



CHEMICAL HYGIENE PLAN

MiraCosta College
Chemical Hygiene Plan
November 20, 2019

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I. Purpose

The California Occupational Safety and Health Administration (Cal/OSHA) under Title 8 California Code of Regulations (CCR) General Industry Safety Orders (GISO) §5191 has promulgated a standard entitled, Occupational Exposure to Hazardous Chemicals in Laboratories, which applies to all laboratories that use hazardous chemicals. This section defines a Chemical Hygiene Plan (CHP) as a written program developed and implemented by an employer which sets forth procedures, equipment, personal protective equipment, and work practices that are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular work place and meets the requirements of subsection §5191(e). It specifies that a written chemical hygiene plan must be developed and implemented that includes the necessary work practices, procedures, and policies to ensure that employees are protected from hazardous laboratory chemicals. As required by Cal/OSHA, [CCR §5191](#). Occupational Exposure to Hazardous Chemicals in Laboratories, this Chemical Hygiene Plan (CHP) has been prepared for use by all employees and laboratory students in the safe operation of laboratories. MiraCosta College District's (District) intent is to promote safe laboratory work practices and procedures throughout the District.

II. Scope & Policy

This plan applies to all areas within the District where any person whose act or process may cause workplace exposures to hazardous chemicals, including all laboratories that use hazardous chemicals. The CHP sets forth procedures, equipment, personal protective equipment (PPE), and work practices used to protect employees from the health hazards presented by the use of chemicals within the District. Components of the CHP include responsible Faculty and Staff, standard operating procedures (SOPs) for safety and health, laboratory safety plans (LSPs), engineering control measures, proper operation of engineering controls, provisions for training and information dissemination, provisions for medical examination and consultation, special precautions, and identification of particularly hazardous substances. The CHP may be supplemented by each District site (Oceanside Campus and San Elijo Campus) in order to add laboratory specific information, policies, and procedures to this CHP, usually in the form of an LSP for each department.

The CHP will work in conjunction with the District Hazard Communication Program for all District members involved in any use of hazardous chemicals, as it is a portion of the District's Injury and Illness Prevention Program (IIPP). The CHP incorporates guidelines set forth by the CCR §5191 (hazards in chemical labs), §5139 (Article 107 sets up minimum standards for the prevention of harmful exposure of employees to dusts, fumes, mists, vapors, and gases), §5154.1 (fume hoods), §5155 (airborne contaminants), and §5194 (Hazard Communication). Additionally, the CHP incorporates measures set forth by the Federal Code of Regulations (Part 29, Section 1910.1450 Occupational Exposure to Hazardous Chemicals) and by the National Research Council (Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards).

III. Responsibility In addition to the CHP, each Department and/or Campus is responsible for developing an LSP to address the regulatory requirements specific to each laboratory room, such as Standard Operating Procedures (SOPs), and Chemical Inventories, where applicable. The LSP should also address health and safety concerns that are not part of the CHP, such as radiation safety, if not captured in other written plans or applicable. The CHO will assist in the preparation and reviewing the LSP. Biosafety safe work practices, SOPs and guidelines addressing waste handling is presented in [Bloodborne Pathogens Exposure Control Plan](#)

The District is responsible for this plan and its work areas, including reviewing and updating the plan regularly, when procedures change or when a risk assessment of procedures is conducted. The District Risk Management Officer has the authority to make decisions to ensure the success of the plan. All questions regarding plan requirements should be directed to the District Risk Management Officer, Joseph J. Mazza, ARM-P. This plan is available to all District employees on the main website under [Risk Management > Chemical Hygiene](#).

A. Plan Coordinators

The overall responsibility for the management and support of this CHP lies with the Vice President, Human Resources and the Superintendent/President.

Responsibilities include, but are not limited to:

- 1) Work with the Chemical Hygiene Officer to develop and administer the policies or practices required to support the effective implementation of this Plan.
- 2) Work with other members of the District staff to ensure that adequate training, review, and implementation of the CHP are being completed.
- 3) Implement suitable education/training programs for employees.

B. Risk Management

The District Risk Management Officer is responsible for providing guidance, resources, and assistance with development of CHP guidelines.

Responsibilities include:

- 1) Consult with and notify management of laboratory regulations and requirements.
- 2) Ensure this plan is updated and in compliance with state and federal regulations.
- 3) Manage employee occupational injuries/illnesses related to hazardous chemicals.
- 4) Maintain employee exposure monitoring and medical surveillance records.
- 5) Report to VP, Human Resources on the status of compliance with laboratory regulations and implementation of this plan.

C. Purchasing Department

The District Purchasing Department in conjunction with all relevant departments, is responsible for providing guidance, resources, and assistance with the acquisition of laboratory equipment and materials as recommended by Faculty and the Chemical Hygiene Officer.

Responsibilities to assist the relevant departments include:

- 1) Develop and maintain a list of approved laboratory suppliers.
- 2) Research, select, and publish purchasing options.
- 3) Ensure that all orders use the District's list of approved suppliers.

D. Chemical Hygiene Officer

The Chemical Hygiene Officer (CHO) is in charge of reviewing the CHP annually to determine whether or not the content is still effective and valid and shall give recommendations for updating the CHP. The CHO shall provide technical guidance to employees at all levels of responsibility on matters pertaining to laboratory safety.

Responsibilities include, but are not limited to:

- 1) Perform hazard assessment of overall operations to determine the appropriate safety control requirements which include laboratory practices, Personal Protective Equipment (PPE), engineering controls, and training.
- 2) Review industrial hygiene monitoring data and reports for evidence of employee exposure and/or equipment contamination.
- 3) Review and approve Standard Operating Procedures (SOP).
- 4) Review chemical inventories from departments and facilities that house hazardous substances. Assist as needed with the MSDS Online SDS system.
- 5) Determine medical surveillance requirements of employees, such as pulmonary medical clearance prior to use of respiratory equipment.
- 6) Review plans for new laboratory programs and classes to assess compliance with CHP.
- 7) Audit Lab Safety Plans and laboratory specific programs to assess compliance on local, state, and federal levels.
- 8) Provide technical assistance on storage, classification, compatibility, and hazards of chemicals.
- 9) Coordinate all required safety training.
- 10) Monthly testing of Emergency Eyewash and Deluge Shower Equipment to ensure proper operation following the American National Standards Institute (ANSI) Standard Z358.1-2014 "Emergency Eyewash and Shower Equipment". (Also, Cal/OSHA General Industry Safety Orders §5162. Emergency Eyewash and Shower Equipment.)
 - a) An obstruction-free path within 10 seconds (about 55 feet) is critical because the vision of injured workers can be impaired.

The CHO is also responsible for implementing the CHP at the local operational level for all areas. This responsibility for ensuring safe work practices are followed when hazardous chemical exposures are present.

Responsibilities include, but are not limited to:

- 1) Identify and manage hazardous chemical exposures.
- 2) Ensure suspected or known laboratory injuries and illnesses are identified and reported to District Risk Management immediately.
- 3) Ensure work-related injuries/illnesses are investigated and corrective action is identified, documented and implemented.
- 4) Ensure elements of the CHP are implemented and maintained, and that employees follow established safety procedures.
- 5) Ensure sufficient budgeting is allocated for laboratory improvements.
- 6) Ensure all laboratory equipment, materials, and tools are ordered from approved suppliers.
- 7) Coordinate annual chemical inventory.

- 8) Access to the CHP online and in written form available in the workplace.
- 9) Maintain records of health and safety training of laboratory employees, annual general laboratory inspections, visually inspecting fire extinguishers monthly, annual fume hood surveys, and annual biological safety cabinet (BSC) certification. Maintain copies of training records. Records must be kept for a minimum of 5 years.
- 10) General laboratory safety / housekeeping inspections shall be performed annually.
- 11) Personal Protection Equipment (PPE) shall be inspected on a regular basis for adequate use and condition.
- 12) Dangerous activities, unsafe conditions, unsafe behavior, and any accidents should be reported immediately to the District Risk Management Officer, in emergency situations College Police at X6911.
- 13) Ensure proper compliance with Cal/OSHA and Federal OSHA Regulated Chemical Carcinogens.

The CHO and employees working in the laboratory will collaborate on the recognition of hazards related to the use, storage, and disposal of laboratory chemicals

Laboratory specific training is the responsibility of the department under direction from the CHO, who may delegate the actual training to third-party providers. The CHO is the primary contact with all laboratory safety questions or concerns in the use of these procedures.

Any experimental work outside of normal coursework should be reviewed and approved by the CHO who will contact the District Risk Management Officer for guidance.

CHO contact information: Fill-in the box below with the contact information for the current CHO designated for your work site and update this information as needed.

Chemical Hygiene Officer – MiraCosta College
 Name: Joseph J. Mazza, ARM-P
 Title: District Risk Management Officer
 Phone/Email: 760-795-6866 jmazza@miracosta.edu

E. Employees / Laboratory Faculty and Staff

District employees and laboratory Faculty and Staff are responsible to review and acknowledge receipt of the CHP and shall follow the procedures outlined within this CHP.

Employees are responsible for, but are not limited to:

- 1) Understand what tasks they perform that may have occupational exposures to chemicals.
- 2) Report all chemical exposures, conditions, injuries or illnesses immediately to their direct supervisor.
- 3) Actively participate in appropriate trainings and assessments presented by the District, including, but not limited to Hazard Communication, Bloodborne Pathogens Exposure Prevention, Chemical Handling, Waste Disposal, and Proper Use of all Safety Equipment and PPE as related to chemical safety and safe laboratory practices.
- 4) Follow all procedures and practices reviewed in training classes, safety meetings, related memos and safety bulletins.
- 5) Report chemical hygiene concerns to the CHO and the direct supervisor promptly.
- 6) Set up *Caution Wet Floor* signs when the eyewash equipment is used during an emergency event for safety of Faculty, Staff, and students in the immediate area.

- a. Contact Facilities immediately at X6875 for assistance and guidance with waste water cleanup after the event.

F. Custodial & Maintenance Staff

District Custodial and Maintenance Staff assigned to buildings with laboratory activities involving hazardous substances are responsible for, but are not limited to:

- 1) Attend Hazard Communication training, which familiarizes those individuals with potential hazards of performing normal work tasks in a laboratory setting.
- 2) Actively participate in trainings and assessments presented by the District.
- 3) Report unsafe conditions to immediate supervisor.

IV. Laboratory Safety Inspections

The District has implemented the following inspections based on regulatory requirements. The CHO, or designee, shall confirm these inspections are completed as outlined. The use of the Laboratory Safety Checklist (see Appendix A page 33) is encouraged.

- 1) Emergency eyewash stations and deluge showers testing shall be performed and documented monthly to ensure proper operation.
- 2) Fume hood ventilation rate surveys shall be conducted annually by an external fume hood service provider. Ventilation rate surveys shall also be conducted after any changes have been made to the ventilation system and/or other engineering controls that affect airflow.
- 3) General laboratory safety / housekeeping inspections shall be performed annually.
- 4) PPE shall be inspected on a regular basis for adequate use and condition.

