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Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Minor Revision
02	10/09/2006	Minor Revision Rescind LAB-SAF-04
03	12/03/2010	New: LAB-SAF-07
04	05/17/2012	Rescind LAB-SAF-06
04a	08/22/2013	Changed from TOC to MDL
05	11/19/2013	Revised: SAF-01-06
05a	03/20/2017	Version numbers removed from MDL
06	05/01/2017	New LAB-SAF-08 Revise LAB-SAF-03, SAF-01-01, SAF-01-02, SAF-01-07, SAF-01-09, SAF-05-02, SAF-05-04, SAF-05-05 Rescind SAF-05-06, SAF-TM-01
07	08/01/2019	New: SAF-04-02, LAB-SAF-09, LAB-SAF-10 Revise: SAF-01-01, SAF-01-04, SAF-01-05, SAF-01-06, SAF-01-08, SAF-02-01, SAF-03-01, SAF-03-02, SAF-04-01, SAF-05-02, SAF-05-03, SAF-05-04, SAF-05-05, LAB-SAF-01 Rescind: SAF-01-03 Administrative Revision: SAF-01-02, SAF-01-07, SAF-01-09, SAF-06-01, LAB-SAF-02, LAB-SAF-03, LAB-SAF-07, LAB-SAF-08



GENERAL LABORATORY SAFETY

1 Scope

The Department has specific legal obligations to provide a safe working environment for its employees. Employees should be informed of: their right to know the dangers presented by chemicals that are being used in the workplace, safety data sheet (SDS) availability, and chemical labeling requirements.

DPS Laboratory personnel may be exposed to hazardous chemicals and to infectious diseases through contact with body fluid evidence and/or daily occupational exposures. It is necessary to use universal precautions, appropriate personal protective equipment (PPE), and proper handling techniques when dealing with items that have an unknown level of risk. Therefore, it is appropriate to consider unknown substances as a high risk for potential exposure to the employee and others in the laboratory.

Hazardous Substance is defined as any substance designated or listed under the Code of Federal Regulations 40 CFR 261.3 or 49 CFR 171.8, exposure to which results or may result in adverse effects on the health or safety of employees.

New employees shall not handle unknown substances until they have completed all sections of the Fundamentals Unit within the General Laboratory Training Manual.

2 Universal Precautions for Handling Unknown Substances

- A. All chemicals not labeled with a hazard label or readily identifiable should be handled as though they have health, flammability, reactivity, and contact hazard ratings of at least 3.
- B. Gloves composed of appropriate materials shall be worn to prevent contact with bare skin. Avoid handling common area items such as door knobs while wearing gloves that have been exposed to unknown substances or hazards.
- C. Appropriate eye protection shall be used when handling unknown substances.
- D. The employee should open containers in a manner to avoid exposure (such as spillage, aerosol, and release of material into the air). Use of a chemical fume hood and/or mask should be considered as a precautionary measure. When not in use, chemicals will be kept in a closed container.
- E. Chemical fume hoods must be operating as intended, while in use.
- F. Never attempt to identify a substance by taste or odor unless associated with an approved test method.
- G. Spills of chemicals/hazardous materials must be immediately cleaned. The use of the appropriate spill kit should be considered. The waste must be labeled as hazardous waste and handled accordingly.
- H. Wash hands after removing gloves, lab coats or other personal protective equipment and when leaving the work area.

3 Universal Precautions for Handling Blood and Other Potentially Infectious Materials

- A. Gloves composed of appropriate materials shall be worn to prevent contact with bare skin. Avoid handling common area items such as door knobs while wearing gloves that have been exposed to blood and other potentially infectious materials.



- B. Appropriate eye protection shall be used when handling blood and other potentially infectious materials.
- C. Organize and plan the use of procedures before beginning work. Always make sure all necessary safety materials are at hand, including a 10% household bleach solution or other appropriate disinfectant and paper towels nearby in the event of a minor spill.
- D. Perform procedures in a manner that will minimize exposure from splashing, spraying, spattering and generation of droplets. If a procedure may cause aerosols or droplets to form, then additional containment of the material should be considered such as in a biological safety cabinet.
- E. Human blood, tissue and other potentially infectious materials should be transported and packaged in a manner to avoid exposure and/or leakage.
- F. The outermost packaging must be appropriately labeled (see SAF-04-01 – Biological Pathogen Exposure Control).
- G. When possible, avoid the use of needles when working with potentially infectious materials.
- H. Use caution when handling needles. Do not remove needles from syringes by hand. If removal is necessary, use a hemostat, forceps, or sharps containers equipped with a needle-removing device. Recap syringes using a mechanical device or a one-handed technique and repackage them in syringe transport tubes.
- I. Properly dispose of non-evidentiary sharps into approved containers. Do not allow containers to overfill. Never reach inside or attempt to force items into a sharps container.
- J. Discard all non-sharp material potentially contaminated with biological substances into biohazard containers.
- K. Wash hands immediately after removing gloves, lab coats or other personal protective equipment and immediately before leaving the work area.

4 Practice

4.1 General Housekeeping

- A. Keep all aisles, hallways, and stairs clear of all chemicals.
- B. Keep all work areas and especially workbenches clear of clutter and obstructions.
- C. Floors shall be kept unobstructed, dry (except when mopping is needed at which point a sign should be placed warning others of slip hazards), and free from slippery materials. Walkways should be kept free of extension cords, hoses, etc.
- D. Decontaminate and clean work surfaces following completion of work.
- E. Emergency equipment, showers, eyewashes and exits shall be unobstructed and accessible.
- F. Routine maintenance of safety equipment should be performed as needed.
- G. Properly dispose of hazardous waste in appropriately labeled containers.
- H. All chemicals shall be labeled and stored properly.
- I. Drawers and cabinet doors should never be left open.



- J. Refrigerators shall be thoroughly cleaned with a disinfectant per section schedule or as necessary.
- K. Evidence receiving and storage areas will be maintained in a safe and clean condition.

4.2 Personal Hygiene

- A. Personal protective equipment (PPE) shall be used as appropriate.
- B. Wash hands thoroughly after handling evidence or chemicals.
- C. It is recommended that clothing worn in the laboratory be changed as soon as possible to limit exposure.
- D. Avoid inhalation of chemical fumes and dust.
- E. Mouth pipetting is prohibited.
- F. Do not use tobacco, eat, drink or apply cosmetics in the laboratory areas where evidence is handled and/or chemicals used. In addition, an effort shall be made by the employee to limit exposure of paperwork, notes, and other personal items (such as cell phones).
- G. Do not store food or drinks in refrigerators, freezers, cabinets or bench tops where blood or other potentially infectious materials may be present.



Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Modification Section 1 "...each employee should view the Laboratory Safety videos available in the Lab...." Modification Section 2 "...or otherwise hazardous to humans as well as chemicals.... " Modification Section 4.1 G, "...All chemicals should <u>shall</u> be labeled and stored properly (see Chemical Hygiene)." Deletion Section 4.1 K, regarding evidence handling areas. Modification Section 4.2 D, "...mechanical vapor detector test conducted <u>as necessary</u>" Deletion Section 4.3 C, regarding PPE.
02	10/09/2006	Minor Revision to Section 3 Responsibility for Laboratory Safety Advisor incorporating requirements for chemical hygiene officer Modification to Section 4.1D "...cleaned regularly <u>when necessary</u> ." Modification to Section 4.2 D "If suspicious <u>potentially hazardous</u> odors are noticed in the laboratory, the supervisor should be notified. <u>Refer to the Emergency Response Section (SAF-05) for additional information.</u> and a mechanical vapor detector test conducted as necessary, such as detector tubes or ionization meters, and respiratory protection. "
03	05/01/2017	Major Revision – All Sections; responsibilities moved to LOG-01-02
04	08/01/2019	Revision – All Sections



PERSONAL PROTECTIVE EQUIPMENT

1 Scope

Personal protective equipment, commonly referred to as “PPE”, is equipment worn to protect against workplace hazards. Most personal protective equipment is provided by Texas DPS Crime Laboratory to employees when and where necessary. It is the responsibility of each employee to be certain that the appropriate equipment is worn as necessary.

2 Protective Apparel and Equipment

A. Clothing

1. Appropriate clothing should be worn to minimize exposed skin surfaces. However, gowns, lab coats, aprons, or similar clothing shall be worn if there is a potential for soiling of clothes with blood or other potentially infectious materials.
2. Laboratory coats should be used as protection against dry chemicals and minor splashes.
3. Disposable Tyvek-type jumpsuits may be used as necessary to provide added protection from chemicals and biological hazards.
4. Laboratory aprons may be used in situations of potential splashing. Additionally, arm guards may be worn when using an apron.
5. Fire-retardant clothing may be worn as necessary.

B. Footwear

1. No open-toed shoes shall be worn in laboratory and evidence work areas.
2. Shoe covers may be worn if there is a potential for shoes to become contaminated and/or soaked with blood or other potentially infectious materials.

C. Gloves

1. Gloves should be worn when handling chemicals or other potentially hazardous evidentiary materials. Gloves must be of a material compatible with the chemicals and/or materials used. When in doubt, use the maximum protection available.
2. Gloves shall be worn when the employee has the potential for the hands to have direct skin contact with blood, other potentially infectious material, broken skin, and when handling items or surfaces soiled with blood or other potentially infectious materials.
3. Disposable (single use) gloves, such as surgical or examination gloves shall be replaced as soon as practical when visibly soiled or if the integrity of the glove is compromised. They shall not be washed or disinfected for re-use.
4. Utility gloves may be disinfected for re-use, however, they must be discarded if they are cracked, peeling, discolored, torn, punctured, or exhibit other signs of deterioration.



D. Face Protection

1. Masks and eye protection or chin-length face shields may be worn as necessary.
2. If a fume or biological hood is not used, appropriate protection shall be worn whenever splashes, spray, spatter, droplets, or aerosols of blood or other potentially infectious materials may be generated and there is a potential for eye, nose or mouth contamination.
3. Safety glasses should be used when mechanical, chemical, or radiation hazards to the eyes are present. Eyeglasses are not sufficient protection when using liquid chemicals. Safety glasses may be worn over prescription lenses.
4. Goggles should be used when working with liquid chemicals.
5. For more hazardous chemicals, corrosives, and hot chemicals, a face shield should be used. Goggles may also be used to protect the eyes in case splashing occurs from the side or beneath shield.
6. Dust or nuisance masks may be worn as necessary.

E. Hearing protection may be worn as necessary.

- F. Respiratory apparatus, cartridge-type or self-contained breathing apparatus, must be provided to protect employees against chemical inhalation with vapor concentrations above regulated levels.



Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Modification Section 2.1 C #3, "...glove is compromised, tear, punctured, or their ability to function as a barrier..." Modification Section 2.1 D #1, "If a <u>fume or biological</u> hood is not used..."
02	10/09/2006	Minor Revision
03	05/01/2017	Minor Revision – All Sections
03a	08/01/2019	Administrative Revision – Changed issuing authority to System Quality Manager



EYEWASHES AND SAFETY SHOWERS

1 Scope

Where the eyes or body of any person may be exposed to chemicals, blood, or other potentially infectious materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area.

Eyewashes and safety showers are considered a form of first aid equipment, but they are not a substitute for PPE, proper attire, and safe work procedures.

