carcinogen").

Chemical Hygiene Officer. 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 employer's organizational structure.

Chemical Hygiene Plan. A written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment and work practices that:

(1) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular work place

(2) meets the requirements of subsection 5191(e).

Chief. The Chief of the Division of Occupational Safety and Health.

Combustible liquid. Any liquid having a flashpoint at or above 100° F (37.8° C), but below 200° F (93.3° C) except any mixture having components with flashpoints of 200° F (93.3° C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

Compressed gas.
(1) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70° F (21.1° C); or

(2) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130° F (54.4° C) regardless of the pressure at 70° F (21.1° C); or

(3) A liquid having a vapor pressure exceeding 40 psi at 100° F (37.8° C) as determined by ASTM D-323-72.

Designated area. An area which may be used for work with "select carcinogens," reproductive toxins or substances which have a high degree of acute toxicity. A designated area may be the entire lab, an area of a lab or a device such as a lab hood.

Emergency. Any 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.

Employee. An individual employed in a lab workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

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

Flammable. A chemical that falls into one of the following categories:

(1) "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;

(2) "Gas, flammable" means:

(A) 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

(B) 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.

(3) "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.

(4) "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 to be 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.

Flashpoint. The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(1) Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24 - 1979 (ASTM D 56-79) - for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100° F (37.8° C), or that do not contain suspended solids, and do not have a tendency to form a surface film under test; or

(2) Pensky-Martens Closed Tester (see American National Standard Method of Test for Flash Point by Pensky-Martens closed tester), Z11.7 - 1979 (ASTM D 93-79) for liquids with a viscosity equal to or greater than 45 SUS at 100° F (37.8°C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(3) Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)). Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above. Hazardous chemical. A chemical for which there is statistically significant evidence based on at least one

study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes.

Laboratory. A facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.
Laboratory scale. Work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safety manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.

Laboratory-type hood. A device located in a laboratory, enclosed on five 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 allows chemical manipulations to be conducted in the enclosure without insertion of any portion of the employee's body other than hands and arms. Walk-in hoods with adjustable sashes meet the above definition provided that the sashes are adjusted during use so that the airflow and the exhaust of air contaminants are not compromised and employees do not work inside the enclosure during the release of airborne hazardous chemicals.

Laboratory use of hazardous chemicals. Handling or use of such chemicals in which all of the following conditions are met:

(1) Chemical manipulations are carried out on a "laboratory scale";

(2) Multiple chemical procedures or chemicals are used;

(3) The procedures involved are not part of a production process, nor in any way simulate a production process; and

(4) "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 an employee and a licensed physician for the purpose 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.

Organic peroxide. An organic compound that contains the bivalent -o-o- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

Oxidizer. A chemical other than a blasting agent or explosive as defined in Section 5237(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

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, unstable (reactive) or water-reactive.

Protective laboratory practices and equipment. Those lab procedures, practices and equipment accepted by lab health and safety experts as effective, or that the employer can show to be effective, in minimizing the potential for employee exposure to hazardous chemicals.

Reproductive toxins. Chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

Select carcinogen. Any substance which meets one of the following criteria:

(1) It is regulated by Cal/OSHA as a carcinogen; or

(2) It is listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (1985 edition); or

(3) It is listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on Cancer Monographs (IARC) (Volumes 1-48 and Supplements 1-8); or

(4) It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:

(A) After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m3;

(B) After repeated skin application of less than 300 mg/kg of body weight per week; or

(C) After oral dosages of less than 50 mg/kg of body weight per day.

Unstable (reactive). A chemical which is the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

Water-reactive. A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

CHEMICAL HYGIENE RESPONSIBILITIES APPENDIX B

Responsibility for chemical hygiene rests at all levels including the:

1. Chemical Hygiene Officer, who has ultimate responsibility for chemical hygiene within the institution and must, with other administrators, provide continuing support for institutional chemical hygiene.

2. Department Chair who is responsible for chemical hygiene in that unit and monitoring procurement of chemicals through assistance of the Chemical Hygiene Officer.

3. Chemical Hygiene Officer, whose appointment is essential and 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. Science Instructor
   a. Ensure that workers know and follow the chemical hygiene rules, that 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 Chemical Hygiene Officer).
   d. Know the current legal requirements concerning regulated substances;
   e. Determine the required levels of protective apparel and equipment; and
   f. Ensure that facilities and training for use of any materials being ordered are adequate.