V. Recordkeeping

Records must be kept for a minimum of five (5) years by the District. Copies of employee trainings and safety inspections/testing should be available to the District Risk Management Officer. Recordkeeping shall include the following items:

- 1) Changes to the CHP.
- 2) Health and safety training for employees working in the laboratory or around hazardous substances.
- 3) Annual general laboratory inspections by the CHO.
- 4) Monthly testing of emergency eyewashes and deluge showers by each respective site.
- 5) Annual fume hood surveys.

VI. Standard Operating Procedures: General Laboratory Guidelines

This section outlines general laboratory guidelines for safe laboratory practices, including the use and handling of chemicals within the laboratory. The CHO is responsible to ensure that all laboratory Faculty and Staff members are trained in the use of these procedures. Faculty are responsible to ensure that all laboratory students are made aware of these procedures as well. Contact the CHO with all safety questions or concerns.

A. General Guidelines

- 1) Follow standard operating procedures at all times.

- 2) Unauthorized persons should not be allowed in the laboratory.
- 3) Report unsafe conditions to the CHO immediately.
- 4) Avoid working alone in the laboratory when conducting experiments or procedures involving hazardous substances/materials.
- 5) Follow assigned work schedules unless a deviation is authorized by the area supervisor.
- 6) Notify supervisors of chemical sensitivities or allergies.
- 7) Read the Safety Data Sheet (SDS) and label before using a chemical.
- 8) Know the location and proper use of safety equipment.
- 9) Plan safety procedures before beginning any operation.
- 10) Maintain situational awareness.
- 11) Make others aware of special hazards associated with your work.
- 12) Unauthorized experiments (Not part of curriculum) should not be performed.
- 13) Eating, drinking, gum chewing, smoking, or the application of cosmetics and contact lenses are not permitted in the laboratory classrooms, preparation area, or in any area where hazardous substances will be handled or stored.
- 14) Food and drink for consumption is not permitted or allowed to be stored in the laboratory and as safely removed as possible from any chemicals is space is limited.
- 15) Laboratory refrigerators, ice chests, cold rooms, and ovens should not be used for food storage or preparation.
- 16) Pipetting by mouth is prohibited.
- 17) Handling chemicals is limited to amounts that do not exceed the Cal/OSHA Permissible Exposure Limits (PELs) or the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs). [Cal/OSHA PELs](#)

Properly dispose of chemical wastes according to the [UPENN Laboratory Chemical Waste Management Guidelines](#)

B. Hygiene and Conduct

The most common routes of entry of hazardous substances into the body are inhalation, ingestion, and skin contact. The harmful effects of hazardous substances can be reduced if the following considerations are taken.

- 1) Hands should be washed frequently with soap and water to reduce chemical exposure through ingestion or skin contact.
- 2) Long hair, loose clothing, and loose jewelry should be tied down to prevent accidental exposure.
- 3) Clothing should be worn that minimizes exposed skin (i.e. long pants, etc.).
- 4) Closed toe and closed heel shoes are required in the laboratory. Individuals wearing sandals or flip flops are not allowed in the laboratory.
- 5) Standard PPE should be available for use including approved eyewear and gloves. Always wear appropriate PPE.
- 6) Inappropriate behavior that might startle and/or distract another individual should be avoided to prevent sudden reactions and accidents.
- 7) Dangerous activities, unsafe conditions, unsafe behavior, and any accidents should be reported immediately to the CHO, or in emergency situations, College Police at X6911.
- 8) PPE must be worn at all times in laboratory classrooms and preparation areas while hazardous substances are in use, even if not directly used by the individual.

C. Housekeeping

- 1) Work areas should be kept clean and uncluttered.
- 2) Equipment and supplies should be returned to their appropriate area after the lab session/class has finished.
- 3) Dry any wet floors to prevent slips and falls.
- 4) Keep aisles, walking areas, pathways to emergency equipment clear of any obstacles.
- 5) Do not clutter work area with unnecessary supplies/materials.

D. Laboratory Equipment

- 1) Equipment should only be used for its intended purpose.
- 2) All Faculty and Staff shall receive training and learn how to use the equipment prior to the first date of use.
- 3) Emergency equipment should be inspected periodically. Refer to Section IV for more details.
- 4) Damaged equipment should not be used. The inactive equipment should be labeled with the date of damage and that it is decommissioned until repaired or replaced.
- 5) Broken glassware shall not be used or repurposed.
- 6) Broken glassware shall be immediately disposed of in the labeled glass waste bin.
- 7) Equipment should be periodically cleaned.
- 8) Equipment should receive preventative maintenance at a schedule based on manufacturer or professional recommendations.
- 9) All compressed gas cylinders should be secured to a cylinder rack or chained to a wall/bench using a two-point system with a shoe.
- 10) Shelves taller than five feet (5 ft.) should have seismic restraints to prevent items from falling.
- 11) Equipment greater than five feet (5 ft.) tall should be seismically secured to prevent falling.

VII. Standard Operating Procedures: Chemical Use and Management

The CHO and employees working in the laboratory are responsible for the recognition of hazards related to the use, storage, and disposal of laboratory chemicals. The two most important aspects to the recognition process are ensuring that laboratory Faculty and Staff have access to Safety Data Sheets (SDS) and that an inventory of laboratory chemicals is maintained.

As necessary, the CHP shall be supplemented by each District site (Oceanside Campus and San Elijo Campus) to add laboratory specific information, policies, and procedures to this CHP, usually in the form of a LSP for each department or division.

A. SDS Information

SDS, formerly known as Material Safety Data Sheets (MSDS), are documents prepared by the manufacturer of the chemical and contain specific information related to the hazards, proper storage, safe handling, disposal, transport, etc. Each laboratory or area where hazardous chemicals are found is required to keep and make available printed SDS for all chemicals housed or used in that area. The District also provides access to an online SDS system called *MSDS Online*, which provides instant SDS documents for chemicals listed in the chemical inventory across all campuses and facilities. For information on how to access and training on how to use *MSDS Online*, consult Facilities.

SDSs are structured documents that follow the American National Standards Institute (ANSI) standardized SDS format and include the following 16 sections:

Section 1 gives details on what the chemical or substance is, Chemical Abstracts Service (CAS) number, synonyms, the name of the company issuing the data sheet, and often an emergency contact number.

Section 2 identifies the OSHA hazardous ingredients and may include other key ingredients and exposure limits.

Section 3 lists the major health effects associated with the chemical. Sometimes both the acute and chronic hazards are given.

Section 4 provides first aid measures that should be initiated in case of exposure.

Section 5 presents the fire-fighting measures to be taken.

Section 6 details the procedures to be taken in case of an accidental release. The instructions given may not be sufficiently comprehensive in all cases, and local rules and procedures should be utilized to supplement the information given in the SDS.

Section 7 addresses the storage and handling information for the chemical. This is an important section as it contains information on the flammability, explosive risk, propensity to form peroxides, and chemical incompatibility for the substance. It also addresses any special storage requirements for the chemical (i.e., special cabinets or refrigerators).

Section 8 outlines the regulatory limits for exposure, usually the maximum PEL. The PEL, issued by the Occupational Safety and Health Administration, tells the concentration of air contamination a person can be exposed to for 8 hours a day, 40 hours per week over a working lifetime (30 years) without suffering adverse health effects. It also provides information on PPE.

Section 9 gives the physical and chemical properties of the chemical. Information such as the evaporation rate, specific gravity, and flash points are given.

Section 10 gives the stability and reactivity of the chemical with information about chemical incompatibilities and conditions to avoid.

Section 11 provides both the acute and chronic toxicity of the chemical and any health effects that may be attributed to the chemical.

Section 12 identifies both the eco toxicity and the environmental fate of the chemical.

Section 13 offers suggestions for the disposal of the chemical. Local, state, and Federal regulations should be followed.

Section 14 gives the transportation information required by the Department of Transportation. This often identifies the dangers associated with the chemical, such as flammability, toxicity, radioactivity, and reactivity.

Section 15 outlines the regulatory information for the chemical. The hazard codes for the chemical are given along with principle hazards associated with the chemical. A variety of country and/or state specific details may be given.

Section 16 provides additional information such as the label warnings, preparation and revision dates, name of the person or firm that prepared the SDS, disclaimers, and references used to prepare the SDS.

B. Chemical Labeling

All chemicals and reagents must be labeled in accordance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). No employee will use, store, or allow any other person to use or store any hazardous substance in a laboratory if the container (including bags, barrels, bottles, boxes, cans, cylinders, drums and reaction vessels) does not meet the labeling requirements detailed below. (See APPENDIX B for sample label, page 39)

1) Purchased/Manufactured Chemicals

The existing label on a container from a supplier must not be removed, altered, or defaced. If a chemical container's original label must be replaced, the new label must contain the same information as the original. All chemicals received by the District must have the following identifiers:

- Product identifier (Chemical name as it appears on the SDS)
- Hazard Warning(s) – provide users with an immediate understanding of primary health and/or physical hazards of the chemical through the use of words, pictures, pictograms, symbols, or any combination of these elements.
- Precautionary statement(s)
- Name, address, and telephone number of manufacturer, importer, or other responsible party

Markings must be legible, permanently displayed and written in English. If District or any facility receives a chemical without these markings, the chemical will NOT BE USED and the substance is to be sent back to the supplier.

Add to the commercially packaged chemicals the date received and date first opened. Also, add the expiration or "use by" date if one is not present. If a chemical is sent from the manufacturer without a "use by" date, then it is recommended to contact the manufacturer with the specific information found on the original container to determine the "use by" date. If a "use by" date is not specified, then the default should be 1 year. After "use by" date, refer to section VII. D. Waste Disposal.

2) Secondary Containers and Prepared Solutions

Hazardous substances transferred from the original manufacturer's container to portable or other vessels are referred to as "secondary containers". Secondary containers must comply with GHS labeling requirements except when the material is used within the work shift of the individual who makes the transfer.

All secondary containers shall be labeled with the following identifiers:

- Chemical name (as it appears on the SDS)
- Name of chemical manufacturer or person who prepared the solution
- Necessary handling and hazard information
- Concentration or purity
- Date prepared
- Expiration or “use by” date
- National Fire Protection Association (NFPA) code (not required)
- Common name (not required).

Any chemicals that are prepared or produced in the laboratory require special consideration:

- If the chemical substance is produced exclusively for the laboratory’s own use, the CHO, in conjunction with the Department Chair and Faculty, will determine if it is hazardous. The SDS should always be the guiding source for chemical substances.
- If the chemical substance is produced as a byproduct whose composition is not known, it shall be assumed to be hazardous.

3) Containers in Immediate Use

Chemicals and reagents to be used within a 2-week period should be labeled as follows:

- Chemical name (as it appears on the SDS)
- Necessary handling and hazard information

4) Waste Containers

All containers used for chemical waste should be labeled in accordance with the District Waste Management Program.

C. Chemical Storage

Chemicals should be stored in designated facilities with ample routes of access, plenty of space for storage, and have chemicals segregated based on their compatibilities.