2 Practice

- A. Employees must be trained in the location and proper use of eyewashes and safety showers.
- B. All flushing equipment must be located in areas that are accessible and on the same level (even surface) as the hazard with the path of travel free from obstructions.
- C. The location of the eyewash and safety shower equipment must be visibly marked with appropriate signage.
- D. Plumbed eyewash and safety shower equipment shall be designed, manufactured and installed in such a manner that, once activated, can be used immediately without requiring the use of the operator's hands. Actuators for devices (the start chains, push paddles, etc.) shall be unobstructed and easy to locate.
- E. Units that combine an eye/face wash unit and a safety shower must be capable of simultaneous use.
- F. Protective eyewash covers shall be clean, intact, and come off easily when activated. Bowls shall be kept clean and cleared.
- G. Weekly activation should be performed to ensure that safety showers and eyewash stations are functioning and fit for use. This helps clear the supply lines of sediment and bacteria build-up that is caused from stagnant water.
- H. When the eyewashes and safety showers are checked, it shall be documented on the Safety Eyewash/Shower Checklist (LAB-SAF-09). These documents are archived annually with the final biannual safety inspection documentation.
- I. Criteria for inspection of function and availability of plumbed safety shower and eyewash stations:
 - 1. Visibility - All signs, labels or markings are legible, visible, and appropriate.
 - 2. Both the path(s) to and the area at the safety shower shall be free of obstructions.
- J. Safety Shower and Eyewash Instructions.
 - 1. Personnel assisting the affected employee should observe universal precautions and wear personal protective equipment if warranted.
 - 2. While using a safety shower, personnel shall quickly remove contaminated clothing because continued contact with the corrosive/toxic material in the clothing may cause skin burns.
 - 3. The affected eye(s) should remain open while flushing.



4. If there is still irritation on the skin after showering or irritation of eyes or vision loss after flushing the eyes, seek medical treatment and file an incident/accident report.

K. Incident/Accident Report

1. The appropriate incident and/or accident reports shall be completed when applicable (e.g. Quality Incident report, injury/illness (exposure), medical, etc.) and a copy sent to the DPS Workers' Compensation Office and the Health and Safety Manager within 24 hours.
2. The following information shall be documented:
 - a) *Name of all persons who may have been exposed*
 - b) *Identity of material*
 - c) *Location of incident: building, room, location in room*
 - d) *Time of incident*
 - e) *Amount of material*

2.2 Non-plumbed Devices

- A. Self-contained bottled eyewash stations may be used to supplement, but not to replace, plumbed eyewash stations as the design is not hands free nor is the flow sustainable.
 1. The reagents for this type of eyewash station shall be replaced immediately upon expiration or after use. Sealed sterile reagents must be replaced after opening.
 2. Self-contained equipment should be visually checked weekly to determine if the fluids need to be changed or supplemented and to verify that adequate fluid is available.
- B. Bottled eyewash or other personal wash units such as drench hoses are considered supplemental equipment to provide for immediate flushing. The injured individual should proceed to a plumbed eyewash.
- C. Decontamination should be done progressing downward (i.e. from head to feet). Mild soap may be used.
- D. Criteria for inspection of function and availability of non-plumbed devices:
 1. Visibility - All signs, labels or markings are legible, visible, and appropriate.
 2. Flushing fluids shall be stored in accordance with manufacturer's recommendations.
 3. Bottled Eyewash Solution Check - The solution shall be unexpired and unopened.

3 Literature and Supporting Documentation

OSHA 1910.151. Medical Services and First Aid.

Quality Incident Report (LAB-510) or electronic equivalent

Employer's First Report of Injury or Illness (WC-01)



Safety Manual

Subject: Eyewashes and Safety Showers

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Incident Report (WC-12)

Authorization for Release of Information(SORM-16)

Employee's Report of Injury (SORM-29)

Employee's Election Regarding Utilization of Sick & Annual Leave (SORM-80 – Non Commissioned)



Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Modification to Section 2 D, "The flow <u>rate of</u> through the safety showers should be tested periodically to ensure a flow of <u>approximately a minimum of 20</u> gallons per minute."
02	08/01/2019	Revision – All Sections



VENTILATION DEVICES

1 Scope

This document references instructions and policies regarding use of ventilation devices (such as chemical fume hoods and biological safety cabinets). The best way to prevent exposure to airborne substances is to prevent their escape into the laboratory working environment through the use of proper ventilation.

All ventilation controls must be properly maintained, inspected on a regular basis, and used within their design limits.

2 Practice

2.1 General Laboratory Ventilation

- A. Laboratory hoods in which chemicals are present shall be continuously ventilated under normal operating conditions.
- B. Laboratory ventilation systems shall be designed to ensure that chemical fumes, vapors, or gases originating from the laboratory shall not be recirculated.
- C. The ventilation device should be located in areas of minimum air turbulence to improve its effectiveness.
- D. Chemical fume hoods (laboratory hoods) should be used for work with hazardous chemicals, chemicals with low threshold limit values (TLV) or high vapor pressures, toxic vapors, flammable gases, noxious odors, or unknown chemicals. These should not be used for biological substances or other potentially infectious materials.
- E. Biological safety cabinets (BSCs) should be used for containment of blood and other potentially infectious materials.
- F. Generally, biological safety cabinets shall not be used in lieu of laboratory hoods, but may be used with small quantities of non-hazardous chemicals, except when approaching threshold limit values for the chemical. BSCs are not spark-proof.
- G. Canopy hoods, laminar flow cabinets, and ductless enclosures shall not be used in lieu of chemical fume hoods.
- H. There should not be any obstructions to vents as they may contribute to improper air circulation.

2.2 Chemical Fume Hoods (Laboratory Hoods)

- A. Chemical fume hoods, special purpose hoods, or other engineering controls shall be used when there is a possibility of an employee having an overexposure to air contaminants generated by a laboratory activity.
- B. Chemical fume hood face velocities shall be sufficient to contain contaminants and vapors within the hood and exhaust them outside of the building.
 - 1. Face velocities for fume hoods shall meet manufacturer specifications.
 - 2. For variable sashes, the safe operating height and/or operating area shall be determined when installed.



3. If the safe operating area is less than the maximum sash opening, then the sash location for safe operation shall be identified with a mechanical sash stop and/or a label or sign.
- C. A measuring device and alarm for hood airflow shall be permanently installed on each laboratory hood such that it provides a continuous indication to the operator that the airflow is adequate. A combination audible and visual alarm shall alert unsafe airflow as determined by the hood manufacturer's specifications.
- D. Maintenance and Performance Checks
1. Chemical fume hoods are required to be inspected, tested, and certified after installation, annually, when modified, and when the exhaust duct system connected to it has been modified. This inspection shall be to manufacturer specifications and/or established standards and shall be performed by an external vendor who is qualified to service chemical fume hoods.
 2. A label or sign containing information of the last inspection shall be affixed to each hood or maintained in a log in accordance with established standards.
 3. Deficiencies in hood performance shall result in immediate suspension of all activities inside the hood until the deficiencies are corrected.
 4. The hood shall be checked during regular safety inspection for compliance with part E – General Chemical Fume Hood Practices.
- E. General Chemical Fume Hood Practices
1. Use appropriate PPE. This should include eye protection.
 2. Hoods should not be used beyond their design limits.
 3. A chemical fume hood must not be used for perchloric acid. Perchloric acid vapors can settle on ductwork, resulting in the deposition of perchlorate crystals. Perchlorates can accumulate on surfaces and have been known to detonate on contact, causing serious injury.
 4. The hood must remain "on" at all times when chemicals are inside the hood.
 5. When the hood is not in use, maintain sash position according to manufacturer's specification.
 6. Never allow your head to enter the plane of the hood opening. For example, for vertical rising sashes, keep the sash below your face; for horizontal sliding sashes, keep the sash positioned in front of you and work around the side of the sash.
 7. Be sure that nothing blocks the airflow through the baffles or through the baffle exhaust slots.
 8. The vent ducts and fans must be kept clean and clear of obstructions.
 9. Keep all materials inside the hood at least six inches from the sash opening.
 10. An apparatus inside the hood should be kept towards the rear of the hood to prevent vapors from escaping.
 11. Large equipment (e.g., a centrifuge) should be elevated above the base of the hood interior to permit airflow.



12. Hoods should not be used as a storage area for stock and bulk chemicals.
13. Promptly report any hood that is not functioning properly to your supervisor. The sash should be closed and the hood taken out of service until repairs can be completed.

2.3 Fume Exhaust (Extraction) Arms (or snorkels)

- A. Fume exhaust connections, commonly called snorkels, elephant trunks or flex ducts, are designed to be somewhat mobile allowing the user to place it over a small area needing ventilation.
- B. For optimal efficiency, these connections must be placed within six (6) inches of an experiment, process, or equipment. These funnel-shaped exhausts aid in the removal of contaminants or irritants in the air from a point source to the outside.

2.4 Biological Safety Cabinets (BSCs)

- A. The laboratory classification for activities involving biological substances or other potentially infectious materials is Biosafety Level 2, which requires the use of the Biological Safety Cabinets (BSC) as a primary containment device to protect laboratory workers and the immediate laboratory environment from aerosols generated during sampling of blood, biological substances, or other potentially infectious materials.
- B. Biological Safety Cabinets (Class II) are similar to chemical fume hoods, except that they are equipped with HEPA (high efficiency particulate air) filters, and the cabinet is designed for different airflow patterns.
 1. The BSC (Class II Type A) can be recirculated into the laboratory environment. One of the disadvantages with this type of BSC is that the use of chemicals within the BSC needs to be very limited because some chemicals are not filtered by the HEPA filters and become mixed with the laboratory environment air or the chemical may become more concentrated within the BSC.
 2. The BSC (Class II Type B) is vented outside of the building; it allows more flexibility with regard to the use of minute quantities of chemicals.
 3. For applications involving chemicals, it is preferable to use the BSC (Class II Type B2), which does not recirculate air within the BSC and has total exhaust to the outside through a HEPA filter.
- C. Maintenance and Performance Checks
 1. BSCs are required to be certified to meet or exceed manufacturer specifications and/or established standards after installation, annually, when modified, and when the exhaust duct system connected to it has been modified. This inspection shall be performed by an external vendor, who is qualified to service biological safety cabinets.
 2. A label or sign containing information of the last inspection shall be affixed to each BSC or maintained in a log in accordance with established standards.
 3. Deficiencies in BSC performance shall result in immediate suspension of all activities inside the hood until the deficiencies are corrected.