5. Science 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. M&O
   a. Perform repairs on the emergency equipment and ventilation systems in the laboratories as reported or as needed.

BASIC LABORATORY SAFETY RULES APPENDIX C

The Chemical Hygiene Plan requires that lab personnel know and follow basic rules and procedures for working with chemicals. The basic rules and procedures lay the foundation for lab 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 lab 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, BEVERAGES, ETC.

- Avoid eating, drinking, gum chewing, or application of cosmetics in areas where lab 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 lab operations.

EQUIPMENT & GLASSWARE

- Handle and store lab 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 lab

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 lab 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 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 lab ventilator will be maintained when it is "OFF".

VIGILANCE

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

WASTE DISPOSAL

- Ensure that the plan for each lab operation includes plans and training for waste disposal.
- Deposit chemical waste in appropriately labeled receptacles and follow all other waste disposal procedures of the Chemical Hygiene Plan.
- 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 waste water 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 lab 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 Research 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 of all incidents of exposure or spills. Consult a qualified physician when appropriate.

SCIENCE SAFETY INSPECTION CHECKLIST APPENDIX D

Building: _____Department: _____Date: _____

Inspector: _____Room: _____

Job Title: _____ Phone: _____

HEALTH AND SAFETY MANAGEMENT

Yes	No	N/A		
o	o	o	1.	Is there a Chemical Hygiene Program present?
o	o	o	2.	Are personnel trained in chemical health/physical hazards and lab safety?
o	o	o	3.	Do lab personnel have access to and are familiar with the use of Safety Data Sheets (SDSs)?
o	o	o	4.	Have personnel using biohazards, toxins, and regulated carcinogens been given documented special training?
o	o	o	5.	Are personnel instructed in emergency procedures (exits, location, and use of fire extinguishers, medical)?
o	o	o	6.	Have personnel been instructed on how to respond in the event of a chemical spill?
o	o	o	7.	Are complete training records and documents available for review by the Personnel Office and outside agencies?
o	o	o	8.	Have all hazards identified by the annual survey been abated? (Action records must be retained.)
o	o	o	9.	Do laboratory personnel perform semi-annual lab inspections? (PI must retain records.)

GENERAL SAFETY

o	o	o	10.	Are rooms and cabinets containing regulated carcinogens, biohazards, and radioactive materials labeled?
o	o	o	11.	Are work areas clean and uncluttered?
o	o	o	12.	Do employees know the location of the first aid kit and is it accessible?

Yes	No	N/A		
o	o	o	13.	Is equipment greater than 5 feet tall seismically secured to prevent tipping during an earthquake?
o	o	o	14.	Do shelves have lips, wires, or other seismic restraints to prevent items from falling?
o	o	o	15.	Are food and beverages kept away from work areas and out of lab refrigerators or cabinets?
o	o	o	16.	Are fire extinguishers accessible and charged? (If not, please call Physical Plant Services.)
o	o	o	17.	Are sinks labeled, "Industrial Water – Do Not Drink"?
o	o	o	18.	Have personnel been instructed on the hazards of wearing contact lenses in the laboratory?
o	o	o	19.	Are protective gloves available and worn for lab procedures where skin absorption/irritation may occur?
o	o	o	20.	Are safety glasses or other eye protection available and worn in the lab?

COMMENTS

Biosafety Cabinet: Date last inspected?

Types of regulated carcinogens

Types and quantity of compressed gasses

Gallons of flammable liquids

Types of personnel protective equipment

LAB EQUIPMENT

o	o	o	21.	Have chemical fume hoods been tested within the past year?
o	o	o	22.	Is storage in hoods kept to a minimum and is it placed so it does not impede proper airflow?
o	o	o	23.	Does fume hood draw air (test with a tissue on hood edge) and is alarm installed and working?
o	o	o	24.	Is the lab ventilation negative with respect to corridors and offices?

o	o	o	25. Are rotating or moveable parts and belts guarded with screens having less than ¼ inch opening?
o	o	o	26. Are refrigerators and freezers, which are used for storage of flammables, spark proof and properly labeled?
o	o	o	27. Are non-spark proof refrigerators labeled as "Unsafe for Flammable Storage"?
o	o	o	28. Are all gas cylinders restrained to prevent tipping or falling?
o	o	o	29. Are valves of gas cylinders capped when not in use?