[CCR §5164. Storage of Hazardous Substances.](#)

In general, Safety Data Sheets (SDSs) are the best source for proper storage guidance and chemical incompatibility. (See Section VII. A.) The following are general guidelines.

1) Compressed Gases

- Store away from external heat sources and away from falling objects that may cause damage
- Store upright and secured to a wall or post with valve protection caps
- Oxygen cylinders will be segregated from flammable gas cylinders by at least 20 feet by a non-combustible wall 5 feet high
- Oxygen storage areas will be clearly marked “Oxidizer”

- Flammable gas cylinder storage areas will be clearly marked “Flammable Gas” and “No Smoking or Open Flame”
- Gas cylinders will be marked with “Full” or “Empty”
- Gas cylinders will be clearly marked with the chemical or trade name
- Empty cylinders shall not be refilled except by suppliers
- All connecting hoses, couplings, and regulators shall be regularly inspected
- Check valves/traps shall be installed in the discharge line to prevent back flow into the cylinder
- Do not store aerosols in areas where temperatures may exceed 120° F

2) Cryogenics

- Store cryogenic chemicals (e.g. liquid nitrogen) per manufacturer recommendations
- Use appropriate PPE when dispensing, such as a face shield with goggles, cryogenic apron, and cryogenic protective gloves
- If accidental exposure, immediately rinse the skin with warm water for 15 minutes and then seek medical attention

3) Corrosive Liquids

- Store corrosives in a dedicated cabinet within a well-ventilated area
- Small quantities of corrosives can be stored on polyethylene shelves or ceramic trays that can contain spills/leaks
- Create spill containment barriers for storing bulk corrosives
- Acids will be segregated from substances they are reactive with (metals, oxides, cyanates, fluorides, hydroxides, amines, carbonates, and sulfides)
- Oxidizing acids will be segregated from organic acids and flammable substances
- Nitric acid will be segregated from other acids and bases
- Always wear splash proof goggles and the appropriate gloves when handling corrosives
- Areas that contain large quantities of corrosives shall be equipped with eyewash stations and deluge showers
- Corrosives should not be stored at or above eye level

4) Flammable Liquids

- Store in a well-ventilated area away from oxidizers and other sources of heat and ignition
- Store in covered, flammable storage cabinets with self-closing doors
- Never use air pressure to remove liquids from a drum or tank
- Provide spill containment equipment and material near storage areas
- All flammable liquid storing areas should be identified with signs and symbols
- Flammable liquids should not be dispensed from containers greater than 4 liters
- Use only approved safety cans or media bottles to dispense flammable liquids
- Fire extinguishers (Class A, B, C) should be readily accessible to employees without subjecting the employees to possible injury and so that the travel distance from the Class B hazard area to any extinguisher is 50 feet or less. [CCR §6151. Portable Fire Extinguishers](#)
- Flammable storage areas should be clearly marked “No Smoking or Open Flame”

5) Oxidizers

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

6) Peroxides

- Peroxides and peroxide forms must be clearly labeled with pertinent information including the date opened
- Peroxide quantities should be limited to the minimum required
- Unused peroxides should not be returned to the container
- Spills should be cleaned up immediately
- Do not use metal utensils to handle peroxides
- Smoking, open flames, friction, or other heat sources and impact sources should be avoided while using peroxides
- Store at the lowest possible and appropriate storage temperature
- Peroxides must be diluted before disposal

7) Reactive Substances

- Store in a cool, dry, and well-ventilated area
- Reactive substances should be kept away from sources of heat and ignition
- Water reactive material should not be stored in a room with an automatic water sprinkler system unless it is certain the material will remain dry
- Pyrophoric materials such as metals should be segregated from halogenated hydrocarbons, oxidizers, and moisture

8) Solvents

- Store and use in a cool, well-ventilated areas
- Keep away from flames or excessive heat
- Provide spill kits that are capable of handling accidental releases

9) Toxics

- Store in a container marked "Toxic"
- Dedicated cabinet should be kept locked
- Toxics should be used in a well-ventilated area
- Segregate toxics from acids
- Poison Control phone number should be posted in the designated room/area for poisons: **1-800-222-1222**
- Highly toxic substances (e.g. hydrazine, mercuric chloride, osmium tetroxide, white or red phosphorus, sodium azide, and sodium cyanide) should only be used under strict supervision from a trained instructor/staff member

D. Waste Disposal

Disposing hazardous waste appropriately is critical toward protecting Faculty and Staff, waste handlers, and the environment. Hazardous waste is defined as a substance or material that poses a hazard to human health or the environment when handled improperly. Types of hazardous waste include abandoned chemicals, unused chemicals, chemicals stored in deteriorating/shoddy containers, unlabeled chemicals, and containers with different types of labels.

- 1) Use labeled hazardous waste containers and follow the established procedures for waste control/reduction. Refer to [UPENN Laboratory Chemical Waste Management Guidelines](#) for more details.

VIII. Employee Training

Laboratory Faculty, Staff, student workers, and volunteers shall be trained, as appropriate for their discipline and role, to ensure that they are aware and knowledgeable of the chemical hazards with which they work. General trainings on lab safety, chemical handling, chemical spills, PPE, and more are available through the District Risk Management Officer. Laboratory specific training is the responsibility of the department under direction from the CHO, who may delegate the actual training to third-party providers. The CHO should contact the District Risk Management Officer for guidance. Annual and required training records shall be maintained by the District and copies of records are available.

A. Training shall be provided when:

- Initial assignment to work area where a hazardous substance is present
- Introduction of new chemicals are purchased for the work area
- Specific regulation frequencies
- Employee training is identified as needed by the CHO or in consultation with the District Risk Management Officer

B. Trainings may include, but are not limited to:

- Contents of the District CHP
- Location, availability, and applicable details of the CHP
- Locations and access to SDS, safe lab practices, chemical handling, chemical storage and emergency procedure documents
- Relevant regulations of the chemicals in work area
- Relevant exposure limits of hazardous substances, along with signs and/or symptoms associated with exposure to hazardous substances used in the laboratory
- Methods and observations to detect the presence or release of a hazardous chemical
- Methods used to minimize chemical exposures, and measures employees can take to protect themselves from such hazards
- Physical, chemical, and health hazards of the chemicals in the work area
- Required and assigned safety training, including SafeColleges online training as a primary source, not limited to:

- a) Chemical Spills Overview
- b) Eye and Face Protection
- c) Fire Extinguisher Safety
- d) Hazard Communication: Right to Understand (GHS)
- e) Mercury Spills
- f) Personal Protective Equipment (PPE)
- g) Respiratory Protection
- h) Safety Data Sheets (SDS)
- i) Science Lab Safety (Includes Chemical Hygiene Plan basics)
- j) Science Laboratory Chemical Spills
- l) Workplace Injury Prevention

IX. Control Measures for Extremely Hazardous Substances

Additional control measures outside of general chemical hygiene are important to protect the user from extremely hazardous chemicals or carcinogens. Such chemicals are divided in to two groups, according to their National Fire Protection Associations (NFPA) and Globally Harmonized System (GHS) classification.

| Route of Entry | NFPA 704 Health Hazard Classifications | | | | |
|---------------------------------------|--|------------|------------|--------------|---------|
| | 4 | 3 | 2 | 1 | 0 |
| Oral LD ₅₀ (mg/kg) | 0-5 | >5-50 | >50-500 | >500-2000 | >2000 |
| Skin Contact LD ₅₀ (mg/kg) | 0-40 | >40-200 | >200-1000 | >1000-2000 | >2000 |
| Inhalation LC ₅₀ (ppm) | 0-1000 | >1000-3000 | >3000-5000 | >5000-10,000 | >10,000 |

| Route of Entry | GHS Acute Toxicity Ratings | | | |
|--|----------------------------|------------|------------|-------------|
| | 1 | 2 | 3 | 4 |
| Oral LD ₅₀ (mg/kg) | 0-≤5 | >5-≤50 | 50-≤300 | 300-<2000 |
| Skin Contact LD ₅₀ (mg/kg) | 0-≤50 | >50-≤200 | >200-≤1000 | >1000-≤2000 |
| Inhalation (gas) LC ₅₀ (ppm) | 0-≤100 | >100-≤500 | >500-≤2500 | >2500-≤5000 |
| Inhalation (vapors) LC ₅₀ (mg/L) | 0-≤0.5 | >0.5-≤2.0 | >2.0-≤10.0 | >10.0-≤20.0 |
| Inhalation (dust & mist) LC ₅₀ (mg/L) | 0-≤0.05 | >0.05-≤0.5 | >0.5-≤1.0 | >1.0-≤5.0 |

Group A captures chemicals that exhibit moderate, chronic, or high acute toxicity. These chemicals have a NFPA health hazard rating of 1 or 2, or a GHS acute toxicity rating of 3 or 4.

Group B includes chemicals that exhibit high chronic toxicity. These substances cause damage after repeated exposure over a period of time. Chemicals with a NFPA health hazard rating of 3 or 4, or a GHS acute toxicity rating of 1 or 2 are included. Group B may also include [carcinogens](#) (or search the NIH report on carcinogens), reproductive toxins, mutagens, teratogens, and sensitizers (see [Reproductive Hazards, Teratogenic Agents and Pregnancy](#) for other resources). Laboratory personnel (male and female), especially those of childbearing age, should be notified of any reproductive toxins being used in the laboratory. Any employee who is pregnant or planning to become pregnant should contact CHO and a personal physician to assess potential exposures.

The following precautions and procedures should be used in addition to all general rules and procedures mentioned in the CHP when handling Group A or B chemicals.

Group A – Moderate or Chronic or High Acute Toxicity

- Maintain strict records of the amounts used and Faculty and Staff involved
- Two employees shall be present when handling hazardous substances that fall under this category
- Conduct preparations and experiments in fume hoods with chemicals that can create aerosols
- Prepare to contain accidental spills
- Only individuals with appropriate PPE should contain spills
- Other Faculty and Staff shall be notified when the chemical is in use
- If cyanides are used, a posting should be in plain sight on the doors or chemical hoods
- Chemical waste in this category shall be placed in closed and impenetrable containers. The containers should be labeled with the contents, type of hazards, name of the individual using the substance, and the accumulation start date.

Group B - High Chronic Toxicity

- Written approval from the Department Chair and CHO must be obtained before purchase/use of chemicals in this Section.
- Any experimental work should be consulted with the Chair and approved by the Dean and the CHO
- Consult with the Maintenance and Operations Department and District Risk Management Officer when appropriate
- Chemical containers shall be labeled with large warning signs stating “*Warning! High Chronic Toxicity*” or “*Warning! Cancer Suspect Agent*”
- All work with material of this category shall be performed in a fume hood designed to handle these types of substances
- Controlled areas shall be marked with signs indicating “*Warning! Toxic Substance/Cancer Suspect in USE: Authorized Faculty and Staff Only*”
- Be sure the controlled area is decontaminated prior to and after use with the extremely hazardous substance
- Faculty and Staff should remove PPE when leaving the controlled area and thoroughly wash hands, forearms, face, and neck

Cal/OSHA and Federal OSHA Carcinogens

a) Cal/OSHA Regulated Chemical Carcinogens

- CHO will assign duties involving Cal/OSHA Regulated Carcinogens to the users and ensure they are trained in the hazards of the operation prior to the assignment.
- CHO will ensure engineering controls are installed and used, and correct work errors and conditions that may result in the release of Cal/OSHA Regulated Carcinogens.
- CHO will consult District Risk Management to conduct personal exposure monitoring if area concentrations are suspected to exceed Cal/OSHA action levels.
- CHO will prepare SOPs for specific Cal/OSHA Regulated Carcinogens or processes using these chemicals. Approved SOPs will be forwarded to the District Risk Management Officer.