D. General Biological Safety Cabinet Practices

1. Wear appropriate personal protective equipment.
2. Only materials and equipment needed for the immediate work should be placed in the BSC. Store extra supplies outside the BSC.
3. Do not use equipment or supplies inside the BSC that disrupt the protective BSC airflow pattern.
4. If large equipment must be placed inside the BSC, place it as far back in the BSC as practical. Do not work with open containers of infectious or hazardous materials in front of the large equipment.
5. Move arms in and out of the cabinet slowly, perpendicular to the face opening, to limit disruption of the air curtain.
6. Manipulation of materials inside the cabinet should be delayed for 1 minute after placing hands/arms inside the cabinet to allow the air to stabilize and to "air sweep" arms.
7. Do not rest arms on front grille (unless the BSC is specifically equipped with features that permit this action) because doing so allows room air to flow directly into the work area rather than being drawn through the front grille. Instead, work with both arms raised slightly.
8. Perform all operations on the work surface and at least 4 inches from the front grille.
9. Do not block the front grille.
10. Allow cabinet blowers to operate for at least 3 to 5 minutes before beginning work to allow the BSC to "purge" particulates.
11. If necessary, use plastic-backed absorbent toweling on the work surface (but not on the front grille) to aid in cleanup and spill containment.
12. Make sure that active work flows from clean to contaminated areas across the work surface. Materials and supplies should be placed in the cabinet in such a way as to limit the movement of "dirty" items over "clean" ones.
13. To minimize frequent in/out arm movement and maintain the air barrier, do not tape biohazard collection bags to the outside of the BSC; upright collection containers should not be used in the BSC and/or placed on the floor outside the BSC. (Alternatively, horizontal discard trays containing an appropriate chemical disinfectant can be used).
14. Use the aseptic techniques below to reduce splatter and aerosol generation:
 - a) *Opened bottles or tubes should be held at a slight angle.*
 - b) *Hold the lid above open sterile surfaces to minimize direct impact of downward air.*
 - c) *Open flames shall not be used because they create turbulence that disrupts the pattern of air supplied to the work surface.*
 - d) *Aspirator bottles or suction flasks should be connected to an overflow collection plastic flask containing an appropriate disinfectant and to an in-line HEPA filter and be located in the back corner of the BSC.*



- e) *If spilled liquid enters through the front or rear grilles, close the drain valves and pour decontaminating solution into the drain pans. Use the appropriate decontamination solution and contact time for the blood/OPIM handled in the BSC.*
- f) *Carefully handle the paper towels used for cleanup, as any materials present in the catch basin that are caught in the exhaust plenum may require BSC decontamination and the cabinet body being opened to remove the object.*
- g) *Immediately following the handling of blood/OPIM in the BSC, decontaminate surfaces and the BSC contents with the appropriate solution for the appropriate contact time. Do not allow any potential contamination on the interior surfaces to remain until the end of the work shift as this will reduce the efficiency of decontamination procedures.*
- h) *When work is finished, surface decontaminate all items that are to be brought out of the BSC prior to their removal.*
- i) *After removal of these items, the interior walls and the interior surface of the window shall be wiped with 10% bleach solution or other appropriate disinfectant.*

3 Literature and Supporting Documentation

Occupational Safety and Health Standards 29 CFR 1910.1450. Occupational exposure to hazardous chemicals in laboratories.

Occupational Safety and Health Standards 29 CFR 1910.1030 Bloodborne Pathogens

NFPA 45:2015 Standard on Fire Protection for Laboratories Using Chemicals.

American National Standards for Laboratory Ventilation, ANSI/AIHA Z9.5-2003



Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Minor Revision Section 2.1 C Modification to Section 2.2 B #2 "Hoods should not be used as a <u>chemical storage area for stock and bulk chemicals.</u> " Modification to Section 2.2 C " Personnel should be aware of steps to take In case of power failure or other causes of hood failure, <u>the laboratory must have a plan of resolution.</u> " Modification to Section 2.2 B #2 " <u>Certified annually by an external vendor, who checks the Annual certification to OSHA Bloodborne Pathogen Standard. Measurement of the flow rate and checking the function of the HEPA filter.</u> The HEPA filter may <u>only</u> be changed out by a professional, trained to perform this task.
02	10/09/2006	Deletion Section 2.1 A Modification to Section 2.2 A "Hoods should provide 60 to 150 linear feet per minute of air flow. Many hoods are installed to provide about 400 feet per minute. The minimum face velocity for any exhaust hood must not be less than 60 linear feet per minute with sash in the 18" open or working position. An upper limit of 150 ppm has been suggested because as the air flows into the hood, eddying around the hood worker's body tends to create a negative pressure area directly in front of the person's body. " Deletion Section 2.2 D
03	08/01/2019	Revision – Title and All Sections



FIREARM SAFETY

1 Scope

All analysts and technicians who may encounter firearms in their work duties should be aware of firearm safety.

2 Practice

2.1 General Firearm Safety

- A. All firearms shall be treated as being loaded until they are verified to be unloaded.
- B. No firearm will be pointed at any person, including oneself, with the exception of checking the bore for condition and/or obstructions by properly trained personnel.
- C. It may be necessary for a properly trained individual to ensure that a firearm is unloaded whether it was submitted in an unsealed or a sealed condition. The firearm should be tagged to indicate its unloaded condition, and will be noted in the case record that it was checked. If a firearm cannot be unloaded during submission, the container will be marked as such until such time as properly trained personnel can examine the firearm in a controlled environment.
- D. Any concerns about the safety of a firearm should be brought to the attention of a firearms examiner, other trained individual, and/or supervisor.
- E. If the firearm looks or feels like it has been modified refer to the FTM manual for further instructions.

2.2 Test Firing Safety

- A. All test firing should be conducted with an individual in close proximity in case of an accident. Proper personnel should be notified of firing prior to and upon completion of firing.
- B. All personnel in a test firing area will wear suitable eye and hearing protection. Body and face shields, or other appropriate protective measures, should be used in situations where bullet or gun fragments could be deflected towards the shooter or observers.
- C. Protective eyewear worn while shooting shall be designed and manufactured for that purpose.
- D. The bore of the firearm should be checked for obstructions prior to loading, and the firearm should be loaded only in the test firing area. Only proper ammunition shall be used in test firing.

2.3 Test-Firing Media

- A. Water tanks should be kept in a locked area.
- B. If fouling of the water is observed, maintenance will be performed to include the use of an appropriate algaecide and/or draining and refilling the water following environmental regulations.
- C. Fire extinguishers shall be readily accessible when test firing into a bullet recovery trap.



2.4 Lead Vapor and Particle Contamination

- A. For outdoor test firing, attempt to have the prevailing wind blow firearm discharge residue away from the shooter's face.
- B. For indoor test firing, ventilate the area in a manner that removes discharge residue from the shooter's face. Ventilation should be adequate to reduce exposures below the regulation maximum.
- C. If no suitable ventilation is available in inside areas, the shooter and any observer(s) will wear a nose and mouth mask approved for toxic particles. This alternative is not recommended, due to lead buildup in the shooting area and subsequent employee exposures.
- D. Cleanup of lead residue in the test firing areas may be performed when necessary. This cleanup will only be performed by properly trained professionals.
- E. Lead capturing floor mats shall be in place at the exit of the firing range.



Safety Manual

DRN: SAF-01-06

Subject: Firearm Safety

Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/09/2006	Deletion previous Section 2.1 A-B Addition Section 2.1 A-D regarding loaded/unloaded condition of firearms and special handling.
02	08/01/2019	Revision – All Sections



COMPRESSED AND LIQUEFIED GAS SAFETY

1 Scope

To provide guidance for safety with compressed and liquefied gases.

2 Potential Health Hazards

- A. Cylinders of compressed gases should be treated as high-energy sources and, therefore, as potential explosives. All gas cylinders shall be protected against undue absorption of heat from sunlight or other heat sources.
- B. Cryogenic liquids are extremely cold. Prolonged exposure of the skin or contact with cold surfaces can cause frostbite, which may cause the skin to appear waxy and yellow. Eyes can be damaged by short exposures that may not damage surrounding skin.
- C. Prolonged breathing of extremely cold and heavy gases may damage the lungs and can cause asphyxiation. Cold, heavy gas does not disperse readily and can accumulate near the floor, displacing air, especially in relatively small spaces. For example: liquid nitrogen has a liquid to gas expansion ratio of 710 times.
- D. All personnel who could be exposed to a gas discharge or who may be in proximity to a cylinder during the course of their work duties must be trained to be aware of the potential hazards, know and practice appropriate protective measures, and know how to respond in an emergency involving compressed, liquefied, and cryogenic gas.

3 Practice

- A. Follow individual chemical's SDS recommendations for the appropriate PPE. **Avoid contact with body parts.** Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.
- B. Prevent skin/eye contact through the use of impervious gloves, clothing, boots, apron, and eye goggles or full face shield.
- C. A self-contained breathing apparatus may be used if a possible asphyxiation hazard exists.
- D. All compressed-gas cylinders and liquefied gas containers should be treated as if they are full.
- E. All gas cylinders in service or storage, empty or full, shall be firmly secured to fixed, rigid structures so they cannot fall or be knocked over. Distance between a cylinder and the instrument it is supplying should be minimized. Acetylene cylinders should always be stored upright.
- F. Cylinder caps shall be in place during the movement or storage of cylinders when practical.
- G. If gases are stored in confined spaces, a functional O₂ sensor should be in place.
- H. Liquefied gas containers, including dewars, shall not be transported in an elevator or stairwell along with any personnel. The containers are to be loaded onto the elevator and sent to the appropriate floor. Laboratory and delivery personnel are to meet the elevator at the appropriate floor to unload the containers and properly store them. Any containers being returned shall be handled with the same procedure.



Safety Manual

DRN: SAF-01-07

Version: 02a

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Subject: Compressed and Liquefied Gas Safety

- I. The proper regulator for the particular gas shall be used.
- J. Connecting lines and fittings shall be of sound construction with adequate strength for the pressures used and compatible for the gases used.
- K. Connection fittings should be checked for leaks when a cylinder is replaced.
- L. A cylinder cart with safety chain or other safety device shall be used when transporting cylinders.



Safety Manual

DRN: SAF-01-07

Subject: Compressed and Liquefied Gas Safety

Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Modification to Section 2 #8 " Use of A cylinder cart with safety chain or other safety device is strongly recommended shall be used when moving <u>transporting</u> cylinders.
02	05/01/2017	Addition of Liquefied gases Major Revision
02a	08/01/2019	Administrative Revision – Changed issuing authority to System Quality Manager



FIRE SAFETY

1 Scope

General practices and requirements for fire safety are provided. Based on the amount of flammable and combustible liquids on hand in a Department laboratory, the laboratory unit fire hazard classification may range from C (Low) to D (Minimal) and Life Safety classification as industrial occupancy. These classifications require that the laboratory have an emergency response plan.

2 Practice

2.1 Emergency Action Plan

A. Policy

1. Each laboratory must have a fire emergency response plan.
2. All employees must be informed about the proper use of safety devices, and the expected site-specific emergency responses and evacuation procedures.
3. If the fire is small, a fire extinguisher may be used. If the fire is contained in a small vessel, suffocate the fire by covering the vessel. Do not pick up the vessel. Do not cover with dry towels or cloths. Remove nearby flammable materials to avoid spread of the fire.
4. An employee may attempt to extinguish small fires from a position from which they can escape provided they have been trained in the proper use of fire extinguishers and are confident that they will be successful. Do not risk your life to fight a fire!
5. Do not use the fire extinguisher if the fire has spread past the point of origin.
6. Confine the fire if possible to do so without endangering yourself or other personnel:
 - a) *Shut down equipment in the immediate area, if possible.*
 - b) *Always maintain a clear escape path for yourself.*
 - c) *Close doors, if possible, to prevent spread of smoke or vapors into adjoining rooms and corridors.*
 - d) *Never enter a smoke-filled room.*
 - e) *Never enter a room containing a fire without a backup person being present.*
 - f) *Feel all doors for heat before opening. Do not open a door that is warm to the touch. If the door is cool, kneel as low to the floor as possible before entering the room.*
7. Report the emergency condition to your supervisor and follow his/her instructions.
8. If you are unable to extinguish the fire or if smoke builds up quickly, evacuate the building using the building's evacuation plan.



B. Detection and Alarm System

1. The laboratory shall have a smoke and/or fire detection system. Detection systems should be inspected per manufacturer guidelines. Testing of the detection system does not necessarily need to be done in conjunction with a fire drill.
2. Methods of alerting all personnel should include alarm activation. A verbal alarm system may be used describing the fire location. Evacuate the building using the building's evacuation plan.
3. If a fire alarm system exists but is inoperable, it must be clearly identified as nonfunctional. It is illegal to have an alarm system which appears to be functioning but does not work.
4. Fire drills shall be conducted annually. The documentation is archived annually with the final biannual safety inspection documentation.