HAZARDOUS MATERIALS

o	o	o	30. Are chemicals labeled to identify contents and hazards?
o	o	o	31. Are regulated carcinogens handled safely to reduce employee exposure?
o	o	o	32. Are chemicals separated by hazard class and stored to prevent spills (acids, bases, oxidizers, flammables, etc.)?
o	o	o	33. Are chemicals inventoried (chemical name, quantity on hand, amount used per year)?
o	o	o	34. Are chemical wastes properly segregated and stored with Waste Pick-up Tags attached to the containers?
o	o	o	35. Are all hazardous wastes disposed of and not poured into the sewer system?
o	o	o	36. Is a plumbed emergency eyewash station available within 100 feet of all areas where chemicals may splash onto an employee's body?
o	o	o	37. Is a plumbed emergency eyewash station available within 100 feet of all areas where chemicals may splash or mechanical hazards such as grinding?
o	o	o	38. Are either and other peroxide formers dated?
o	o	o	39. Are sharps stored in puncture-proof containers and labeled appropriately (infectious waste or hazardous waste)?

FIRE AND ELECTRICAL SAFETY

Yes	**No**	**N/A**	
o	o	o	40. Are fire doors unobstructed and readily closeable?
o	o	o	41. If greater than 10 gallons of flammables are stored, is an approved flammable storage cabinet used?

o	o	o	42. Are flammable liquids stored in less than 1-gallon quantity or kept in less than 2-gallon safety cans?
o	o	o	43. Are flammable liquids limited to 60 gallons per fire area?
o	o	o	44. Are plugs, cords, and receptacles in good condition (no splices or frayed cords)?
o	o	o	45. Is all equipment properly grounded?
o	o	o	46. Are extension cords used? (These are not to be used in place of permanent wiring, running through walls, ceilings, doors, etc.)
o	o	o	47. Are all electrical boxes, panels, receptacles, and fittings covered to protect against electrical shock?
o	o	o	48. Are control switches, circuit breakers, electrical panels, and emergency power cabinets free of obstructions?
o	o	o	49. Are circuit breakers labeled to indicate what equipment is served by each?
o	o	o	50. Have all outlet adapters been removed? (Install additional outlets or use fused power strips if current demand is within the strip's rating.)

EYE WASH/DELUGE SHOWER

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

COMMON LAB CHEMICALS STORAGE CONDITIONS APPENDIX E

INTRODUCTION

Storage and use of hazardous substances are necessary for the continued operation of any school District. 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 District 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 District 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 (SDSs)

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. The ventilation requirements will be detailed on the data sheet and may also be listed on the container label. 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 Material Safety Data Sheets. In addition, there are reference sources that can provide general safety precautions for storage and use of both specific chemicals and general categories of hazardous materials. Some of these sources are:

Prudent Practices for Handling Hazardous Chemicals in Laboratories
National Academy Press, Washington, D.C.

Hazardous Waste Management at Educational Institutions
National Association of College & University Business Officers
Washington, D.C.

Flammable, Corrosive and Toxic substances constitute a large portion of the hazardous materials commonly found in school District 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 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.
- 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 GUIDELINES APPENDIX F

INTRODUCTION

Disposal of Hazardous Waste is a major concern of any entity that purchases and uses hazardous substances. As these substances are used, waste is generated and must be removed for proper disposal. The two major concerns of hazardous waste generators are the cost of such disposal and governmental regulations pertaining to proper disposal. If you have been involved in waste disposal in the past, you already have a feel for the high costs and tedious procedures involved.

All disposal activities must be coordinated through the Chemical Hygiene Officer.

SELF DISPOSAL

To help mitigate the costs involved with hazardous waste disposal, the user should be aware that many chemicals can be self-disposed. Information on which chemicals can be self-disposed can be obtained from the chemical manufacturers, Safety Data Sheets, and several other publications.

You should look at the overall cost of using chemicals from the "cradle to the grave", not just the purchase cost.

If a supplier is willing to provide you with self-disposal guidelines, smaller containers, SDS's, properly labeled containers and other help, you should consider this as a means of reducing your overall cost, even if the purchase cost is greater.