- Maintain a current inventory of Cal/OSHA Regulated Carcinogens and a list of uses, as well as designated workplaces for use. Provide a copy to District Risk Management.
- As prescribed by CCR §5203, Carcinogen Report of Use Requirements. [Carcinogen Report of Use Requirements](#), CHO will register the regulated carcinogens used within the District with the Division of Occupational Safety and Health.
- Report all accidents/incidents which result in the exposure of employees or the environment to a regulated carcinogen to your direct supervisor immediately.
 - The report shall include facts about the occurrence and any medical treatment administered.
 - Supervisor must investigate all reported exposures and submit Report of Accident; [Supervisor's Report of Accident](#) to the District Risk Management Officer within 24 hours of an accident/incident.
 - The injured employee or volunteer should complete and submit: [Workers' Compensation Claim Form \(DWC 1\)](#)
- Use only in designated area with suitable warning signs for others.
 - Everyone who works in designated areas must ensure that they understand and follow the requirements for the carcinogen used, including the contents of the SOPs.
- In addition to PPE, use appropriate engineering controls (i.e. fume hoods).
- Store chemicals in a chemically resistant container in a well-ventilated area.
- Decontaminate the area and all equipment in the fume hood before and after removing them.
- Use a vacuum with a HEPA filter vented into the hood when cleaning up dry material.
- Waste must be stored in a closed, labeled, and impenetrable container that is labeled with the contents, concentration, accumulation date, name of user, and a sign that states "Cancer-Suspect Agent".

b) Federal OSHA Highly Hazardous Chemicals & Carcinogens

The current list of highly hazardous chemicals defined by OSHA can be found at the following link 29 CFR 1910.119 Appendix C page 40.

[List of Highly Hazardous Chemicals, Toxics and Reactives](#)

X. Control Measures for Reducing Hazard Exposure

Engineering and administrative controls are important and effective methods for limiting exposure to chemicals. The most effective way to prevent adverse health effects from chemical exposure is the substitution of less hazardous chemicals. Note that substitution is not always practical or feasible in laboratory operations; therefore, the following controls can be implemented to reduce risk.

A. Engineering and Administrative Controls

Engineering controls are considered very reliable for protecting employees and the environment.

Some examples of engineering controls are the following:

- Air containment removal devices (HEPA filters, cold traps)
- Biosafety, flammable and corrosive cabinets
- Chemical fume hoods
- Chemical segregation
- Closed systems
- Glove boxes
- Negative air pressure in the workplace
- Non-permeable work surfaces
- Secondary containers

Administrative controls for minimizing employee exposure to hazardous substances include:

- Following SOPs for laboratory work involving hazardous substances and general laboratory health and safety procedures.
- Review of plans for new and renovated laboratory equipment and work areas prior to construction
- Scaling down the size of the experiment
- Substitution of less hazardous equipment
- Prior approval for laboratory activities involving particularly hazardous substances or procedures

Best practices include, but are not limited to:

- Elimination of power strips and extension cords within fume hoods
- For electrical equipment used within fume hoods, cords must run outside to a GFI receptacle
- Hot plates are considered safe if used with flammables

B. Ventilation

General lab ventilation shall provide airflow into the laboratory from non-laboratory areas and out to the exterior of the building. Ventilation is provided for two basic considerations:

- 1) The comfort of the building occupants; and
- 2) Health and safety considerations for individuals working in laboratories, preparation, and chemical storage facilities. Laboratory doors should remain closed except for egress and entrance. Local exhaust ventilation equipment is a commonly used engineering control in the lab. Usually, this is a chemical fume hood, but it also includes ventilated bench top cabinets, spot exhaust devices, and filtered cabinets for using hazardous solids.

C. Biosafety, Flammable, and Corrosive Storage Cabinets

- 1) The Biological Safety Cabinet (BSC, aka. Biosafety Cabinet) is commonly used as a containment and protection device in laboratories working with biohazardous and infectious microorganisms. Cabinets are also used for maintaining aseptic conditions when working with cell cultures. The major functional element of a BSC is its ability to create a near-sterile environment through the use of High Efficiency Particulate Air (HEPA) filters. Thus, BSCs provide Faculty and Staff, environmental, and product protection when appropriate practices and procedures are followed.

There are three different classes of BSCs which are not directly related to the Biological Safety Levels (BSLs) required for the microbiological agent being used. Generally, Class I and Class II cabinets can be used for work at BSLs 1 to 3. Class III cabinets are usually reserved for work at BSL4, although a Class II cabinet can be used at this level if the appropriate PPE is used.

- Class I BSC: A ventilated cabinet for Faculty and Staff and environmental protection with non-recirculated inward airflow away from the user. The cabinet exhaust air is HEPA filtered before it is discharged to the outside atmosphere. This cabinet resembles a chemical fume hood with a filtered exhaust and is suitable for work with low and moderate risk biological agents where no product protection is required.
- Class II BSC: A ventilated cabinet for Faculty and Staff, product and environmental protection having (1) an open front with inward airflow for user protection, (2) downward HEPA-filtered; laminar airflow for product protection, and (3) HEPA- filtered exhausted air for environmental protection. Class II cabinets are suitable for low- and moderate-risk biological agents. There are four recognized types of Class II biosafety cabinets that are widely used. These are Class II types: A, B1, B2, and B3. The nature of the particular research operation, the characteristics of a laboratory's exhaust system, and the mandated regulations will determine which type of Class II cabinet can be used.
- Class III Biosafety Cabinet: A totally enclosed ventilated cabinet of gas-tight construction. Operations in the cabinet are conducted through attached rubber gloves. The cabinet is maintained under negative air pressure of at least 0.5 inches (12.7 mm) water gauge. Supply air is drawn into the cabinet through HEPA filters. The exhaust air is treated by double HEPA filtration. Class III cabinets are suitable for high-risk biological agents and are accompanied by auxiliary safety equipment.

NOTE: Hazardous chemicals cannot be used in a biosafety cabinet. Damage to the cabinet could result in rendering the cabinet ineffective.

2) Flammable Cabinets should only be used to store flammable-type chemicals. The following are requirements when using and purchasing flammable cabinets.

- Cabinets must comply with state NFPA standards
- Cabinets must have self-closing door(s)
- Cabinets must have signage on outside of door(s) with red lettering stating "Flammable Keep Fire Away"
- Two doors are required on all cabinets except 10-20-gallon sizes where one door is sufficient. Where two doors are required, they may either be bi-folding or hinged on side
- Cabinets must be of approved metal construction and meet minimum construction requirements:
 - Bottom, top, sides, and door(s) of cabinet shall be at least 18 gauge sheet metal and double walled 1 ½ inch air space
 - Joints must be riveted, welded, or made liquid tight by an equally effective means
 - Door must be provided with three-point latch arrangement and the doorsill shall be raised at least two inches above the bottom of the cabinet to retain spilled liquid

- 3) Corrosive Storage Cabinets are made of polyethylene, 18-gauge steel powder coated, HDPE, or wood laminate to prevent hazardous leakage of corrosive acids and/or bases.

D. Chemical Fume Hood

A fume hood is a local exhaust device whose primary purpose is to protect the operator from hazards of airborne chemical contaminants. The secondary purpose is to protect people and property against small fires and explosions. The fume hood must be used properly to allow it to function correctly and remove contaminants from the breathing area of the user.

Operators of the fume hood should check the area daily for visible blockage of airflow. Large items or numerous containers can impede the flow of air. Airflow monitor devices should be observed before each use to check that the hood is functioning. If the hood does not contain a monitor, place a tissue paper strip at the opening to observe inward directional airflow. Users should keep the interior hood surfaces in a clean condition.

The District's Facilities Department has a third party check the fume hood airflow annually to confirm that the airflow into the hood is not compromised by cross drafts, the hood has a uniform inward pattern, and the average velocity of air moving into the hood is within an acceptable range. Guidelines and results are noted on the assessment sticker placed on the front of the hood. If results are not acceptable a notice will be placed on the hood sash and repair request sent to the Facilities Department.

A solid colored arrow sticker or line marking on the hood and sash indicates maximum sash height at which acceptable airflow performance results were checked. The stickers or markings indicate the proper sash opening for hood use. In the event a hood lacks a hood or sash sticker or the test date is older than one year, notify your direct supervisor. Equipment failures or problems should be reported to your supervisor immediately, and the sash should be lowered all the way down and a notice placed on the hood sash until the fume hood is serviced.

Guidelines for Chemical Fume Hood Use:

- Use chemicals in the hood that may generate contaminants near or above exposure limits
- Do not have sources of ignition inside the hood when flammable liquids or gases are present
- Visually inspect the device (and flow monitor) daily or before each use
- Keep all items 6 inches back from the front edge of the hood to avoid blocking the airflow path
- Keep slot openings at the back of the hood free from blockage with large objects or numerous containers
- Elevate large objects 2 inches off the floor of the hood so air can pass under the object and out the back slots in the hood
- Close the sash when the hood is not in use
- During hood use, lower the sash to the sash arrow sticker, below the chin or more if possible
- Lower and use the sash as a safety shield when working with reactive materials or materials that may splatter
- Do not store chemicals in hoods

E. Electrical Extension Cords

The National Electric Code (NFPA 70) prohibits the use of extension cords as a substitute for permanent wiring. Multiple plug outlet adapters are also prohibited. If additional electrical outlets are needed in a work area, the department can request to have additional outlets installed by Facilities Department. However, power strips with covered outlets and a fuse are acceptable.

F. Emergency Eyewash and Deluge Shower

Eyewash stations and deluge showers are installed in or near laboratories, chemical preparation areas, or chemical storage areas in case of a chemical emergency as required under:

American National Standards Institute (ANSI) Standard Z358.1-2014 "Emergency Eyewash and Shower Equipment". (Also, Cal/OSHA General Industry Safety Orders §5162. Emergency Eyewash and Shower Equipment.)

Safety showers and eyewash stations are tested periodically (monthly) for use and effectiveness. Additionally, all laboratory Faculty and Staff are trained in the proper use of the shower and eyewash stations. Laboratory Faculty and Staff should also ensure that access routes to showers and eyewash stations are free from obstructions and obstacles. If problems are noted with water flow, contact the Facilities Department immediately.