C. Evacuation Plan

1. The following will be posted in prominent locations throughout the building:
 - a) *Evacuation plan*
 - b) *Building re-entry procedure*
 - c) *Building floor plans showing evacuation routes*
 - d) *Building contacts (use LAB-SAF-03, Building Emergency Information)*
 - e) *A list of evacuation coordinators (use LAB-SAF-03, Building Emergency Information)*
 - f) *Any necessary equipment or services shut down procedures*
2. After evacuation has been completed, Laboratory Managers and section supervisors (or their designees) will account for each of their employees with use of the Building Evacuation Log (LAB-SAF-08) and report to the appropriate evacuation coordinator.
3. The Building Evacuation Coordinator will write a short description of the event, any actions taken, review with the Laboratory Manager, and send to the Health and Safety Manager within 24 hours of the event. This does not apply to routine fire drills.

D. Awareness for Emergency Personnel

1. Key box with master key(s) should be located at an accessible location.
2. The Workplace Chemical List (LAB-SAF-10) will be made available to emergency personnel.

2.2 Fire Fighting Equipment

The laboratory should be equipped with the following:

A. Sprinklers



B. Extinguishers

1. The laboratory will have access to one or more fire extinguishers of the appropriate type.
 - a) *Ordinary Combustible Fires (Type A)*
 - b) *Liquid Combustible Fires (Type B)*
 - c) *Electrical Fires (Type C)*
 - d) *Combustible Metals (such as magnesium, titanium, potassium and sodium) (Type D)*
2. The employee travel distance to the appropriate extinguisher should be as follows:
 - a) *Within seventy-five feet for type **A** extinguishers*
 - b) *Fifty feet for type **B** or **C** extinguishers (this distance may vary based on the rating of the fire extinguisher/capacity for suppressant materials)*
 - c) *Within seventy-five feet for type **D** extinguishers*
3. All extinguishers must be inspected annually by a certified fire extinguisher technician.

- C. Non-asbestos fire blanket(s) may be available for use.

2.3 Engineering Practices

- A. The locations of safety devices, exits, and flammable reagents/chemicals should be clearly marked.
- B. Exits should be kept clear of obstructions.
- C. Eliminate clutter which might hinder visibility or access to fire safety devices.
- D. Flammable solvents shall be stored in sealed containers away from electrical devices, heat sources, and open flame.
- E. Safe chemical storage practices should be followed.
- F. Electrical equipment should be routinely examined for worn or frayed electrical cords or overheating.

3 Literature and Supporting Documentation

NFPA 45, Standard on Fire Protection for Laboratories Using Chemicals, 2015 edition.

NFPA 101, Life Safety Code, 2015 edition.



Safety Manual

DRN: SAF-01-08

Subject: Fire Safety

Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Modification to Section 2.2 #1, "The laboratory should <u>shall</u> have a <u>functioning smoke and/or</u> fire detection system."
02	08/01/2019	Revision – All Sections



EQUIPMENT AND ELECTRICAL HAZARDS

1 Scope

Instruments and other laboratory equipment can be a source of electrical hazards. It is important for analysts to understand the risks and hazards associated with various equipment in their laboratory.

2 Electrical Hazards

- A. No alteration of the manufacturer's safety features will be allowed.
- B. Where shock hazards exist, rubber floor mats should be used.
- C. Any electrical failure or evidence of undue heating of equipment should be reported immediately to a supervisor. All maintenance will be performed by qualified personnel.
- D. Laboratory personnel should routinely inspect electrical equipment to identify potential hazards such as frayed, worn, or cracked cords, damage to plugs, and poor fit to outlet. Extension cords should not be in permanent use.
- E. Laboratory personnel should be aware of the location of laboratory circuit breakers in their respective work areas.
- F. Electrical cables should be protected from flooding and mechanical damage to guard against shock hazards.
- G. The location of power supplies and water baths should minimize the possibility of electrical contact with liquids.

3 Miscellaneous Equipment Hazards

- A. Vacuum systems that are not implosion-protected should have shielding to guard against implosion.
- B. Condensation from a cooling apparatus should be monitored and not allowed to accumulate on instruments. Drain reservoirs should be inspected and emptied regularly.
- C. Ovens with arcing motors, which could ignite vapors, should not be used to heat containers of flammable fluids. Hot water, steam baths, and heating mantles eliminate spark sources and are recommended alternatives.
- D. Centrifuges shall be operated with the lid closed when in use. All tubes should be inspected before loading into the centrifuge. In the event of a spill in the centrifuge, it must be cleaned and disinfected immediately adhering to chemical hazard or biohazard precaution protocols.
- E. Burners, induction heaters, ovens, furnaces, and other heat producing equipment shall be located a safe distance away from areas where flammable and temperature sensitive materials and compressed gases are handled/stored.
- F. When working with alternate light sources, proper eye protection shall be worn. Warning signs must be posted to advise personnel of the eye hazards present.
- G. Prior to use, personnel should receive proper training for shop tools. Proper PPE will be worn, as appropriate, to work safely.



Safety Manual

DRN: SAF-01-09

Subject: Equipment and Electrical Hazards

Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Modification to Section 2 E " <u>Laboratory personnel</u> Lab supervisors should be aware of the location of laboratory circuit breakers <u>in their respective work areas</u> .
02	05/01/2017	Major Revision All Sections
02a	08/01/2019	Administrative Revision – Changed issuing authority to System Quality Manager



RADIATION SAFETY

1 Scope

Laboratories containing radiation sources as defined by the Texas Department of State Health Services (TDSH) are required to meet additional requirements specific to radiation safety. This document references the requirements and responsibilities that must be followed to ensure that any radiation exposure risk to employees, visitors, and the public is kept as low as reasonably possible. Currently, only the Austin lab contains instruments meeting the definitions from TDSH.

2 Responsibility

- A. Laboratory employees are responsible for:
 - 1. Conducting work in such a manner so as to ensure not only their own safety, but also the safety of others.
 - 2. Identifying and recognizing work safety hazards, notifying the radiation safety advisor, supervisor or quality manager, and making recommendations to the laboratory system pertaining to these hazards.
- B. The Radiation Safety Advisor(s) is responsible for:
 - 1. Conducting inspections of the laboratory and ensuring compliance with all regulations.
 - 2. Make recommendations to laboratory management and the Health and Safety Manager for any improvements in radiation safety.
- C. The Quality Manager is responsible for:
 - 1. Appointing the Radiation Safety Advisor(s)
 - 2. Ensuring that the operations of their sections are conducted in a safe manner and shall give safety a top priority
 - 3. Enforcing appropriate disciplinary action if employees do not follow appropriate safety rules.

3 Practice

3.1 General Requirements

Users will follow the radiation safety requirements listed below:

- A. All workers must be informed of the presence of all radiation sources, the nature of the materials and potential radiation exposures.
- B. All radiation areas must be properly posted and labeled.
- C. Records of users and use must be maintained.
- D. Minimize exposures to external radiation by limiting exposure times, by maintaining adequate distances from sources during use, and by using shielding where appropriate.
- E. Ensure the safety of all individuals and compliance with all pertinent regulations, policies, and procedures.

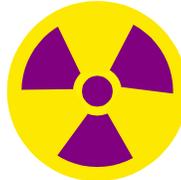


3.2 Signage

The Radiation Safety Advisor will post all signs required by law to mark radiation producing machines. The symbol prescribed for signs warning of radiation producing machines is the conventional three blade design with magenta or purple blades and hub on a yellow background.

Radiation areas shall have conspicuously posted signs bearing the radiation caution symbol and the words:

CAUTION (or DANGER)



RADIATION AREA

3.3 Inspections

- A. The Radiation Safety Advisor will perform inspections or have them performed by a qualified person. The frequency of these inspections may be from monthly to annually, depending on the Radiation Safety Advisor's assessment.
- B. The inspections will include site surveys, survey-meter operation, sign posting and record keeping. The original copy of the laboratory inspection results will be saved.
- C. After inspections, the Radiation Safety Advisor must assure follow-up for compliance with radiation safety regulations. Unsafe operations and non-compliance shall be corrected by the Radiation Safety Advisor or designated representatives.

4 Records

In order to ensure compliance with all regulations, several types of records are required. The records will be maintained by the Radiation Safety Advisor.

- Registrations of instruments
- Licenses for use of radioactive materials
- Responses to agency queries
- Radiation user records
- Radiation Control Advisor applications and authorizations
- Individual training records
- Instrument calibrations



Safety Manual

DRN: SAF-02-01

Subject: Radiation Safety

Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	08/01/2019	Revision – All Sections



CHEMICAL HYGIENE PLAN

1 Scope

The Chemical Hygiene Plan is designed as a tool to coordinate chemical safety procedures involving use, storage and disposal of hazardous chemicals. This policy applies to all laboratory employees involved in the use of hazardous chemicals.

2 Practices

2.1 Chemical Hygiene Awareness

- A. Chemicals and reagents shall be labeled in accordance with the Laboratory Equipment chapter in the Crime Laboratory Service Manual.
- B. If working with chemicals, employees should not work alone. At a minimum another employee shall be notified as to the anticipated duration the employee will be working alone.
- C. Employees shall be familiar with:
 - 1. Location and proper use of emergency equipment.
 - 2. Proper personal hygiene and conscientious laboratory housekeeping practices.
 - 3. The proper methods of transporting and storing chemicals within the facility.
 - 4. Appropriate procedures for emergencies, including evacuation routes, spill cleanup procedures and proper waste disposal.

2.2 Handling

- A. When working with chemicals, hands should be kept clean and away from the face. Proper PPE should be used and it should be stored in a manner and location to prevent contamination. Direct contact or inhalation of any chemical should be avoided.
- B. Chemicals that are acute respiratory hazards should not be used in a confined area.
- C. Chemicals shall be dispensed and handled only where there is adequate ventilation, preferably in a chemical fume hood. Consideration should be given to the SDS and acceptable levels of protection.
- D. Do not use any substance in an improperly labeled container. Unlabeled chemicals should be marked "Unknown" and notify the supervisor and Laboratory Manager.
- E. Do not take more of a chemical than necessary or return excess back to the original container.
- F. Chemical work areas should be cleaned after use.

2.3 Storage Precautions

- A. General Considerations
 - 1. Chemicals shall be stored according to the chemical properties. For reactive chemicals, all proper safety precautions will be used including extra segregation in storage.



2. Consideration shall be given to the quantities of chemicals that can be safely stored.
3. Chemical storage areas shall be planned with personnel safety in mind (e.g., whether personnel would be able to get out of the laboratory in the event of an accident in the storage area).
4. Chemicals on shelves shall be within reasonable reach.
5. Untreated metal shelf brackets shall not be used where corrosives and oxidizing reagents are stored.
6. Review storage compatibilities before storing chemicals.
 - a) **Reactives shall be segregated from Ignitables**
 - b) **Acids shall be segregated from Caustics**
 - c) **Corrosives shall be segregated from Flammables**
 - d) **Oxidizers shall be segregated from EVERYTHING**
 - e) **Many Corrosives are "Water Reactive"**
 - f) **Most Organic Reactives shall be segregated from Inorganic Reactives (metals)**

B. Flammables

1. Limits of Flammable and Combustible Liquids

Laboratory Unit Fire Hazard Classification	Excluding Quantities in Storage Cabinets		Including Quantities in Storage Cabinets	
	Maximum Quantity Flammable and combustible liquids per 100 ft ² (L)	Maximum Quantity Flammable and combustible liquids per Laboratory Unit (L)	Maximum Quantity Flammable and combustible liquids per 100 ft ² (L)	Maximum Quantity Flammable and combustible liquids per Laboratory Unit (L)
C (Low)*	15	757	30	1515
D (Minimal)*	4	284	7.5	570

*Reduce quantities by 25 percent for laboratory units located on the 4th-6th floors.