Although self-disposal may reduce your disposal cost, it may increase your exposures to Environmental Liability, General Liability, Workers Compensation, and Property Damage. Top management and administrators should carefully weigh the advantages and disadvantages before committing to a self-disposal program.

After the pros and cons of self-disposal have been thoroughly reviewed and a decision to implement self-disposal is made, then the following conditions are essential for safe and effective disposal:

- Disposal of small amounts only.
- Provide adequate training to persons involved in such disposal, placing emphasis on proper procedures and on methods of protecting the workers and property.
- Provide proper personal protective equipment for persons involved in the disposal. Ensure that the individuals are trained in the use of the protective equipment and enforce the use of such equipment.
- Provide all appropriate emergency equipment such as eye wash stations, deluge showers, spill kits and proper fire extinguishers.
- Ensure that disposal areas have adequate ventilation including, where necessary, local removal ventilation such as a fume hood.

- Enforce all Federal, State and local regulations regarding disposal of hazardous materials.

USE OF DISPOSAL SPECIALISTS

If the decision is to not self-dispose, but to use a disposal specialist, there are numerous considerations besides costs that must be reviewed. There are many waste disposal companies to choose from and you should interview at least three before making any decisions if this is your first time using a disposal company. If you have been using a disposal company on an on-going basis, you should periodically audit the services provided. For either a first time user or for an audit or an on-going user some things to check for are:

- 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

To obtain a quote from a disposal specialist, the specialist will need to know:

- what chemicals are to be disposed
- the number, size and type of containers in which the chemicals are stored.
- the number and size of containers having unknown substances.

Remember that you as the waste generator are responsible for the waste disposed. That is why it is extremely important to utilize a reputable disposal firm. Should you have any questions regarding disposal firms or desire any recommendations please contact the Risk Management Division of Keenan & Associates.

GENERATOR ID NUMBER

Before hazardous waste can be disposed, a Generator Identification number must be obtained. To obtain this number contact the State Department of Health Services or the Environmental Protection Agency.

SPILLS IN THE SCHOOL
&
HAZARDOUS MATERIALS RELEASE

A hazardous material is any substance chemical, biological, radiological, or explosive in a quantity or form, which may be harmful to humans, domestic animals, wildlife, economic crops or property when released or spilled into the environment. Hazardous materials accidents may occur as the result of human error or natural disaster.

A number of approved materials, products and chemicals may be found in and around schools. Use may occur in classrooms and labs, school custodial work and supply areas, kitchen work and supply areas, outdoor areas, and office areas.

Release or spills involving hazardous materials are likely to happen without warning and pose a risk to people who may come in contact with the release or spill. Accidental or natural disaster release or spills are usually confined to a localized area and containment action should be taken as safely and promptly as possible.

An emergency exists when the hazardous materials or a chemical spill:

- involves the release of a type or quantity of a chemical that poses an immediate risk to health or
- involves a fire hazard / explosion risk or
- involves a highly dangerous chemical or
- involves unknown or highly reactive chemical(s) or involves a large quantity of chemical(s), (generally over 1 liter of liquid or 1 kg of solid material)

In the event of a Hazardous Materials Release or Spill in the School

Responsibilities
Principal

- Assess the situation
- If positive identification of the material cannot be made, assume the material to be dangerous.
- Evacuate the contaminated area and seal it off. The site of a hazardous materials incident is to be isolated to the extent necessary as soon and safely as possible.
- Attempt to identify the chemical.
- Determine the hazard level presented as reflected in the school Safety Data Sheet (SDS).
- If decontamination can be safely conducted with school assets, do so.
- If not, **Call 911.** Make sure the 911 operator understands that there is a hazardous materials emergency. Provide as much of the following information to the operator as possible- location of release or spill, class of hazardous material, (if known), size of spill, description of

any personal injury, control measures already taken, your name and telephone number, how you can be identified and
your location when emergency responders arrive and stay on the telephone until you are instructed to disconnect by the 911 operator.