G. Gas Hose Connectors

Per NFPA 54: National Fuel Gas Code, gas hose connectors (i.e. hoses connecting a gas source to an appliance or equipment), are allowed to be used for laboratory equipment such as Bunsen/Meker-Fisher burners, provided that all of the following conditions are met:

- A shut off valve must be installed where the connector is attached
- The connector shall not exceed 6 feet
- The connector shall not be concealed nor shall it pass from room to room or through walls, ceilings, or floors
- Tubing made of latex shall not be used as a gas source and a burner

California Plumbing Code 1210.11.3 Shutoff Valve for Laboratories; Each laboratory space containing two or more gas outlets installed on tables, benches, or in hoods in educational, research, commercial and industrial occupancies shall have a single shutoff valve through which such gas outlets are supplied. The shutoff valve shall be accessible and shall be located within the laboratory or located adjacent to the laboratory's egress door and shall be identified. [NFPA 54:7.9.2.4]. Bunsen burner tubing should be regularly inspected for brittleness, cracking, pinholes, cuts etc., and replaced if there is any evidence of damage or poor fit. Small suspected leakage of Bunsen burner tubing can be confirmed by applying a dilute 1% soap solution to the suspected area with a small paint brush.

H. Machine Guarding and Shielding

All mechanical equipment should be adequately furnished with guards that prevent access to electrical connections or moving parts, e.g., belts and pulleys of a vacuum pump. Each laboratory employee should inspect equipment before using it to ensure that the guards are in place and functional. Careful design of guards is vital. An ineffective guard can be worse than none at all, because it can give a false sense of security. Emergency shutoff devices may be needed in addition to electrical and mechanical guarding.

Safety shielding should be used for any operation having the potential for explosion and must be placed so that all Faculty and Staff in the area are protected from hazard, such as whenever the following occur:

- A reaction is attempted for the first time; small quantities of reactants should be used to minimize hazards
- A familiar reaction is carried out on a larger than usual scale (5-10 times more material)
- An operation is carried out under non-ambient conditions

I. Personal Protective Equipment

PPE is used only if substitution, engineering, and/or administrative controls are not feasible. Employees must be trained on the proper use and care of PPE. Faculty and Staff should consult the department SOPs, manufacturer SDS documents, area supervisor or the District Risk Management Officer to determine the correct PPE for the chemical or process. Types of PPE include:

1) Eye and Face Protection

- Eye protection is worn any time chemicals are used as required under Administrative Procedures (AP) 6800 [AP 6800 Safety](#)
- Safety goggles to protect the user from chemical splashes and provide impact resistance as required by ANSI/ISEA Z87.1-2015 Eye & Face Protection Standards
- OSHA 1910.133 - Eye and Face Protection
[OSHA Eye and Face Protection](#)
- Cal/OSHA §3382. Eye and Face Protection
[Cal/OSHA Eye and Face Protection](#)
- Face shields: protect the user's face and neck from chemicals or particles

2) Skin Protection

- Protective apparel can safeguard the user from hazardous materials absorbing or causing damage to the skin
- Laboratory coats, closed-toed shoes, long-sleeved shirts, full-length trousers, and chemical splash aprons offer great skin protection
- Gloves should be worn whenever it is necessary to handle corrosive material, sharp-edged objects, very hot or very cold materials, or toxic chemicals. The following criteria should be considered when using gloves
 - Gloves should be selected depending on the type of chemical used
 - Gloves should be inspected for discoloration, punctures, and tears
 - Information should be obtained from manufacturers to determine safe limits
 - Consult District Risk Management for glove-type usage

3) Respiratory Protection

- Air purifying half-face or full-face supplied air respirators (airline or self-contained breathing apparatus (SCBA) are used when necessary to maintain exposure below the PEL

- Employees may only use respirators if they have been trained, fit-tested, examined by a physician, and authorized by the District Risk Management Officer. Respirators shall be selected and used in accordance with CCR § 5144
- SCBA respirators should be inspected at each use or monthly if not in use (CCR § 5144)
- Refer to the District's Respiratory Protection Program for more details: [Respiratory Protection Program 10 2019](#)

4) Hearing Protection

- Earplugs and earmuffs help protect the user from elevated noise that can damage hearing

J. Refrigerators

Individuals and/or departments purchasing refrigerators for laboratory use are expected to follow District procedures that are in accordance with requirements of NFPA 45. If flammable solvents need to be refrigerated, an explosion-safe refrigerator must be purchased. Explosion-safe/proof refrigerators are designed to eliminate the ignition of flammable vapors inside the storage compartment. A domestic refrigerator must not be used to store flammables because they contain ignition sources that can set off explosive concentrations of a flammable vapor. Vapors from a leaky stopper or a cracked container can build up to explosive concentrations and be ignited by the light switch or a thermostat. Domestic refrigerators located in labs must be labeled; ***“Do Not Store Flammables in this Refrigerator”***.

K. Signs and Labels

To ensure safety and reduce exposure in the laboratory, appropriate warnings should be provided. Signs and labels should include the following:

- 1) Emergency information & important telephone numbers
- 2) Locations of eyewash areas, shower areas, first aid equipment, fire extinguishers, emergency exits and Automated External Defibrillator (AED) units, if available
- 3) Hazard Warnings should be posted for flammable storage, oxidizer storage, corrosives storage, toxic storage, radioactive, biohazardous waste, extremely hot/cold equipment
- 4) Miscellaneous: SDS symbol meaning, proper lab attire, appropriate lab behavior, eye protection required, no food or beverage consumption, no smoking, no open flame
- 5) Containers:
 - Labels on incoming containers should not be removed
 - Chemical containers should be labeled with, at minimum, the chemical identity or contents, hazard warnings, date the chemical was received or prepared
 - Carcinogens should be clearly labeled
 - Hazardous waste containers should be labeled “Hazardous Waste” with the waste type identified and accumulation date on the container. Refer to the District's Waste Management Program for details.

XI. Accidents, Spills, and Emergencies

A spill refers to the release of hazardous material to an undesired location, resulting in increased hazard or potential hazards to people, property, and/or the environment. When a spill occurs or is discovered, appropriate action for the circumstances must be initiated. Laboratory specific spills

and accident SOPs may be created within the District and submitted for approval to the District Risk Management Officer.

A. Spill Plans and Spill Kits

The CHO should develop a spill plan appropriate for each department's chemical exposures. Start by reviewing the chemical inventory list to identify hazards of chemicals used and stored in their building or area. Purchase or assemble spill kit(s) appropriate for the chemicals used and stored in each area. Consider special needs for air and water reactive reagents, bases, corrosives, poisons, and toxic chemicals. Post emergency contact information or call lists at a central location(s) within the building. Post a hazardous materials spill guide at an easily accessible location in the work area. Train lab occupants on area spill procedures and exit routes. Review and update plan as needed.

Spill kit supplies may be purchased from district Procurement approved vendors. It is important to audit the spill kits regularly and replace used or expired items. A basic spill kit should include the following:

- Chemical resistant container(s)
- Dust pan and whisk broom
- Hazardous waste labels
- PPE
 - Goggles, gloves, face shields, shoe covers or boots, disposable apron or coverall
- Universal absorbents
- Specialty items (as needed based on chemical inventory)
 - General neutralizing agents for acids, bases, solvents, and formaldehyde
 - Mercury (Hg) collection sponges
 - Specialized supplies for air or water reactive chemicals and hydrofluoric acid

B. Spill Clean-up Procedures

Cleanup of a chemical spill should only be done by knowledgeable and experienced Faculty and Staff who have reviewed the SDSs for the spilled chemical(s). A minor chemical spill is one that the lab staff is capable of handling safely without the use of spill suits, protective clothing, and respirators. Also, a minor chemical spill is when the material is contained within a small area of the lab, preparation area, storage rooms or adjacent areas. Total volume of spilled material should be less than five gallons (<5 gal).

1) Standard Procedures for handling a Spill/Release of Chemicals/Hazardous Substances:

- Alert people in immediate area of spill
- Wear PPE, including safety goggles, gloves, and long-sleeved lab coat
- Avoid breathing vapors of spill
- Ventilate the area (i.e. turn on hoods) and shut hood sash if chemical is spilled inside a fume hood
- Contain the spill. If applicable, carefully place physical barriers around the spill to prevent further spreading of the spilled material (e.g. pads, rolls, socks, etc.). Gently apply absorbent materials from the outer edge of the spill and then inward.
- For solids, gently brush particles into a container or dustpan. If spilled material is not water reactive, wet wipe the area

- Use appropriate kit to neutralize and absorb inorganic acids and bases, solvents, etc.
- For other chemicals, use appropriate kit or absorb spill with vermiculite, dry sand, or diatomaceous earth. Collect residue, place in container, and dispose as chemical waste
- If debris may off gas, place the container in a chemical fume hood. Open the lid slightly to avoid pressure buildup or container rupture.
- Fill-in and apply a hazardous waste label to the collection's container and request container pickup
- Report spill to direct supervisor

2) Measures for handling Acid/Base Spills:

- PPE involved: goggles, gloves, disposable shoe covers
- Use sodium bicarbonate (NaHCO₃) or acid neutralizer absorbent for acid spills
- Use citric acid, sodium bisulfate or base neutralizer absorbent for base spills
- Vermiculite, spill pillows, or other absorbing material can be used to contain the spill
- Use pH paper to test the solution

3) Measures for handling Mercury (Hg) Spills:

- PPE involved: goggles, gloves, and disposable shoe covers
- For small spills, such as a 75mm Hg thermometer, use an aspirator bulb, suction device or mercury sponge
- If vapor inhalation is a potential problem, notify your supervisor for assistance

4) Measures for handling Acid Chloride Spills:

- Avoid water and sodium bicarbonate
- Use dry sand, Oil-Dri absorbent, or equivalent product

5) Measures for handling Alkali Metal Spills:

- Do not use water
- Smother in dry sand and place debris in a hood

6) Measures for handling Highly Hazardous or Toxic Material Spills:

- Select substances (i.e. hydrofluoric acid or extremely poisonous substances) may necessitate having special clean up supplies or antidotes in the work area. Refer to product SDS for guidance or contact the District Risk Management Officer.

7) Contact the College Police and the District's approved Restoration Contractor below for assistance after Facilities business hours (4:30PM) or on Saturday. During business hours, contact Facilities at X6875 and also call College Police at X6911.

- ATI (American Technologies Inc.) 1-800-400-9353 (24 Hour Emergency Services)
www.ATIrestoration.com

C. Emergencies, Major Spills/Accidents Procedures

- 1) Any Emergency: Call College Police emergency line at X6911 immediately.

After calling in emergency, notify your direct supervisor. Emergencies may include ambulance, evacuation, explosion, fire, police, rescue, etc.

2) Major Spill: Call College Police emergency line at X6911 immediately.

A major spill is one that spreads rapidly, presents inhalation or fire hazards, has entered the environment, or exceeds the capability of the user to respond. Steps to follow in the event of a major spill, after College Police is called at X6911:

- Attend to injured or contaminated individuals after donning the appropriate PPE and remove them from the exposure
- Alert others to leave spill area and close doors to affected area(s)
- Remove ignition sources, shut down equipment, close fume hood sash and open windows, as appropriate
- Assemble at a safe distance and location from exposure
- Provide necessary information and SDS documents to emergency Faculty and Staff and affected individuals
- Call supervisor to report an incident
- The CHO will complete the Environmental Release or Spill Incident Reporting Form (Appendix D) page 42

3) Minor Spill/Non-emergency situation:

Notify direct supervisor and follow spill procedures given above.