Excerpt from NFPA (National Fire Protection Association) – Standard on Fire Protection for Laboratories Using Chemicals

2. Bulk flammable solvents shall be kept in an approved flammable storage cabinet or solvent storage room. No container of flammable solvents larger than five gallons shall be stored in the laboratory.
 - a) *Store only compatible materials inside the cabinet.*
 - b) *Do not store paper or cardboard inside cabinets with the chemicals.*
 - c) *Do not overload the cabinet.*
3. Flammable liquids should be kept in cans specifically designed for them. Containers of liquid in excess of four (4) liters with flash points below 100°F shall be stored in safety cans.
 - a) *A flame arrestor screen shall be kept in place at all times and replaced if punctured or damaged.*
 - b) *Chemicals in a safety can shall be stored in storage areas and not in laboratory work areas or hallways.*



c) *All flammables shall be protected against sources of ignition.*

4. Explosion proof refrigerators are recommended for storing extremely flammable liquids.

C. Acids and Bases

1. Acids and Bases should never be stored together
2. Store large bottles of acids or bases on low shelves.
3. Segregate strong acids from strong bases, active metals (e.g. sodium, potassium, and magnesium) and from chemicals that would generate toxic gases upon contact, such as cyanide and sulfide salts. Acids should be segregated from alcohol, water, aldehydes, halogenated/nitrated or unsaturated hydrocarbons, reactive organic compounds/solvents, and oxidizers.
4. Segregate strong bases from strong acids, active metals (e.g. sodium, potassium, and magnesium) and from chemicals that would generate toxic gases. Caustics should be segregated from alcohol, water, aldehydes, halogenated/nitrated or unsaturated hydrocarbons, and reactive organic compounds/solvents.

D. Oxidizers

1. Store in a cool, dry place.
2. Segregate from flammable and combustible materials, and reducing agents such as zinc, alkaline metals, and formic acid.

E. Water-Reactive Chemicals

1. Store in a cool, dry place.
2. Keep away from water.

F. Pyrophoric Chemicals

1. Pyrophoric chemicals can ignite spontaneously upon contact with air.
2. Store in a cool, dry place.

G. Light-Sensitive Chemicals

Store in amber bottles or in a manner that avoids exposure to light in a cool, dry place.

H. Toxic Chemicals

Store according to the hazardous nature of the chemical and take proper precautionary measures to avoid exposure.

I. Peroxide-Forming Chemicals

1. Store in airtight containers in a cool, dark, dry place
2. Glass containers of any size should be avoided.
3. No attempt should be made to open containers of uncertain age or condition, or with caps or stoppers tightly stuck (since peroxides have been known to form in the cap threads).



2.4 Chemical Waste

1. All waste shall be stored in containers.
2. Containers shall be in good condition and compatible with the waste they contain.
3. Containers shall be kept closed at all times except when adding or removing waste.
4. Containers should be segregated appropriately during storage.

The containers shall have labels indicating their contents, relative amount of chemicals in the mixture, and conform to the applicable hazard categories of the constituent chemicals in the mixture (e.g. organic wastes).
5. When handling chemical waste, gloves, mask, eyewear, and lab coat shall be worn.
6. Chemical waste material shall be disposed of in accordance with department policy (Destruction of Evidence chapter in the Crime Laboratory Service Manual).

3 Literature and Supporting Documents

OSHA 29 CFR1910.1450 – Occupational Exposure to Hazardous Chemicals in the Laboratory

OSHA 29 CFR1910.1200 – Hazard Communication

NFPA 400, Hazardous Materials Code, 2013 edition.

NFPA 30, Flammable and Combustible Liquids Code, 2015 edition.

NFPA 45, Standard on Fire Protection for Laboratories Using Chemicals, 2015 edition.



Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	<p>Modification to Section 3.3 #1 “As new <u>When purchased</u> chemicals are received, the containers must be initialed and dated.”</p> <p>Addition Section 3.3 #2 <u>“When chemicals are initially opened, the containers must be initialed and dated.</u></p> <p>Deletion Section 3.4 B #1 (b), pertaining to storage of similar vapor density chemicals.</p> <p>Modification to Section 3.4 B #2 “...Liquid quantities <u>Containers of liquid</u> in excess of four (4) liters with flash points below 100°F shall be stored in safety cans.”</p>
02	10/09/2006	<p>Deletion Section 2</p> <p>Modification to Section 2.3 #1 <u>“Purchased chemicals must be marked with the date of receipt or the date initially opened. When purchased chemicals are received, the containers must be initialed and dated.”</u></p> <p>Modification to Section 2.3 #2 “When chemicals are initially opened, The containers <u>Chemicals that may become unstable or explosive must be initialed and dated when first opened.”</u></p> <p>Modification to 2.4 B #3 <u>“Explosion proof refrigerators are recommended for storing extremely flammable liquids. If a refrigerator/freezer is used for storing extremely flammable liquids, it must be explosion proof.”</u></p>
03	08/01/2019	Revision – All Sections



HAZARD COMMUNICATION

1 Scope

The Texas Health and Safety Code Chapter 502 Hazard Communication Act requires all public employers in Texas to provide their employees with information regarding hazardous chemicals to which they may be exposed in the workplace.

For the purpose of employee right-to-know, these guidelines convey requirements for communication of workplace chemical lists, safety data sheets/SDS, and container labels.

These guidelines do not apply to: hazardous or radioactive waste that is subject to regulation by another agency; food, drugs, cosmetics or alcoholic beverages; consumer products or hazardous substances used in the workplace in the same manner as normal consumer use unless their use results in a duration and frequency of exposure that is greater than exposures experienced by a consumer.

2 Practice

2.1 Notice to Employees Right-to-Know

- A. A current version of the workplace notice (TAC Title 25 Part 1 §295.12) shall be clearly posted at all locations in the workplace where notices are normally posted.
- B. The addition of new chemicals alone does not necessarily require additional training.

2.2 Workplace Chemical List (LAB-SAF-10)

- A. A current laboratory workplace chemical list must be reviewed, updated as necessary, and archived by December 31st of each year. Each workplace chemical list shall be dated and signed by the person responsible for compiling the information. The workplace chemical list must include the identity of the chemical as found on the SDS and the work area where it is intended to be used.
- B. The workplace chemical list must be readily available to employees and their representatives. The employee shall be made aware of the current workplace chemical list for their respective work area(s).
- C. The workplace chemical list also serves as an important resource for emergency response personnel (planning or actual responses).

2.3 Safety Data Sheets

- A. Safety Data Sheets (SDS) have replaced Material Safety Data Sheets (MSDS). The SDS shall replace the MSDS on file. Training on both the old MSDSs and the new SDSs should continue throughout the transition period until the old MSDSs have been replaced.
- B. The laboratory must ensure that a current SDS is available and accessible for review by employees for every chemical used or stored at that location.
- C. A current and appropriate SDS for each chemical stored will be maintained, which contains the most recent significant hazard information for the chemical as determined by the chemical's manufacturer. If the chemical was last received prior to the original effective date of the Hazard Communication Act, January 1, 1986, an SDS is not required.



- D. Incoming SDS will be reviewed by the Laboratory Manager or designee for new and significant health/safety information and any new information will be communicated to the affected employees.
- E. A chemical manufacturer or distributor should provide appropriate safety data sheets to employers who acquire chemicals in this state with each initial shipment and with the first shipment after an SDS is updated. If the SDS did not accompany the chemical when received, then it can be obtained from an appropriate source (e.g. chemical manufacturer, distributor, or electronic database). The SDS does not have to be manufacturer specific if it is identical to the manufacturer specific chemical identity and formulation of the chemical.
- F. The laboratory shall not permit the use of any chemical for which a current SDS is not readily available.

2.4 Labeling of Chemical Containers

- A. All containers of chemicals used or stored by the laboratory will be appropriately labeled.
- B. Purchased Chemicals
 - 1. Prior to use, ensure that the container has been properly labeled.
 - 2. Primary (manufacturer's) containers of chemicals must be labeled with at least the identity appearing on the SDS, the appropriate hazard warnings, and the manufacturer's name and address.
 - 3. Purchased chemicals must be marked with the date of receipt or initially opened.
 - 4. Chemicals that have an expiration date or are known to become unstable or explosive must be initialed and dated when first opened.
 - 5. If an unlabeled or mislabeled chemical is received from a supplier, do not use the chemical and contact the supplier to have the chemical replaced.
 - 6. Existing labels on containers of chemicals must not be removed or defaced. If a label on a container of a chemical is illegible, it must be replaced immediately unless the container is empty.
 - 7. Containers of chemicals which were received prior to the original effective date of the Hazard Communication Act, January 1, 1986, and which do not meet the label requirements must be re-labeled in accordance with the current labeling requirements.
 - 8. Secondary containers of chemicals must be labeled, at a minimum, with its identity as it appears on the SDS and the lot number of its primary container as appropriate. Additional information found in the SDS (such as hazard warning) may also be included on the secondary container's label. When a portion of the chemical is transferred for immediate use by that employee, it is not required to be labeled.
- C. Laboratory Prepared Reagents
 - 1. Prepared reagents must follow labeling requirements for reagents as outlined in the Laboratory Equipment chapter in the Crime Laboratory Service Manual.



It may also include additional information found on the SDS sheet of the most hazardous chemical in the reagent.

2. Analytical samples and evidentiary containers are exempt from these labeling requirements, but still must follow labeling requirements in the Destruction of Evidence chapter in the Crime Laboratory Service Manual.

3 Records

Workplace Chemical List (LAB-SAF-10)

Current SDS

4 Literature and Supporting Documentation

Texas DPS General Manual, 08.03.00 Hazard Communication (HAZCOM) Program.

DPS Approved Retention Schedule (current)

Health and Safety Code, Section 502 Hazard Communication Act

Texas Administrative Code. Title 25, Part 1, Chapter 295 Subchapter A, Hazard Communication. §295.12 Employee Notice; Rights of Employees

OSHA 29CFR1910.1200 – Hazard Communication



Safety Manual

DRN: SAF-03-02

Subject: Hazard Communication Program

Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	08/01/2019	Revision – Title and All Sections



BIOLOGICAL PATHOGEN EXPOSURE CONTROL PLAN

1 Scope

An employee may be occupationally exposed to blood or other potentially infectious materials by one or more of the following routes: skin, eye, mucous membrane, or parenteral exposure.

This plan is in accordance with Bloodborne Pathogens Standard as specified in Texas Health and Safety Code, §81.304. Supervisors should review the plan for requirements as applicable to their section's potential for exposure.

2 Practices

2.1 Universal Precautions

Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials. The underlying rationale for use of universal precaution is that all items with biological substances are considered to be potentially infectious for HIV or other bloodborne pathogens. See General Lab Safety (SAF-01-01)

2.2 Handling Biological Evidence

- A. All evidence potentially containing biological substances (e.g. sexual assault evidence, clothing, cigarette butts, or bedding) shall be treated with universal precautions.
- B. Use extreme care when handling hypodermic syringes or other sharp objects. If submitted with a cap and recapping is necessary, use a mechanical device or the one-handed technique.
 1. Place the cap on a flat surface like the table or counter with something firm to "push" the needle cap against.
 2. Holding the syringe with the needle attached in one hand, slip the needle into the cap without using the other hand.
 3. Push the capped needle against a firm object to "seat" the cap onto the needle firmly using only one hand.
- C. Repackage syringes in syringe transport tubes. Blood or other potentially infectious materials shall be placed in a closeable, leak-proof container. If the primary container is contaminated, it shall be placed inside a secondary leak-proof container.
- D. Specimens containing or potentially containing biological substances needing centrifugation must be placed into a centrifuge carriage with a sealed lid, capped centrifuge tubes, or centrifuged in a hood.