- The principal will determine if evacuation is necessary. If necessary, initiate the evacuation procedure immediately.
- Render district's first aid procedures as needed:
  - ✓ know and use your school's Safety Data Sheet for an excellent source of first aid information
  - ✓ be sure you know where SDSs are located and how to find the necessary first-aid information.
  - ✓ seek medical attention.
- Document actions and decisions concerning hazardous materials incident.
- Notify the designated Assistant Superintendent's office.
- To report all significant releases or threatened releases, first call 911. Then call 468-4400, the San Joaquin County Sheriff Office. They will call the SJ County Office of Emergency Services. Call 1-800-852-7550, California OES, Hazardous Materials Unit.
- Call Environmental Health and Safety – 209-468-3420
- Call Maintenance and Operations dispatch (209-331-7193). If incident occurs after school hours contact Alamo Alarms (209-369-7749).
- The building shall not be re-entered until authorization is given by the fire department.

Teachers

- If evacuation becomes necessary, each teacher should account for students under his or her supervision and report missing students to the principal.

Other Support Staff

- Custodial staff assists administrative staff as directed. If safe to do so, contain hazardous material.
- If a school evacuation is ordered, secretarial staff takes enrollment cards and sign-out sheets for off-site student release and parent reunification.

INCIDENT ACTION PLAN - B APPENDIX H

SPILLS OFF SCHOOL PROPERTY
&
HAZARDOUS MATERIALS RELEASE

A hazardous material is any substance chemical, biological, radiological, or explosive in a quantity or form, which may be harmful to humans, domestic animals, wildlife, economic crops or property when released or spilled into the environment. Hazardous materials accidents may occur as the result of human error or natural disaster.

Local businesses in close proximity to schools may use hazardous materials and nearby roads, highways and railways are routinely use to transport hazardous materials.

Release or spills involving hazardous materials are likely to happen without warning and pose a risk to people who may come in contact with the release or spill. Accidental or natural disaster release or spills are usually confined to a localized area and containment action should be taken as safely and promptly as possible.

An emergency exists when the hazardous materials or a chemical spill:

- involves the release of a type or quantity of a chemical that poses an immediate risk to health
- involves a fire hazard / explosion risk
- involves a highly dangerous chemical
- involves unknown or highly reactive chemical(s)
- involves a large quantity of chemical(s), (generally over 1 liter of liquid or 1 kg of solid material)

In the Event of Hazardous Materials Release or Spill Off School Property

RESPONSIBILITIES

Principal

- If positive identification of the material cannot be made, assume the material to be dangerous.
- **Call 911.** Make sure the 911 operator understands that there is a hazardous materials emergency in the area. Provide as much of the following information to the operator as possible- location of release or spill, class of hazardous material, (if known), size of spill, description of any personal injury, control measures already taken, your name and telephone number, how you can be identified and your location when emergency responders arrive, and stay on the telephone until you are instructed to disconnect by the 911 operator.

- The principal will initiate the shelter in-place plan. The alert signal is **LOCKDOWN**.
- Close all windows and doors. Stay in the building. If safe, have custodian disable heating, ventilating, and air conditioning, including the exhaust system in the kitchen.
- Render district's first aid procedures as needed:
  - ✓ use your school's Safety Data Sheet for an excellent source of first aid information.
  - ✓ be sure you know where SDSs are located and how to find the necessary first-aid information.
  - ✓ seek medical attention.
- Document actions and decisions concerning hazardous materials incident.
- Do not proceed outside unless directed by first responders. If required, take action to evacuate the building and if necessary, the school site.
- Keep people upwind of the hazardous materials (i.e. smoke, fumes, gas odor, and dust).
- The building shall not be re-entered until authorization is given by the fire department.
- Tune into the emergency radio system regarding any type of emergency situation.
- The principal will notify the designated Assistant Superintendent's office.
- To report all significant releases or threatened releases, first call 911. Then call 468-4400, the San Joaquin County Sheriff Office. They will call the SJ County Office of Emergency Services. Call 1-800-852-7550, California OES, Hazardous Materials Unit.
- Call Environmental Health and Safety – 209-468-3420
- Call Maintenance and Operations dispatch (209-331-7193). If incident occurs after school hours contact Alamo Alarms (209-369-7749).

Teachers

- If evacuation becomes necessary, each teacher should account for students under his or her supervision and report missing students to the principal.

Other Support Staff

- Custodial staff assists administrative staff as directed. If safe to do so, contain hazardous material.
- If a school evacuation is ordered, secretarial staff takes enrollment cards and sign-out sheets for off-site student release and parent reunification