4) Environmental Release and Oil Spill Notifications:

For suspected or known spills to the environment (air, water, lands, and drains) during normal business hours, notify Facilities at X6875 or the District Risk Management Officer at (X6866). In addition, employees must follow the District's Spill Prevention, Control, and Countermeasure Plan (SPCC) written by the CHO and report spills to the CHO. These plans are maintained by the Facilities Department. For suspected or known spills to the environment that occur after hours, call College Police.

All significant spills or threatened releases of hazardous materials, including oil and radioactive materials, **must be immediately** reported. Notification shall be made by telephone. **Cal OES State Warning Center (800)852 - 7550 or (916) 845 - 8911**
The CHO will complete the Environmental Release or Spill Incident Reporting Form (Appendix D page 41) to assist in reporting the release/spill incident to Cal/OSHA.

California Hazardous Materials Spill / Release Notification Guidance
[California Hazardous Materials Spill / Release Notification Guidance](#)

5) Evacuation or Rescue:

Call College Police emergency line at X6911 immediately, then notify your supervisor. Supervisor should notify the District Risk Management Officer at X6866 immediately.

6) Explosion and Fire

- **General Response Actions:** Alert other Faculty and Staff in the lab or work area immediately and notify College Police. Quickly determine if means are available to extinguish fire. If none are available, then vacate the area and activate the nearest building fire alarm.
- **Small Fire Actions:** Relatively small fires (no larger than an office waste basket), may be extinguished immediately using the nearest fire extinguisher appropriate for the type of fuel burning. Fire extinguishers should be used only by individuals trained in the extinguisher operation. When using a fire extinguisher, aim the nozzle at base of fire and apply agent on flame using a side-to-side sweeping motion. Always maintain accessible exit and avoid smoke or fumes. Ventilate the area after the fire has been extinguished. Call College Police and report incident to your direct supervisor.

The four classes of extinguishers are:

Class A: ordinary combustible solids such as paper, wood, coal, rubber, and textiles

Class B: petroleum hydrocarbons (e.g. diesel fuel, motor oil, and grease)

Class C: electrical equipment

Class D: combustible or reactive metals (e.g. sodium, potassium, metal hydrides, and organometallics)

- **Large Fire Actions:** If a large fire erupts, activate the nearest fire alarm and alert people to evacuate. Close doors to confine fire. Evacuate the building immediately, then call College Police emergency line at 760-795-6640 from outside of the emergency area. Meet emergency Faculty and Staff outside with an individual knowledgeable of the incident to relay information. Only the fire department or College Police may authorize re-entry to the area.

7) Medical Treatment Needs: For emergency medical needs, contact College Police at X6911 to coordinate an immediate response.

The local emergency room for;

The San Elijo Campus- Faculty and Staff:

- Scripps Memorial Hospital Encinitas, 354 Santa Fe Drive, Encinitas, CA 92024
Main Phone Number: 760-633-6501

The Oceanside Campus- Faculty and Staff:

- Oceanside Tri-City Medical Center 4002 Vista Way, Oceanside, CA 92056
Main Phone Number: 760-724-8411

If vehicle transport is needed, College Police will request an ambulance.

For non-emergency work-related medical needs, employees may initiate a Workers' Compensation claim and seek medical attention at a local medical network provider. To initiate a claim, complete a District Workers' Compensation form found at;
<https://www.miracosta.edu/hr/riskmanagement/workers-comp.html>

8) Injury:

If an injured person needs immediate medical attention, yell out loud for help and initiate lifesaving measures (CPR/first aid). Call College Police emergency line at X6911.

If non-emergency injury, render assistance to the individual(s) involved then notify College Police and area supervisor. If other non-injured individuals are present, assign someone to call College Police for assistance and notify the area supervisor while you render assistance to the injured person(s).

Do not move an injured individual unless there is danger of further harm. Complete an Employee Report of Work Injury as noted above or contact Health Services for Student Accident Incident Report after injured individual has been tended to.

The following form can gather important information for minor laboratory incidents (first aid, Band Aids, minor burns, small cuts, etc.):

[Student Accident Reporting Form](#)

Complete and send copies to Risk Management, CHO, Area Dean, and the Department Chair.

When hazardous materials are involved:

- If further exposure is life threatening, then remove the injured from the affected area
- If chemicals are involved, wash the individual under the deluge shower or eyewash
- Flush body and/or eyes with water for at least 15 minutes
- Remove contaminated clothing while under deluge shower
- Do not use neutralizing agents, creams, lotions, or ointments
- Send an individual knowledgeable of the incident for help
- Notify College Police and provide exact location, type of injury, and number of individuals injured

9) Power Outages

A power outage may occur during lab operations, so it's important that employees learn about the emergency plans that have been established by the college. Some buildings are equipped with generators to sustain specific lights and outlets during an outage. Consider a plan for lab computers, instruments, refrigerators/freezers and specialized equipment that are power dependent and could be damaged during an outage or momentary power "surge". Consider adding surge protectors to these valuable devices. Departments may also purchase or make an emergency kit with supplies such as flashlights and batteries.

- General Response Actions:
 - Remain calm and contact College Police from a landline or cellular phone.
 - Place lids on open containers of volatile chemicals
 - Lower the sash on chemical fume hoods
 - Turn off ignition sources (e.g. gas lines)
 - Shut down equipment
 - Secure or isolate reactions that are underway (e.g. boiling liquids or distillations)

- After a Power Outage:
 - Throw away any food that has been exposed to temperatures above 40°F (4°C) for 2 hours or more or that has an unusual odor, color, or texture. When in doubt, throw it out.
 - Restock your emergency kit with fresh batteries and other supplies

10) Radioactive Material:

Notify your supervisor, the CHO, and the District Risk Management Officer of all radioactive material spills and instances of personal contamination as soon as possible.

D. Spill Training & Spill Minimization

1) Spill training criteria. Spill training should include the following:

- Recognition (sight, smell, alarms, etc.)
- Fire aid for chemical injuries that may occur in your area
- Handling emergencies (notification, action)
- Prevention and containment (secondary containment, spill limitation)
- Clean-up (PPE, use of equipment, preventing damages, etc.)
- Packing and handling of residue

2) Spill minimization. Spills can be minimized using the following techniques:

- Store hazardous liquid containers in a secondary pan or tray that is big enough to hold the contents if the primary container breaks or leaks
- Buy liquid chemicals in plastic coated bottles, especially concentrated acids
- Use bottle carriers for protection and containment
- Put pans under experiments
- Use traps on vacuum lines
- Use carts designed to prevent materials from sliding off the cart
- Have sink stoppers and drain covers handy to prevent material from entering drains

XII. Injury and Illness Reporting

A. IIPP Reporting

1) If an employee sustains an injury or illness during the performance of their work, the following reporting measures shall occur:

- Employees must immediately report any hazardous exposure incident to their supervisor, including all known or suspected injuries and illnesses. This can be done in-person or by phone call.
- Employees should complete the Employee's Report of Work Injury/Illness form and submit to their supervisor within 24 hours from time of incident. The completed form will be forwarded to District Risk Management Officer at MS6 immediately.
- Supervisors shall investigate all work-related illnesses and injuries and shall use the Supervisor's Accident Investigation Report form to report and document such incidents. The completed form will be submitted to the District Risk Management Officer within 24 hours from time of incident or knowledge thereof.

- Supervisors shall immediately notify the District Risk Management Officer regarding any work-related accident/incident that results in injury/illness to an employee. This can be done in-person at Location T116, by phone call to Risk Management X6866 or by email to jmazza@miracosta.edu .

APPENDIX A: LABORATORY SAFETY CHECKLIST



LABORATORY SAFETY CHECKLIST

| INSPECTOR INFORMATION | | | |
|-----------------------|----------------------------------|--|--|
| Inspector Name: | Click or tap here to enter text. | Dept :Click or tap here to enter text. | |
| Position Title: | Click or tap here to enter text. | Email/Phone:Click or tap here to enter text. | |
| | | | |

| ROOMS SURVEYED & MAIN CONTACT | | | |
|----------------------------------|----------------------------------|--------------|----------------------------------|
| List of Rooms in survey: | Click or tap here to enter text. | | |
| Date of Survey: | Click or tap here to enter text. | Time: | Click or tap here to enter text. |
| Lab Contact: | Click or tap here to enter text. | Dept.: | Click or tap here to enter text. |
| Position Title: | Click or tap here to enter text. | Email/Phone: | Click or tap here to enter text. |
| Name & Title of Area Supervisor: | Click or tap here to enter text. | | |

| INSTRUCTIONS |
|--|
| Review the following lists and note any hazard found in the room(s) surveyed. Give details or add comments in space provided. If any major hazard or dangerous condition is identified during the inspection, you must notify the area supervisor immediately. Otherwise, submit the completed checklist to area supervisor within 48 hours of inspection. |

| LIST OF POSSIBLE HAZARDS | Y | N | N/A | COMMENTS |
|--|--------------------------|--------------------------|--------------------------|----------------------------------|
| 1) BSL-2 (or +) activities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 2) Field work using hazardous chemicals | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 3) Open flames | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 4) Overnight reactions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 5) Ship hazardous materials | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 6) Use of aggressive glassware cleaning baths (acid or base) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 7) Use of aqua regia or piranha solution | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |

| | | | | |
|---|--------------------------|--------------------------|--------------------------|----------------------------------|
| 8) Use of oven at 450°C or above | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 9) Use of Schlenk lines (vacuum gas manifold) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 10) Use of Solvent stills | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 11) Use of Compressed gases | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 12) Use of Prop 65 chemicals | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 13) Use of carcinogens, teratogens, mutagens | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 14) Use of Hot oil bath | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |

| ADMINISTRATIVE PLANS & PROCEDURES | Y | N | N/A | COMMENTS |
|--|--------------------------|--------------------------|--------------------------|----------------------------------|
| 15) Emergency procedures posted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 16) Chemical Hygiene Plan, Waste Management & other lab-related safety programs accessible to all lab Faculty and Staff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 17) Lab Faculty and Staff are knowledgeable on how and when to report accidents, incidents, or near-misses to supervisor and District | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 18) Lab-specific information included in area Lab Safety Manual and/or SOPs | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 19) Lab Safety Manual and/or SOPs accessible to all lab Faculty and Staff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 20) Safety Data Sheets (SDS) accessible to all lab Faculty and Staff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 21) Was a safety self-audit performed within the last 12 months? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| BIOLOGICAL SAFETY | Y | N | N/A | COMMENTS |
| 22) Lab works with biohazards involving recombinant DNA, human or non-human primate material, or pathogenic agents, have a Biological Use Authorization | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 23) If conducting BSL1/ABSL1 practices or higher - sink available for hand washing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 24) Biohazardous blades, needles, and other sharps promptly disposed of in a designated sharps container | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| CHEMICAL STORAGE/PROCESS | Y | N | N/A | COMMENTS |
| 26) Hazardous material quantities are within limits allowed by Fire Code | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 27) Flammable liquids that are stored in a refrigerator are stored in an approved flammable (or explosive) liquids fridge | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 28) Flammable liquids that are stored outside of flammable storage cabinets are limited to 10 gallons in quantity and are stored in approved safety containers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |

| | | | | |
|---|--------------------------|--------------------------|--------------------------|----------------------------------|
| 29) All chemical containers in good condition (not corroded, cracked or leaking) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 30) All chemical containers closed properly | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 31) Incompatible chemicals segregated when being stored | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 32) Hazardous materials storage cabinets properly labeled and in good condition | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 33) Chemicals stored on the floor in DOT approved carboys, metal containers or glass containers provided with secondary containment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 34) All secondary containment is properly labeled and in good condition | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 35) Chemical containers being stored away from sinks | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 36) Corrosive chemicals are stored below eye level | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 37) Chemical containers stored safely on shelves with lips or in a closed cabinet to prevent them from falling in an earthquake | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 38) Opened peroxide forming compounds are labeled with the date they were opened and an expiration date | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 39) Lab is free of chemicals that are expired, old or no longer needed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| COMPRESSED GASES/CRYOGENS | Y | N | N/A | COMMENTS |
| 40) All highly toxic gas cylinders are stored in a gas cabinet, ventilated enclosure, or fume hood | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 41) Incompatible compressed gas cylinders are segregated | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 42) Gas cylinder valve protection caps in place for all cylinders not in active use | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 43) Compressed gas cylinders secured to prevent from falling or tipping | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| ELECTRICAL SAFETY | Y | N | N/A | COMMENTS |
| 44) Building electrical panels accessible | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 45) Extension cords or power strips are not daisy-chained to each other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 46) Lab has no exposed wiring or electrical cords in poor condition | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 47) Ground fault circuit interrupters (GFCIs – either fixed GFCI receptacles/breakers or using adaptors) employed in wet locations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 48) Extension cords used as temporary wiring and do not run under carpets, doors or through walls/ceilings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 49) Equipment with motors, heaters and other amperage are plugged directly into a wall receptacle | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| EMERGENCY EYEWASH/DELUGE SHOWER | Y | N | N/A | COMMENTS |

| | | | | |
|--|--------------------------|--------------------------|--------------------------|----------------------------------|
| 50) Eyewashes & showers accessible within 10 seconds travel | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 51) Eyewashes & showers free of obstructions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 52) Eyewashes routinely flushed & record kept | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| EMERGENCY KITS | Y | N | N/A | COMMENTS |
| 53) Lab has access to chemical and/or biological spill kits | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 54) Lab staff have access to a fully stocked first-aid kit & training on first aid | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| EXIT ACCESS/CORRIDORS | Y | N | N/A | COMMENTS |
| 55) Aisles and exits within the lab space are free of clutter and obstructions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 56) Corridors and exits free of obstruction and hazardous materials | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| FIRE SAFETY | Y | N | N/A | COMMENTS |
| 57) 18 inches clearance between stored items and ceiling and fire sprinklers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 58) Suspended or dropped ceiling have all ceiling tiles in place | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 59) Lab doors kept closed when unoccupied | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 60) Fire extinguishers available, easily accessible, and free of obstructions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 61) Fire extinguishers checked regularly and at least annually | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| FOOD/BEVERAGE | Y | N | N/A | COMMENTS |
| 62) Food and drink are prohibited in lab areas | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| HAZARD COMMUNICATION | Y | N | N/A | COMMENTS |
| 63) Chemical inventory for lab has been reviewed and updated within last year | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 64) Lab's contact information is current on college website | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 65) Lab staff can readily access SDS either from hard copies or digitally | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 66) All containers clearly labeled with contents and primary hazard(s) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| HOUSEKEEPING | Y | N | N/A | COMMENTS |
| 67) Lab is free of slip and trip hazards | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 68) Lab is adequately organized, orderly and clean to provide sufficient work space for operations without spills, accidents and other preventable incidents | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 69) Minimal glassware stored in the sink or on bench tops | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |

| | | | | |
|--|--------------------------|--------------------------|--------------------------|----------------------------------|
| 70) Lab coats are regularly laundered | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| MACHINERY | Y | N | N/A | COMMENTS |
| 71) All hazardous pieces of machinery are mounted or secured to prevent movement or tipping | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 72) All points of operation, rotating components, and other moving parts of machinery are properly guarded to prevent injury | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 73) Lab equipment with potential hazards are routinely inspected and maintained or services as recommended by manufacturer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| PERSONAL PROTECTIVE EQUIPMENT | Y | N | N/A | COMMENTS |
| 74) PPE hazard assessment completed for all lab Faculty and Staff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 75) PPE safety training completed by all applicable lab Faculty and Staff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 76) Applicable PPE assigned to all Faculty and Staff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 77) If respirators are being used, Faculty and Staff have passed fit test on assigned PPE | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 78) If respirators are being used, Faculty and Staff have completed Respiratory Protection training within the last year. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 79) If respirators are being used, Faculty and Staff have completed pulmonary medical clearance within last 3 years | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| SIGNAGE | Y | N | N/A | COMMENTS |
| 80) Emergency contact numbers for lab staff, including after-hours contacts are posted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 81) "In Case of Injury/Illness" info. posted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 82) Lab hazard caution sign posted & current | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 83) Biosafety door sign posted when agents are in use and removed when not in use | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 84) Additional hazard warning signs (laser, magnetic fields, high voltage, etc.) posted in lab near the hazard | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 85) Lab floor plan posted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 86) Exit signs posted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 87) "No food/drink" signs posted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 88) "Not an Exit" posted on lab doors that are not official Exit doors. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| TRAINING | Y | N | N/A | COMMENTS |
| 89) Safety training assessment has been completed for lab Faculty and Staff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |

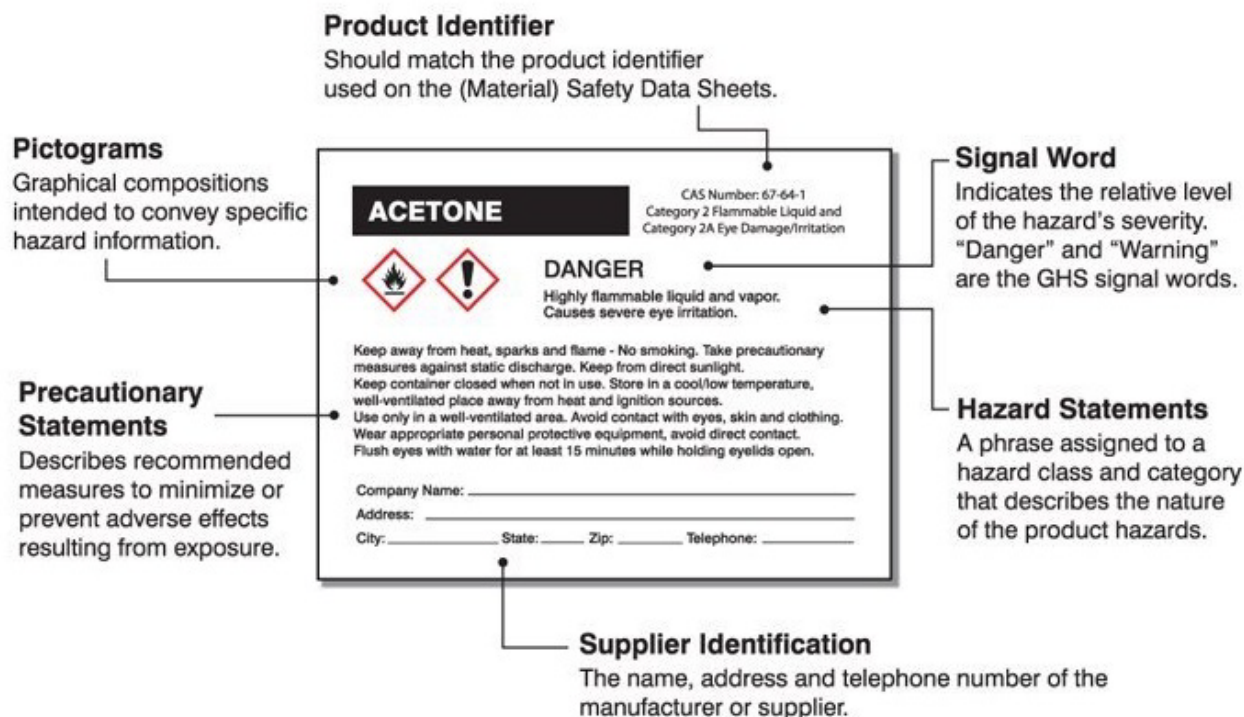
| | | | | |
|--|--------------------------|--------------------------|--------------------------|----------------------------------|
| 90) Safety training completed and documented for all lab staff, including chemical/biological spills overview | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 91) Lab specific training completed and documented | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| VENTILATION | Y | N | N/A | COMMENTS |
| 92) Processes that emit vapors, gases, or fumes are adequately captured by local ventilation (hood, snorkel, etc.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 93) Fume hoods kept uncluttered and rear ventilation slots are not blocked/covered | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 94) Fume hoods properly labeled "Out of Service" when in need of repair | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 95) Fume hood certification completed within last year and posted on each hood | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| WASTE & DISPOSAL | Y | N | N/A | COMMENTS |
| 96) Waste containers in good condition and compatible with their contents | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 97) Waste containers are kept closed when not in use | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 98) Incompatible chemical wastes are segregated by hazard class | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 99) All waste containers are labeled with accumulation start date, contents, source department, hazard(s), | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 100) All waste containers have accumulation start dates that are less than 90 days old | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 101) Lab glass placed in sturdy cardboard boxes that are labeled properly for disposal | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 102) Sharps waste containers properly labeled | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| 103) Biological waste containers properly labeled | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Click or tap here to enter text. |
| INSPECTION FOLLOW-UP INFORMATION | | | | |
| Date submitted to supervisor:Click or tap here to enter text. | | | | |
| Corrective Action Plan (if applicable):Click or tap here to enter text. | | | | |
| Date & details of items corrected:Click or tap here to enter text. | | | | |

APPENDIX B: SAMPLE CONTAINER LABEL

The illustration below identifies the components of a GHS label as described in Section VII of this plan. The GHS hazard pictograms, signal word and hazard statements should be located together on the label. Actual label design and layout may vary and are subject to the discretion of the competent authority.