2.3 Engineering and Work Practice Controls

- A. Liquid biological samples shall be opened in a biological safety cabinet (SAF-01-05).
- B. All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize spillage and release of aerosols that may contain these substances. This may include opening containers of liquid blood by covering the cap or lid with a lab wipe or paper towel to contain any spilled material.
- C. Before leaving the lab work area, all protective clothing and PPE should be removed.



- D. Employees shall wash the exposed area with soap and water as soon as possible after removal of gloves or other personal protective equipment and after any skin contact with blood or other potentially infectious materials.
- E. If soap and water are not a feasible means of washing the hands or other parts of the body, either antiseptic hand cleaner and clean cloth/paper towels, or antiseptic towelettes will suffice temporarily.

2.4 Personal Protective Equipment

- A. Laboratory personnel shall use appropriate personal protective equipment such as: gloves, gowns, aprons, lab coats, head and foot coverings, face shields or masks, and eye protection when handling and processing biological evidence (SAF-01-02).
- B. Cleaning, laundering, repair, replacement, or disposal of personal protective equipment will be provided. Laundry that is contaminated with blood or other potentially infectious materials shall be treated as if it were contaminated, handled as little as possible, and laundered as soon as practical.

2.5 Housekeeping (Cleaning and Disinfection)

- A. All workbench areas and implements used where biological evidence is handled should be routinely cleaned and sanitized with appropriate disinfectant.
- B. Equipment which may become contaminated shall be checked routinely and decontaminated as necessary.
- C. All containers intended for reuse which have a potential for becoming contaminated shall be inspected, cleaned and disinfected on a regular basis.
- D. Containers shall be cleaned and disinfected immediately or as soon as possible upon visible contamination.
- E. Reusable devices, such as tissue grinders, pipettes, etc., should be disinfected or autoclaved prior to being cleaned.
- F. Laboratory floors should be disinfected as needed.
- G. Soiled or protective clothing should be cleaned or disposed of properly and soiled items discarded or bagged for laundering.
- H. Work surfaces shall be decontaminated with an appropriate disinfectant after use.
- I. A common disinfectant is 10% bleach solution.

NOTE: Fresh solution of 10% bleach made up weekly is also considered appropriate for disinfection of environmental surfaces and for decontamination of sites following initial cleanup (i.e., wiping up) of spills of blood or other potentially infectious materials. Solutions of bleach should not be stored in glass containers, but in material such as the plastic in which the bleach was packaged.

- J. Biological spill (SAF-05-03) must be promptly cleaned with an appropriate disinfectant. Personnel performing cleanup must wear appropriate personal protective equipment.
- K. Broken glassware which may be contaminated shall not be picked up directly. It shall be cleaned up using mechanical means such as a brush and dust pan, tongs, or forceps.



2.6 Infectious Waste Disposal

All laboratory specimens and disposables should be discarded in a safe manner.

- A. All biohazard containers must be properly labeled with a biohazard symbol or be red in color.
- B. Pasteur pipettes and other sharp items should be placed in puncture-resistant containers.
- C. Sharps containers shall be replaced routinely and not allowed to overfill.
- D. All biohazardous waste shall be placed in a closeable container or bag that is properly labeled and sealed to prevent leakage during handling, storage, and transporting.
- E. Biohazardous laboratory trash, such as pipette tips, test tubes, paper, disposable gloves, disposable gowns, and other items, should be disinfected or autoclaved before disposal in “regular” trash.
- F. Disposal of all blood or other potentially infectious materials or waste, including sharps shall be by an approved method in accordance with all local, state, and federal regulations (see SAF-04-02).

2.7 Communication of Hazards

- A. Biohazard Warning Symbols
 1. A biohazard warning symbol shall be posted in the designated work area where biological substances or other potentially infectious materials are processed.
 2. A biohazard symbol shall be affixed to containers used to store or transport biological substances, other potentially infectious materials, or waste including: containers used to transport samples, refrigerators, freezers, and hoods.



3. Red bags or red containers may be substituted for biohazard symbols.
4. It is permissible for individual containers not to be labeled with a biohazard symbol if they are placed in a larger container that is either labeled with a biohazard symbol or is red.
5. A container that is used to ship biological substances or other potentially infectious materials must be labeled with “Biological Substances Category B” and a UN3373 symbol. This symbol on the shipping container can be used in lieu of a biohazard symbol on the outside, but the inside container must be labeled with a biohazard symbol.





6. Biological substances, other potentially infectious materials, or waste may be stored in a properly packaged and labeled shipping container.
7. Shipping of materials containing biological substances or other potentially infectious materials shall follow guidelines from the relevant carrier.
8. Orange stickers bearing the following information, "Treated Medical Waste in accordance with 25 TAC Chapter 1" may be placed on the container of biological substances, other potentially infectious materials, or waste following steam disinfection.

B. Training

1. The employee will be provided initial training concerning exposure to biological or other potentially infectious materials.
2. Each employee with potential occupational exposure must complete supplemental exposure control training annually.

C. Hepatitis B Vaccination

1. Hepatitis B vaccination shall be offered to all employees with occupational exposure. This vaccination and the required bloodborne pathogens training must be offered within 10 days of initial assignment to a job with occupational exposure.
2. Employees who decline the Hepatitis B vaccine must sign a Hepatitis B Vaccination Declination form (LAB-SAF-02).
3. Employees who initially decline the vaccine but who later elect to receive it may have the vaccine provided at no cost to them.

3 Records

Hepatitis B Vaccination Declination form (LAB-SAF-02)

Hepatitis B Vaccination records

Safety Training Records

4 Literature and Supporting Documentation

Health and Safety Code, Subchapter H. Bloodborne Pathogen Exposure Control Plan 81.301-306.

Occupational Safety and Health Administration (OSHA) 29 CFR §1910.1030



Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Deletion Section 3.2 #8 Modification to Section 3.3 #1 "Liquid <u>biological</u> samples shall be opened in a hood." Minor Revision; clarification of section 3.4 #1 and 3.5 A #9
02	10/09/2006	Major revision regarding Hepatitis B vaccination in Sections 2, 3.6 C, and 4
03	08/01/2019	Revision – All Sections



TREATMENT AND DISPOSAL OF BIOLOGICAL WASTE

1 Scope

This policy addresses the proper treatment and disposal of biological waste and sharps. Per Title 30 Texas Administrative Code (TAC) [§326.3\(23\)](#) medical waste is defined as treated and untreated special waste from health care-related facilities. Since a crime laboratory does not constitute a health care-related facility there are no notification requirements that the laboratory needs to provide to the Texas Commission on Environmental Quality (TCEQ) for the on-site treatment of waste generated at DPS labs.

2 Practice

2.1 Universal Precautions

Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials (OPIM). Universal precautions include assuming that all evidence potentially containing biological substances is infectious.

2.2 Biological Waste Treatment

- A. Biological waste is any biological substance or waste contaminated with any blood or OPIM. Biological waste may either be treated on-site or by an approved biological waste vendor.
- B. On-Site Treatment and Disposal
 1. A log of biological waste treatment shall be maintained that contains at least the following information:
 - a) *Name (printed) and initials of the person(s) performing treatment*
 - b) *Date(s) of treatment*
 - c) *Weight of waste treated*
 2. Waste treated on site shall be treated via steam pressure in an autoclave.
 3. Persons using or working in the vicinity of an autoclave should be trained on the operation of the autoclave and use heat-resistant gloves. The autoclave must be operated according to the manufacturer's instructions.
 4. Waste shall be packaged and loaded into the chamber in accordance with the manufacturer's capacity limits in order to allow proper steam penetration.
 - a) *The temperature in the chamber of the autoclave must reach at least 121 degrees Celsius and there must be at least 15 pounds per square inch gauge pressure for at least 30 minutes*
 - b) *Along with the gauge on the autoclave, autoclave temperature indication tape may also be used to provide a reasonable estimate of the temperature attained*
 5. Treated waste may be disposed of in a permitted landfill (with normal trash) once all biological/medical waste labels are covered with an orange sticker identifying the waste as treated medical waste.



C. Autoclave Maintenance

1. The autoclave chamber should be drained and cleaned according to the manufacturer's specifications
2. If more than 50 pounds (but less than 100 pounds) of waste is treated per month, performance testing must be performed using appropriate biological indicators as defined in 25 TAC §1.132.

2.3 Sharps Treatment and Disposal

- A. Sharps include syringes, glass pipettes, specimen tubes, blood culture bottles, microscope slides, broken glass, and any other sharp object.
- B. All sharps shall be placed in puncture-resistant containers.
- C. Sharps contaminated with blood or OPIM shall be treated and disposed of in the same manner as biological waste.
- D. Unused sharps shall be disposed of as treated sharps.

3 Literature and/or Supporting Documentation

Health and Safety Code, Subchapter H. Bloodborne Pathogen Exposure Control Plan 81.301-306.

25 TAC §1.132 (relating to Definitions) from the sources specified in 25 TAC §1.134 (relating to Application) and §1.133 through §1.136 (relating to Approved Methods of Treatment and Disposition)

30 TAC §326.39 through §326.41 (on-site treatment)

Occupational Safety and Health Administration (OSHA) 29 CFR §1910.1030



Revision History

Version #	Effective Date	Brief Description of Change(s)
00	08/01/2019	Original Issue



CHEMICAL SPILL

1 Scope

Spill events are generally classified by the severity and nature of the spill. A minor chemical spill is one that the laboratory staff is capable of handling safely without the assistance of safety and emergency personnel. A spill that is too hazardous to be safely cleaned by laboratory personnel is a major spill. The range and quantity of hazardous substances used in the forensic laboratory requires preplanning to respond safely to spills.

2 Practices

2.1 General

- A. Spill kits containing absorbents, reactants, and protective equipment shall be available to clean up minor spills.
- B. All laboratory personnel must be aware of the location of spill kits.
- C. All laboratory employees who handle a particular material should be knowledgeable about the proper cleanup method for that material in case of a spill. PPE must be worn while performing spill cleanup.
- D. If a spill occurs and an employee is not aware of its particular hazard or the proper clean up method, a Safety Advisor, supervisor, or Quality Manager shall be consulted immediately.

2.2 Laboratory

Each lab shall:

- A. Have appropriate spill kits available and accessible.
- B. Identify high-risk or spill-prone areas in the lab.
- C. Know the maximum (worst-case) quantities of chemicals which could potentially spill at each location.
- D. Keep updated Safety Data Sheets (SDS) for all chemicals.
- E. Select the correct type of kit and cleanup accessories, based on the type of chemical in each area.
- F. Plan routes for best access to each location.
- G. Monitor kits and cleanup accessories to be sure they are fully maintained.

3 Chemical Spill

3.1 Chemical Spill Kit

Each laboratory shall maintain at least one chemical spill kit. Kits must contain appropriate absorbents, reactants, and protective equipment. Recommended supplies include:

- Universal Chemical Absorbent Pads (must be chemically inert and vapor suppressive)
- Universal Chemical Absorbent Powder (such as vermiculite)
- Neutralizing agents (such as sodium carbonate, sodium bicarbonate, or sodium bisulfate)



- Plastic scoop
- Trash bags
- Appropriate disposable laboratory gloves (Nitrile, vinyl, and latex gloves)
- Safety goggles
- Chemical waste labels
- Sealable puncture and leak resistant plastic container

3.2 Minor Liquid Chemical Spills

Depending on the nature of the chemical and location of the spill, it may not be necessary to follow this procedure for smaller spills.