GHS

Label:



GHS

Pictograms:

| | | | | | |
|---|--|---|---|---|---|
|  | Exploding bomb (for explosion or reactivity hazards) |  | Flame (for fire hazards) |  | Flame over circle (for oxidizing hazards) |
|  | Gas cylinder (for gases under pressure) |  | Corrosion (for corrosive damage to metals, as well as skin, eyes) |  | Skull and Crossbones (can cause death or toxicity with short exposure to small amounts) |
|  | Health hazard (may cause or suspected of causing serious health effects) |  | Exclamation mark (may cause less serious health effects or damage the ozone layer*) |  | Environment* (may cause damage to the aquatic environment) |

APPENDIX C: Cal/OSHA List of Acutely Hazardous Chemicals, Toxics and Reactives

The following contains a listing of toxic and reactive highly hazardous chemicals which present a potential for a catastrophic event at or above the threshold quantity (TQ).

<https://www.dir.ca.gov/title8/5189a.html>

| CHEMICAL NAME | CAS* | TQ** |
|--|------------|-------|
| Acetaldehyde | 75-07-0 | 2500 |
| Acrolein (2-Propenal) | 107-02-8 | 150 |
| Acrylyl Chloride | 814-68-6 | 250 |
| Allyl Chloride | 107-05-1 | 1000 |
| Allylamine | 107-11-9 | 1000 |
| Alkylaluminums | Varies | 5000 |
| Ammonia, Anhydrous | 7664-41-7 | 10000 |
| Ammonia solutions (>44% ammonia by weight) | 7664-41-7 | 15000 |
| Ammonium Perchlorate | 7790-98-9 | 7500 |
| Ammonium Permanganate | 7787-36-2 | 7500 |
| Arsine (also called Arsenic Hydride) | 7784-42-1 | 100 |
| Bis(Chloromethyl) Ether | 542-88-1 | 100 |
| Boron Trichloride | 10294-34-5 | 2500 |
| Boron Trifluoride | 7637-07-2 | 250 |
| Bromine | 7726-95-6 | 1500 |
| Bromine Chloride | 13863-41-7 | 1500 |
| Bromine Pentafluoride | 7789-30-2 | 2500 |
| Bromine Trifluoride | 7787-71-5 | 15000 |
| 3-Bromopropyne (also called Propargyl Bromide) | 106-96-7 | 100 |
| Butyl Hydroperoxide (Tertiary) | 75-91-2 | 5000 |
| Butyl Perbenzoate (Tertiary) | 614-45-9 | 7500 |
| Carbonyl Chloride (see Phosgene) | 75-44-5 | 100 |
| Carbonyl Fluoride | 353-50-4 | 2500 |
| Cellulose Nitrate (concentration >12.6% nitrogen) | 9004-70-0 | 2500 |
| Chlorine | 7782-50-5 | 1500 |
| Chlorine Dioxide | 10049-04-4 | 1000 |
| Chlorine Pentafluoride | 13637-63-3 | 1000 |
| Chlorine Trifluoride | 7790-91-2 | 1000 |
| Chlorodiethylaluminum (also called Diethylaluminum Chloride) | 96-10-6 | 5000 |
| 1-Chloro-2,4-Dinitrobenzene | 97-00-7 | 5000 |
| Chloromethyl Methyl Ether | 107-30-2 | 500 |
| Chloropicrin | 76-06-2 | 500 |
| Chloropicrin and Methyl Bromide mixture | None | 1500 |
| Chloropicrin and Methyl Chloride mixture | None | 1500 |
| Cumene Hydroperoxide | 80-15-9 | 5000 |
| Cyanogen | 460-19-5 | 2500 |
| Cyanogen Chloride | 506-77-4 | 500 |
| Cyanuric Fluoride | 675-14-9 | 100 |
| Diacetyl Peroxide (Concentration >70%) | 110-22-5 | 5000 |
| Diazomethane | 334-88-3 | 500 |
| Dibenzoyl Peroxide | 94-36-0 | 7500 |
| Diborane | 19287-45-7 | 100 |
| Dibutyl Peroxide (Tertiary) | 110-05-4 | 5000 |

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| Dichloro Acetylene | 7572-29-4 | 250 |
| Dichlorosilane | 4109-96-0 | 2500 |
| Diethylzinc | 557-20-0 | 10000 |
| Diisopropyl Peroxydicarbonate | 105-64-6 | 7500 |
| Dilaluroyl Peroxide | 105-74-8 | 7500 |
| Dimethyldichlorosilane | 75-78-5 | 1000 |
| Dimethylhydrazine, 1,1- | 57-14-7 | 1000 |
| Dimethylamine, Anhydrous | 124-40-3 | 2500 |
| 2,4-Dinitroaniline | 97-02-9 | 5000 |
| Ethyl Methyl Ketone Peroxide (also Methyl Ethyl Ketone Peroxide; concentration >60%) | 1338-23-4 | 5000 |
| Ethyl Nitrite | 109-95-5 | 5000 |
| Ethylamine | 75-04-7 | 7500 |
| Ethylene Fluorohydrin | 371-62-0 | 100 |
| Ethylene Oxide | 75-21-8 | 5000 |
| Ethyleneimine | 151-56-4 | 1000 |
| Fluorine | 7782-41-4 | 1000 |
| Formaldehyde (Formalin) | 50-00-0 | 1000 |
| Furan | 110-00-9 | 500 |
| Hexafluoroacetone | 684-16-2 | 5000 |
| Hydrochloric Acid, Anhydrous | 7647-01-0 | 5000 |
| Hydrofluoric Acid, Anhydrous | 7664-39-3 | 1000 |
| Hydrogen Bromide | 10035-10-6 | 5000 |
| Hydrogen Chloride | 7647-01-0 | 5000 |
| Hydrogen Cyanide, Anhydrous | 74-90-8 | 1000 |
| Hydrogen Fluoride | 7664-39-3 | 1000 |
| Hydrogen Peroxide (52% by weight or greater) | 7722-84-1 | 7500 |
| Hydrogen Selenide | 7783-07-5 | 150 |
| Hydrogen Sulfide | 7783-06-4 | 1500 |
| Hydroxylamine | 7803-49-8 | 2500 |
| Iron, Pentacarbonyl | 13463-40-6 | 250 |
| Isopropylamine | 75-31-0 | 5000 |
| Ketene | 463-51-4 | 100 |
| Methacrylaldehyde | 78-85-3 | 1000 |
| Methacryloyl Chloride | 920-46-7 | 150 |
| Methacryloyloxyethyl Isocyanate | 30674-80-7 | 100 |
| Methyl Acrylonitrile | 126-98-7 | 250 |
| Methylamine, Anhydrous | 74-89-5 | 1000 |
| Methyl Bromide | 74-83-9 | 2500 |
| Methyl Chloride | 74-87-3 | 15000 |
| Methyl Chloroformate | 79-22-1 | 500 |
| Methyl Ethyl Ketone Peroxide (concentration >60%) | 1338-23-4 | 5000 |
| Methyl Fluoroacetate | 453-18-9 | 100 |
| Methyl Fluorosulfate | 421-20-5 | 100 |
| Methyl Hydrazine | 60-34-4 | 100 |
| Methyl Iodide | 74-88-4 | 7500 |
| Methyl Isocyanate | 624-83-9 | 250 |
| Methyl Mercaptan | 74-93-1 | 5000 |
| Methyl Vinyl Ketone | 78-94-4 | 100 |
| Methyltrichlorosilane | 75-79-6 | 500 |
| Nickel Carbonyl (Nickel Tetracarbonyl) | 13463-39-3 | 150 |

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| Nitric Acid (94.5% by weight or greater) | 7697-37-2 | 500 |
| Nitric Oxide | 10102-43-9 | 250 |
| Nitroaniline (para Nitroaniline) | 100-01-6 | 5000 |
| Nitromethane | 75-52-5 | 2500 |
| Nitrogen Dioxide | 10102-44-0 | 250 |
| Nitrogen Oxides (NO; NO ₂ ; N ₂ O ₄ ; N ₂ O ₃) | 10102-44-0 | 250 |
| Nitrogen Tetroxide (also called Nitrogen Peroxide) | 10544-72-6 | 250 |
| Nitrogen Trifluoride | 7783-54-2 | 5000 |
| Nitrogen Trioxide | 10544-73-7 | 250 |
| Oleum (65% to 80% by weight; also called Fuming Sulfuric Acid) | 8014-95-7 | 1,000 |
| Osmium Tetroxide | 20816-12-0 | 100 |
| Oxygen Difluoride (Fluorine Monoxide) | 7783-41-7 | 100 |
| Ozone | 10028-15-6 | 100 |
| Pentaborane | 19624-22-7 | 100 |
| Peracetic Acid (concentration >60% Acetic Acid; also called Peroxyacetic Acid) | 79-21-0 | 1000 |
| Perchloric Acid (concentration >60% by weight) | 7601-90-3 | 5000 |
| Perchloromethyl Mercaptan | 594-42-3 | 150 |
| Perchloryl Fluoride | 7616-94-6 | 5000 |
| Peroxyacetic Acid (concentration >60% Acetic Acid; also called Peracetic Acid) | 79-21-0 | 1000 |
| Phosgene (also called Carbonyl Chloride) | 75-44-5 | 100 |
| Phosphine (Hydrogen Phosphide) | 7803-51-2 | 100 |
| Phosphorus Oxychloride (also called Phosphoryl Chloride) | 10025-87-3 | 1000 |
| Phosphorus Trichloride | 7719-12-2 | 1000 |
| Phosphoryl Chloride (also called Phosphorus Oxychloride) | 10025-87-3 | 1000 |
| Propargyl Bromide | 106-96-7 | 100 |
| Propyl Nitrate | 627-3-4 | 2500 |
| Sarin | 107-44-8 | 100 |
| Selenium Hexafluoride | 7783-79-1 | 1000 |
| Stibine (Antimony Hydride) | 7803-52-3 | 500 |
| Sulfur Dioxide (liquid) | 7446-09-5 | 1000 |
| Sulfur Pentafluoride | 5714-22-7 | 250 |
| Sulfur Tetrafluoride | 7783-60-0 | 250 |
| Sulfur Trioxide (also called Sulfuric Anhydride) | 7446-11-9 | 1000 |
| Sulfuric Anhydride (also called Sulfur Trioxide) | 7446-11-9 | 1000 |
| Tellurium Hexafluoride | 7783-80-4 | 250 |
| Tetrafluoroethylene | 116-14-3 | 5000 |
| Tetrafluorohydrazine | 10036-47-2 | 5000 |
| Tetramethyl Lead | 75-74-1 | 1000 |
| Thionyl Chloride | 7719-09-7 | 250 |
| Trichloro (chloromethyl) Silane | 1558-25-4 | 100 |
| Trichloro (dichlorophenyl) Silane | 27137-85-5 | 2500 |
| Trichlorosilane | 10025-78-2 | 5000 |
| Trifluorochloroethylene | 79-38-9 | 10000 |
| Trimethoxysilane | 2487-90-3 | 1500 |

*Chemical Abstract Service Number.

**Threshold Quantity in Pounds (Amount necessary to be covered by this standard).

Note: Authority cited: Section 142.3, Labor Code. Reference: Sections 142.3 and 7856, Labor Code.

APPENDIX D: ENVIRONMENTAL RELEASE OR SPILL INCIDENT REPORTING FORM

[San Diego County Spills and Release Reporting](#)