1. Attend to injured or contaminated persons and remove them from the area.
2. Advise people in the vicinity of the nature of the spill. Restrict access to area to personnel involved in cleanup.
3. If spilled material is flammable, turn off ignition and heat sources.
4. Wear appropriate personal protective equipment, such as safety goggles, gloves, lab coat, and respirator.
5. Avoid breathing vapors from spill. If necessary, increase ventilation by turning on fume hoods and evacuate room or seal off spill area for as long as needed to allow aerosols to settle and vapors to be removed.
6. Confine spill to as small of an area as possible by placing absorbent material at edges of spill area. Spread enough powder over the spill to completely cover the liquid. If volatile or flammable material, use pads that are designed to suppress the vapors emitted by a volatile liquid.
7. Use appropriate kit to neutralize and absorb inorganic acids and bases. Collect residue with plastic scoop and place in container. Dispose as chemical waste. For other chemicals, use appropriate kit or absorb spill with vermiculite, dry sand, or diatomaceous earth. Collect residue, place in appropriate container with a completed hazardous waste sticker on container and dispose as chemical waste.
8. Clean spill area with water.

3.3 Major Liquid Chemical Spills

1. Attend to injured or contaminated persons and remove them from exposure.
2. Warn people in the building to evacuate.
3. If spilled material is flammable, turn off ignition and heat sources.
4. Close doors to affected area.
5. Evacuate the building using the building's evacuation plan.
6. Call chemical spill emergency response number. Be prepared to provide the following information:
 - a) *Your name and phone number*
 - b) *Identity of material spilled*



- c) *Location of spill including building address, room, and location within room*
 - d) *Time of spill*
 - e) *Amount of spilled material*
- 7. Have person knowledgeable of the incident and laboratory facility available to provide necessary information to emergency personnel.
 - 8. Lab personnel shall not re-enter building until cleared by emergency personnel and Quality Manager.

3.4 Minor Solid Chemical Spills

- 1. Use plastic scoop to place spilled material into chemical waste container. Caution must be used not to cause powders to become airborne.
- 2. After the bulk of the material is cleaned up, wipe area with paper towel or spill pad wet with water or a compatible liquid. If liquid other than water is used, further cleanup will be necessary to remove the solvent.
- 3. Dispose of spilled material and cleanup materials as chemical waste.

3.5 Incident/Accident Report

- A. All spills requiring clean up using one of these procedures shall be reported to the supervisor. The appropriate incident and/or accident reports shall be completed when applicable (e.g. Quality Incident report, injury/illness (exposure), medical, etc.) and a copy sent to the DPS Workers' Compensation Office and the Health and Safety Manager within 24 hours of the exposure.
- B. The following information shall be documented:
 - 1. Name of all persons who may have been exposed
 - 2. Identity of material
 - 3. Location of spill: building, room, location in room
 - 4. Time of spill
 - 5. Amount of spilled material
- C. The appropriate accident reports shall be completed when applicable (i.e. incident report, injury/illness (exposure), medical, etc.)

4 Records

Quality Incident Report (LAB-510) or electronic equivalent

Employer's First Report of Injury or Illness (WC-01)

Incident Report (WC-12)

Authorization for Release of Information (SORM-16)

Employee's Report of Injury (SORM-29)

Employee's Election Regarding Utilization of Sick & Annual Leave (SORM-80 – Non Commissioned)



Safety Manual

DRN: SAF-05-02

Subject: Chemical Spill

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Deletion Section 2.1 D Modification to Section 2.3 #8 "...cleared by emergency personnel, laboratory supervisor, and laboratory and quality manager." Addition Section 2.5 A, requiring notification of supervisor and completion of a quality action plan
02	05/01/2017	Major Revision Addition of contents of kit from SAF-05-06, Laboratory Practice Minor Revision other sections
03	08/01/2019	Revision – Sections 3 and 4



BIOLOGICAL SPILL

1 Scope

Spill events are generally classified according to the severity and nature of the spill. Biological spills outside of biological safety cabinets may generate aerosols that can be dispersed in the air throughout the laboratory. These spills can be very serious if they involve microorganisms, since many of these agents have the potential for transmitting disease. The range and quantity of hazardous substances used in the forensic laboratory requires pre-planning to respond safely to spills.

2 Practices

2.1 General

- A. All laboratory personnel must be aware of the location of spill kits.
- B. All laboratory employees who handle a particular material should be knowledgeable about the proper cleanup method for that material in case of a spill.
- C. If a spill occurs and an employee is not aware of its particular hazard or the proper clean up method, Safety Advisor, supervisor, or Quality Manager shall be consulted immediately.
- D. Depending on the nature/extent of the spill, evacuation and facility containment may be necessary.
- E. During clean up, use of particulate respirators such as disposable N95 or higher type or a powered air purifying respirator may be necessary.
- F. Appropriate personal protective equipment (PPE) is important in decontaminating spills involving microorganisms. PPE includes lab coat with long sleeves, back-fastening gown or jumpsuit, disposable gloves, disposable shoe covers, safety goggles, and mask or full face shield. Use of PPE will prevent contact with contaminated surfaces and protect eyes and mucous membranes from exposure to splattered materials.

2.2 Biological Spill

Each laboratory shall maintain at least one biological spill kit appropriate for the decontamination of spills or leaks of biological materials. Recommended supplies include:

- Nitrile and/or Latex gloves
- Rubber gloves
- Small disposable broom (or brush) with dustpan, tongs or forceps
- Biohazard bags
- Appropriate disinfectants may include a freshly prepared bleach solution (10%). Other examples of disinfectants may include those listed at the Environmental Protection Agency website or those identified as acceptable for DNA analysis. or .
- Mixing/spray bottle
- Paper towels or other absorbent material
- Spill pillows for large spills
- Safety goggles or face shield
- Sealable puncture and leak resistant plastic container



2.3 Biological Spill Cleanup

This procedure shall be followed for all biological spills greater than 5 mL. Depending on the location of the spill, it may not be necessary to follow this procedure for smaller spills.

1. Attend to injured or contaminated persons and remove them from the area.
2. If contamination occurs to exposed skin, wash with a liquid antimicrobial soap. Rinse well with warm not hot water to adequately flush contaminated material from the skin..
3. Warn people in the immediate area of spill. Restrict access to area to personnel involved in clean-up.
4. Wear appropriate PPE. Gloves, mask, respirator, face shield, glasses, and lab coat shall be worn during clean up. Additional protection such as safety goggles or face shield may be worn. Wear double gloves or heavy gloves when glass is involved in a blood spill.
5. Remove any glass or sharps by sweeping or using forceps, or tongs. (DO NOT USE YOUR HANDS TO PICK UP BROKEN GLASS!). Dispose of these materials in an appropriate biohazard sharps container.
6. Confine spill to as small of an area as possible by placing absorbent material at edges of spill area.
7. Absorb biological material using appropriate material, working from the edges into the center.
8. Apply an appropriate disinfectant to the contaminated surfaces with wet paper towels soaked with disinfectant or by flooding the area with disinfectant.
9. Dispose of spill material and used absorbent material in a biohazard bag for incineration or autoclaving.

2.4 Incident/Accident Report

- A. The appropriate incident and/or accident reports shall be completed when applicable (e.g. Quality Incident report, injury/illness (exposure), medical, etc.) and a copy sent to the DPS Workers' Compensation Office and the Health and Safety Manager within 24 hours.
- B. The following information shall be documented:
 1. Name of all persons who may have been exposed
 2. Identity of material
 3. Location of spill: building, room, location in room
 4. Time of spill
 5. Amount of spilled material

3 Records

Quality Incident Report (LAB-510) or electronic equivalent

Employer's First Report of Injury or Illness (WC-01)

Incident Report (WC-12)



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Authorization for Release of Information (SORM-16)

Employee's Report of Injury (SORM-29)

Employee's Election Regarding Utilization of Sick & Annual Leave (SORM-80 – Non Commissioned)



Revision History

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Modification to Section 2.2 "...it may <u>not</u> be necessary to follow this procedure for smaller spills." Modification to Section 2.2 #9 "...in a red <u>biohazard</u> bag...." Addition Section 2.3 A, requiring notification of supervisor and completion of a quality action plan
02	10/09/2006	Modification to Section 1 "... To reduce the risk of inhalation exposure in such an incident, occupants should hold their breath and leave the laboratory immediately. During this time the aerosol will be removed from the laboratory by the exhaust air ventilation system.... " Modification to Section 2.2 #2 "...washes first with a good liquid antimicrobial detergent soap...."
03	08/01/2019	Revision – All Sections



MERCURY SPILL

1 Scope

Spill events are generally classified according to the severity and nature of the spill. Mercury is very toxic to humans, even in the small amount found in a mercury thermometer. It is a volatile liquid and readily binds to other metals including gold or silver commonly found in jewelry. Mercury vapor is not irritating and has no odor. Therefore, mercury cleanup requires a special spill kit and procedures.

2 Practices

2.1 General

- A. Spill kits containing absorbents, reactants, and protective equipment shall be available to clean up minor spills. A major spill is considered more than approximately two tablespoons (or 1 pound), and it is the threshold volume for a reportable amount.
- B. All laboratory personnel must be aware of the location of spill kits.
- C. All laboratory employees who handle a particular material should be knowledgeable about the proper cleanup method for that material in case of a spill.
- D. A mercury spill must never be walked through, vacuumed (except with an approved mercury-specific vacuum), mopped, or swept as these actions could disperse the mercury into smaller particles. Never wash clothing or items that have come into direct contact with mercury or pour mercury down a drain. Leave contaminated clothing and footwear in affected area for proper disposal.
- E. If a spill occurs and an employee is not aware of its particular hazard or the proper clean up method, a Safety Advisor, supervisor, or Quality Manager shall be consulted immediately.

2.2 Mercury Spill Kit

Laboratories that have mercury thermometers or elemental mercury shall maintain a mercury spill kit. Recommended supplies include:

- Commercially available Mercury absorbent sponges
- Mercury absorbent powder (including sulfur or a commercially prepared powder)
- Plastic scoop
- Safety goggles or face shield
- Sealable puncture and leak resistant plastic container

2.3 Mercury Spills

1. Warn people in the immediate area of spill. Restrict access to personnel involved in clean-up. Ensure that all persons in the immediate area of the spill inspect shoes, clothing, jewelry, etc. to ensure they have not been contaminated.
2. If possible, ventilation systems such as heat or air conditioning that could recirculate air from the spill area to other parts of the building should be turned off. Close doors leading to other internal areas and open any exterior doors and windows to facilitate exhaust. If available in spill area, turn on fume hoods



to facilitate exhausting of room. Ventilation should be continued for approximately one day.

3. Protect sinks, floor drains and other metal objects from contamination. Any metals or other materials presumed to have been in contact with mercury should be considered contaminated. Place the items in a properly labeled plastic container.
4. If possible carefully combine and consolidate mercury droplets for efficient collection toward the center of the spill area away from any carpet, fabric, or porous surfaces.
5. Use one of the collection methods as appropriate:
 - a) *Clean the mercury spill with a commercially available mercury absorbent sponge.*
 - b) *Apply powdered sulfur or other mercury absorbent material over the spill area. Powdered sulfur forms a compound with mercury, reducing vapors and making the mercury more visible by turning from yellow to brown forming mercuric sulfide. Collect the material with the plastic scoop.*
 - c) *Vacuum the mercury spill area with a vacuum specifically designed for mercury use as necessary.*
6. Inspect the spill zone with a bright light to help illuminate any hidden droplets and repeat the collection procedure if necessary.
7. Transfer the mercury into a plastic, leak and puncture resistant, sealable container. Label the container as containing liquid mercury waste.

2.4 Incident/Accident Report

- A. All spills requiring clean up using one of these procedures shall be reported to the supervisor. The appropriate incident and/or accident reports shall be completed when applicable (e.g. Quality Incident report, injury/illness (exposure), medical, etc.) and a copy sent to the DPS Workers' Compensation Office and the Health and Safety Manager within 24 hours of the exposure.
- B. The following information shall be documented:
 1. Name of all persons who may have been exposed
 2. Identity of material
 3. Location of spill: building, room, location in room
 4. Time of spill
 5. Amount of spilled material
- C. The appropriate accident reports shall be completed when applicable (ie. incident report, injury/illness (exposure), medical, etc.)

3 Records

Quality Incident Report (LAB-510) or electronic equivalent

Employer's First Report of Injury or Illness (WC-01)

Incident Report (WC-12)



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Authorization for Release of Information (SORM-16)

Employee's Report of Injury (SORM-29)

Employee's Election Regarding Utilization of Sick & Annual Leave (SORM-80 – Non Commissioned)



Safety Manual

DRN: SAF-05-04

Subject: Mercury Spill

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Addition Section 2.1 pertaining to general considerations. Minor Revision and clarification 2.2 #4-7 Addition Section 2.3 A, requiring notification of supervisor and completion of a quality action plan
02	05/01/2017	Major Revision Addition of contents of kit from SAF-05-06 Minor Revision other sections
03	08/01/2019	Revision – Sections 2 and 3



GAS LEAK

1 Scope

All laboratories using flammable or toxic gases should have a plan for response to gas leaks. These are general steps for a gas leak emergency response.

2 Related Documents

Compressed and Liquefied Gas Safety (SAF-01-07)

3 Practices

3.1 General

The threat of a gas leak will be determined based on the amount of material which has escaped and the nature of material. If a sufficient amount of gas has already escaped for conditions to be immediately hazardous or if a leak occurs in the building's gas lines, the leak should be considered major. If the laboratory is uncertain, then the leak should be considered major as gases may be flammable or can potentially cause asphyxiation if the gas displaces oxygen.

3.2 Unusual or Out-of-Place Odor

1. Alert all individuals in the area.
2. Inform supervisor of the odor.
3. Supervisor or designee should attempt to determine the source of the odor.

3.3 Flammable Gas Leak

1. If the situation is life or health threatening or you are unsure, turn off ignition/heat sources if safe to do so, immediately evacuate the laboratory, and shut doors to the area.
2. Evacuate the building using the building's evacuation plan.
3. Be prepared to provide the following information to emergency response personnel:
 - a) *Your name and phone number.*
 - b) *Type of gas and size and/or amount of gas leak, if known.*
 - c) *Location of leak including building address, room, and location within room.*
 - d) *Approximate time leak was detected.*
4. Have person knowledgeable of incident and laboratory available to provide necessary information to emergency personnel.
5. Lab personnel shall not re-enter building until cleared by emergency personnel laboratory supervisor, and/or laboratory manager

3.4 Incident/Accident Report

- A. Gas leaks shall be reported to the supervisor. The appropriate incident and/or accident reports shall be completed when applicable (e.g. Quality Incident report, injury/illness (exposure), medical, etc.) and a copy sent to the DPS Workers'



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Subject: Gas Leak

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Compensation Office and the Health and Safety Manager within 24 hours of the exposure.

- B. The following information shall be documented:
1. Name of all persons who may have been exposed
 2. Identity of material
 3. Location of leak: building, room, location in room
 4. Cause of leak if known.
 5. Approximate time leak was detected
- C. The appropriate accident reports shall be completed when applicable (i.e. incident report, injury/illness (exposure), medical, etc.)

4 Records

Quality Incident Report (LAB-510) or electronic equivalent

Employer's First Report of Injury or Illness (WC-01)

Incident Report (WC-12)

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Subject: Gas Leak

Version #	Effective Date	Brief Description of Change(s)
00	02/01/2005	Original Issue
01	10/01/2005	Modification to Section 2.2 #3, "Supervisor or designee <u>should</u> will determine...." Modification to Section 2.3 #3 (d), " <u>Approximate</u> time of leak <u>was detected</u> detection ." Modification to Section 2.3 #5, "...emergency personnel, laboratory supervisor, and/or laboratory manager." Modification to Section 2.4 #5, " <u>Approximate</u> time leak was detected"
02	05/01/2017	Minor Revision Section 2, 3.1 and 3.3
03	08/01/2019	Revision – Sections 3 and 4



SAFETY INSPECTION

1 Scope

To provide a uniform basis for evaluation of laboratory readiness for safety and risk management responses.

2 Responsibility

Laboratory Safety Advisor or designee is responsible for conducting inspection and evaluation

Quality Manager is responsible for responding to and reviewing safety inspections

3 Practice

3.1 Frequency

The laboratory safety advisor or designee shall conduct at least two yearly inspections of the laboratory

3.2 Criteria

The following items shall be subject to the safety inspection of a Crime Laboratory in order to determine that the criteria has been met or is available and in satisfactory condition:

1. Safety Manual must be available and current.
2. Documented training (including first aid, CPR, in-service, safety videos) conducted annually.
3. "Texas Hazard Communication Act Notice" must be posted.
4. Evacuation plan (including at least two unobstructed exits, routes, and a designated collection point) clearly posted.
5. Exit signs in place and operational
6. List of chemicals on-hand and stored safely.
7. Material Safety Data Sheets available both current and archive.
8. Chemicals storage (including: proper storage/segregation, and flammable cabinet) evaluate on walk-through in accordance with good laboratory practices.
9. Laboratory general appearance (including: floors clean, trash, "trip" hazard, fire hazard, etc.) evaluate on walk-through.
10. Availability of personal protective equipment (PPE), such as safety glasses, gloves, ear protection (where needed), and lab coats
11. Safety emergency lights are present and functional.
12. Fume hood shall have an unobstructed flow and a minimum face velocity of 60 linear feet minutes.
13. Biological hood shall be in good operating condition and certified annually.
14. Self-contained breathing apparatus (if present) should be in good operating condition and have a current inspection.



15. Fire safety devices (including: appropriate fire extinguishers, fire alarm/control devices, fire blankets, etc.) shall be available with a current inspection.
16. First aid kit available and current
17. Safety shower should have a flow rate of at least 20 gallons/minute.
18. Eyewash should be in good operating condition.
19. Solvent Spill clean-up kits for acids and bases located near solvent use areas and reagents current. Other spill clean-up kits as appropriate (such as mercury and biological spill kits)
20. Gas cylinder fastening devices. New construction should isolate bottles from the laboratory or make allowances for cabinets for flammable gas with positive flow ventilation or equivalent.
21. Belt guards on vacuum pumps should be in good operating condition.

3.3 Documentation and Review

1. The inspection will be documented on the laboratory safety checklist.
2. The Quality Manager should review and approve.
3. If a topic is not applicable to a particular laboratory, it should be indicated as such in the comments field on the Laboratory Safety Checklist.
4. A copy of the checklist will be forwarded to the Quality Assurance Unit and the adjutant or facility manager.

4 Records

Laboratory Safety Checklist (LAB-SAF-01)



Revision History

Version #	Effective Date	Brief Description of Change(s)
	07/01/2001	Original Issue
01	12/01/2003	Major Revision
02	02/01/2005	Modification to Section 2 " <u>Laboratory</u> Safety Officer <u>Advisor</u>" Modification to Section 3 A " <u>Laboratory</u> Safety Officer <u>Advisor</u>" Modification to Section 3 B #17 "...flow rate of at least 20 30 gallons/minute." Modification to Section 3 C #4 "...copy of the checklist <u>will</u> should be forwarded...."
03	10/01/2005	Modification to Section 3.2 #12, "Fume Hood <u>shall have an evaluate</u> for unobstructed flow and a face velocity of 60-150 linear feet minutes velocity using a velometer. Modification to Section 3.2 #12, "Biological Hood should <u>shall</u> be in good operating condition and certification <u>certified</u> annually." Modification to Section 3.2 #15, Fire safety devices (including: appropriate fire extinguishers, fire alarm/control devices, fire blankets, etc.) should <u>shall</u> be available with a current inspection. Modification to Section 3.2 #20, "...for Capee cabinets for flammable gasses...." Modification to Section 3.3 #4, "A copy of the checklist will be forwarded to the Quality Assurance Unit <u>and the adjutant or facility manager.</u> "
04	10/09/2006	Modification to Section 3.2 #1 "Safety Manuals (including safety, chemical hygiene, and exposure control) <u>must be</u> available and current." Modification to Section 3.2 #3 " <u>Texas</u> Hazard Communication Act <u>Notice</u> ' must be posted."
04a	08/01/2019	Administrative Revision – Changed issuing authority to System Quality Manager



TEXAS DEPARTMENT OF PUBLIC SAFETY
CRIME LABORATORY

Laboratory Safety Checklist

LAB-SAF-01 Rev.02 (08/2019) p.1 Issued by: SQM

Laboratory	Inspector	Inspection Date(s)
	Manager	Review Date

Criteria	Available	Satisfactory Condition	Comments
Safety Manuals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Documented Site-Safety Training	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Hazard Communication Act	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Evacuation Plan	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Chemical List	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
MSDS/SDS	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Exit Signs	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Chemical Storage	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Laboratory General Appearance	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Personal Protective Equipment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Safety Emergency Lights	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Fume Hood(s), Chemical	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Fume Hood(s), Biological	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Self-Contained Breathing Apparatus	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Fire Safety Devices	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
First Aid Kit(s)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Safety Shower(s)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Eyewash Station(s)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Spill Cleanup Kit(s)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Gas Cylinder Fastening Devices	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Narcan (Naloxone) Kit(s)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Defibrillator(s)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Annual Fire Drill Conducted			<input type="checkbox"/> Yes <input type="checkbox"/> No Date conducted: _____

Additional Criteria	Condition	Comments



TEXAS DEPARTMENT OF PUBLIC SAFETY
CRIME LABORATORY

Hepatitis B Vaccination Declination

LAB-SAF-02 Rev.01a (08/2019) p.1 Issued by: SQM

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Employee Signature _____

Date _____

Print Name _____

Witness Signature _____

Date _____

Print Name _____



TEXAS DEPARTMENT OF PUBLIC SAFETY
CRIME LABORATORY

Building Emergency Information

LAB-SAF-03 Rev.01a (08/2019) p.1 Issued by: SQM

ALL EMERGENCIES - Chemical, Medical, or Fire.....911 OR 9-911

DPS Campus Security

Laboratory Manager

Laboratory Safety Advisor.....

Radiation Safety Advisor.....

DPS Risk Management.....

Hazardous Materials (HAZMAT)

Building Location
Assembly Site

Evacuation Responsibility	Name and extension
Building Evacuation Coordinator (alternate) (alternate)	
1 st Floor Evacuation Coordinator (alternate) Evacuation Buddy	
2 nd Floor Evacuation Coordinator (alternate) Evacuation Buddy	
3 rd Floor Evacuation Coordinator (alternate) Evacuation Buddy	
4 th Floor Evacuation Coordinator (alternate) Evacuation Buddy	



TEXAS DEPARTMENT OF PUBLIC SAFETY
CRIME LABORATORY

Annual Safety Awareness Training

LAB-SAF-07 Rev.00a (08/2019) p.1 Issued by: SQM

Lab		Presentation Date(s)		Page 1 of 1
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Safety Topic(s)	Delivery Format	Title	Length

Comments:

Personnel in attendance:

