A. PURPOSE:

a. It is the goal of the Division of Scientific Services Laboratory to provide a safe working environment for all employees. To achieve this goal all employees must adhere to the guidance set forth in the safety manual and work in a safe manner.
b. The DSS laboratory has specialized safety concerns per specific units. The safety program addresses general laboratory safety topics. Unit specific procedures address safety concerns unique to that unit. The General Laboratory Safety Manual addresses safety issues through:
    i. General Safety Guidance.
    ii. Biological and Bloodborne Pathogens Plan.
    iii. Chemical Hazard Plan.
    iv. Instrument and Mechanical Hazards guidance.
    v. Fire Safety guidance.
    vi. Inspection & Compliance plan.
    vii. Medical Surveillance guidance.
    viii. Safety Training guidance.

B. RESPONSIBILITY:

a. Managers: Responsible to provide direction to subordinate staff under their purview as indicated by the organization chart.
b. Supervisors: Responsible to provide supervision to subordinate staff under their purview as indicated by the organization chart.
c. FSE2: responsible as a working lead to subordinate staff as indicated on the organizational chart.
d. FSE1, FSE, FCA, Chemist, CCT, ECO, Lab Assistants and Support Personnel: Responsible to adhere to this procedure as it pertains to their Unit.
e. All DSS employees are responsible to work in a safe manner.
f. Safety Officer: designated by the Director, will work to ensure safety guidelines set forth in this safety manual are met and will work to improve the safe working conditions when deficiencies are identified, or new hazards are presented. The Safety Officer will head the Safety Committee and:
    i. Promote, plan, and direct a regular program of safety inspections.
    ii. Check for compliance with applicable safety laws and codes.
    iii. Maintain accident records.
    iv. Develop and conduct safety education activities for all levels.
    v. Ensure adequate preventive maintenance programs by assessing risks and identifying opportunities for improvements to the safety program.
    vi. Establish and maintain emergency plans.
    vii. Be responsible for the maintenance of current safety knowledge.
g. Safety Committee: will work with the Safety Officer to maintain and improve the safety conditions specifically in the areas they represent as related to Bloodborne Pathogen and

chemical hygiene. They will monitor the safety program as it pertains to the specific areas they represent.

C. GENERAL SAFETY:

a. Submissions to the Department of Emergency Services and Public Protection Division of Scientific Services may include samples that contain substances that are toxic, carcinogenic, and biologically or otherwise hazardous to humans. The hazard of such samples will vary according to:
   i. The nature and concentration of the infecting agent
   ii. The routes by which the contamination can be transmitted; (e.g. respiratory, alimentary, absorptive) and the susceptibility of the exposed laboratory worker.

b. Each specimen should be considered to be a potential hazard and handled appropriately as to protect the analyst or others.
   i. Common routes of contamination include:
      1. Absorption, certain chemicals and drugs absorb directly through the skin.
      2. Open cuts or scratches on the skin, particularly the hands, provide a point-of-entry for infectious agents. Penetration of intact skin is possible by some infecting agents and chemicals, while others may enter through the conjunctiva of the eye or other mucous membranes as a result of contact with contaminated hands.
      3. Direct physical contact by handling wet or dry samples (since all physiological stains should be regarded as potentially infectious), as well as the splashing of liquids, are a frequent means of contamination.
      4. Direct Inoculation
         a. Broken glassware, needles, syringes, forceps, and other sharp objects provide a direct means of injection of infecting agents into the bloodstream.
      5. Vectors
         a. Ticks, fleas, body lice, and other ectoparasites on physical evidence are potential sources of contamination.
      6. Ingestion
      7. Smoking, eating, or drinking after handling evidence specimens and prior to hand washing may result in oral ingestion of infective agents or hazardous chemicals.
      8. Aerosols, infectious agents may become airborne through a variety of laboratory procedures and accidents. Proper ventilation or breathing protection is imperative.

c. <u>General Protective Measures</u>:
   i. Protective measures against a particular infectious agent that may be encountered in the laboratory should be directed primarily against the main route of transmission and against subsequent modes of secondary contamination. Because of the dose-response effect, preventive measures should concentrate first on sources from which

the infecting dose of the hazard is likely to be greatest, although these measures must also be reinforced by a general attention to laboratory cleanliness and hygiene.

ii. To minimize exposures, scrutiny of the relative hazards involved with different laboratory procedures at different stages in the various procedures will be considered.

iii. Chemical exposures related to reagent usage and evidence handlings are similar to modes of transmission of the biological pathogens encountered. Therefore, most of the recommendations in the guidelines which follow are applicable both to chemical and biological risks, keeping in mind that any combination of the protective measures would be expected to deal with many of the other infection hazards that may be encountered.

d. Personal Protective Equipment (PPE): The following recommendations are based on the premise that avoiding contamination is largely a matter of organization, housekeeping, personal hygiene, technique and discipline. All personal protective equipment is provided at zero cost to the employee.

e. Safety Equipment includes but may not be limited to:

i. Eyewash and emergency shower stations should be:

1. Accessible and near area of need
2. Plumbed whenever possible
3. Paddle operated
4. Flushed on a regular basis
5. Where plumbed eyewashes are not available disposable eyewash solutions will be provided.

ii. Safety glasses, goggles and face shields are available to each employee.

iii. Disposable laboratory coats are provided to each employee. Disposable aprons may be used in conjunction with laboratory coats.

iv. A First Aid kit, appropriate to laboratory needs, is readily available in each work area.

1. Anyone using supplies from a first aid kit must report to their safety committee representative when supplies are needed for the kit.

v. Available types of gloves include:

1. Those which allow tactile sensitivity for routine evidence handling
2. Chemical resistant
3. Non-asbestos hot gloves
4. Puncture resistant gloves

vi. Hearing protection is available and worn in compliance with OSHA standards for hearing protection.

vii. Fume hoods and powder safe hoods are engineering controls; these work to contain fumes or airborne powder.

f. General Elements of Safe Operation**:**

i. There are elements common to both biological and chemical hazards that are key elements of safe laboratory behavior. Though each may be elaborated upon, collectively they form a structure of prudent laboratory operation.
ii. The elements of safe operation include:
    1. When handling potentially harmful agents, DSS staff must wear clean laboratory coats in the laboratory work areas as a barrier. Appropriate clothing should be worn to minimize skin that is not protected by the laboratory coat. Legs should be covered to the ankle.
        a. Laboratory coats must be removed prior to leaving the laboratory work areas unless the examiner is transporting material from one work area to another.
        b. Laboratory coats shall not be worn when entering lunchrooms or other areas where food may be stored or consumed, such as offices.
        c. Laboratory coats shall not be worn in the administrative area of the Division.
        d. Laboratory coats shall not be worn in bathrooms.
    2. Disposable sleeves are available to use over lab coats. Disposable sleeves are changed frequently to help protect evidence that requires DNA testing**.** Disposable sleeves or cuffed laboratory coats will be worn when handling cases expected of containing powdered fentanyl or its analogues.
    3. Safety glasses, goggles or face shields, appropriate to prevent against injury, shall be worn where mechanical, splash, airborne, chemical, or radiation hazard to the eye exists.
    4. Safety goggles should be worn when wearing contact lenses in laboratory areas.
    5. Eye protection against ultraviolet, infrared, and laser radiation shall be worn where applicable.
    6. When appropriate, facemasks shall be worn when examining evidence. In sections that may share evidence with DNA, unit personnel will use facemasks to protect the evidence from contamination. Other units may find it appropriate to wear facemasks due to the hazard the evidence may cause them. For example, in the Controlled Substance unit, analysts shall wear facemasks when handling cases consisting of bulk amounts of fine powders so they do not inhale the powder.
    7. No perforated or open-toed shoes are to be worn.
    8. When working with equipment that has moving parts avoid items that can catch in the equipment (examples: loose lanyards, jewelry). Long hair should be tied back.
    9. When handling potentially hazardous materials, open cuts or sores should be covered.
        a. Gloves shall be worn at all times when handling hazardous materials.

i. The type of glove used should be specific for the hazard being handled (consult manufacturer's specifications).

b. Gloves must be removed prior to leaving the laboratory work area. Gloves should not be worn when using equipment outside of the work areas (e.g. computers, copiers, etc.).
    i. When transporting "work product" in racks from one laboratory room to another analysts may wear gloves. This is due to the need of protecting the samples.

c. When gloves are removed, analysts will wash their hands prior to touching common items, such as phones or door handles.
    i. In areas where sinks are not available, hand sanitizing solution will be available for use. Sanitizing solutions should not be used in conjunction with powdered casework as this may facilitate absorption through the skin.

d. Analysts should avoid touching their face or other unprotected areas with their hands (or gloves). Hands should be washed frequently to prevent cross-contamination.

10. Routinely used utensils and biohazard contaminated materials (e.g. glassware, spatulas or other equipment) shall be sanitized in an appropriate manner. Each unit determines the most appropriate methods for cleaning equipment.
11. All examination areas shall be periodically cleaned with a disinfectant solution or at least a 10% bleach solution, as appropriate. Each unit determines the most appropriate method for cleaning examination areas.
12. Benches and equipment visibly contaminated with biological materials (blood, urine, emesis etc.) will be washed immediately with a disinfectant solution or at least a 10% bleach solution.
13. Broken or chipped glassware and scalpel blades shall be disposed of in appropriate containers. Scalpels, contaminated broken glassware and syringes must be disposed of in designated biohazard containers so as to eliminate accidental injury. Broken or chipped glass that is not expected to be contaminated, must be disposed of in glass disposal boxes.
14. No sharps or visibly contaminated gloves shall be placed in the regular trash. Specially designated containers, which will be sealed and removed periodically from the work area, are provided for all contaminated items of chemical or biological hazards and sharps.
15. Sharps (such as syringes with or without needles, razors, broken glass etc.) must be placed in plastic, puncture resistant leak proof containers.
16. Items that may have come in contact with potentially hazardous materials (such as gloves, bench coverings, pipette tips etc.) must be disposed of in biohazard containers if they are visibly contaminated.

17. Gloves that are not visibly contaminated may be disposed of in the regular trash. Employees must use good judgement when disposing of gloves.
18. When using vortexes or centrifuges, the tubes or chamber should be covered to prevent aerosol contamination. Any spills that occur must be cleaned immediately with a disinfectant solution or at least a 10% bleach solution.
19. Where practical, procedures involving airborne or vaporous hazardous substances should be performed in fume or powder safe hoods. Hazardous chemical spraying shall be done in a fume hood.
20. No oral pipetting of any substance is permitted. Avoid placing objects that may become inadvertently contaminated (pens, pencils, toothpicks) into the mouth.
21. No eating or drinking is permitted in the laboratory work areas or areas where hazard of contamination exists. No food or implements used for the consumption of food (cups, utensils etc.) will be stored in the analytical areas or in an evidence storage refrigerator/freezer. No implements used for the consumption of food (cups, utensils etc.) will be brought into laboratory work areas.
22. Personal items such as cell phones, backpacks and purses will not be brought into lab spaces.
23. Analytical, clerical, and evidence reception areas subject to evidence contamination must be kept clean and periodically disinfected. All employees in these areas are expected to maintain their own work areas so that they are clean and do not present a health concern or a cross contamination hazard to any evidence.
24. In applicable units, sinks and work areas designated for biological cleanup and sterilization shall have necessary bleach, soaps and cleaning solutions available and cleaned periodically.
25. Materials treated with potentially dangerous chemicals shall be well labeled and packaged to prevent contamination by subsequent handlers.
26. Any chemical or biological evidence shall be stored or handled with consideration to the hazards they represent as well as their security as evidence.
27. Spills will be immediately cleaned and disposed of properly.
28. As effects are compounded by exposure, it is recommended that as few employees as are necessary be subjected to potential hazards; therefore:
    a. Liquid biological sample analysis rooms are separate from routine analysis areas in the Forensic Biology unit.
    b. Appropriate safeguards for removal of biological hazards will be followed.
29. Any employee who detects a possible hazard should immediately report it to the Unit Manager or the Safety Officer or designee for appropriate action.

30. Personnel are to be trained to handle chemical and biological materials. Specific training will be part of the Unit specific training SOPs.
31. The current version of the Safety Manual will be made available to employees, electronically or in paper form, in the rare event they perform work outside of the DSS facility.

D. BIOLOGICAL SAFETY AND BLOODBORNE PATHOGENS

Beyond the fundamental safeguards already mentioned are concerns specific to biological threats. This section serves to identify biological hazards and outline additional safety procedures.

a. Bloodborne pathogens are pathogenic microorganisms that are present in human blood and body fluids and can cause disease in humans. These pathogens include, but are not limited to, Hepatitis B virus and Human Immunodeficiency virus (HIV). Hepatitis vaccinations are available to all employees of the Division.
    i. It is suggested that all employees have this vaccination.
    ii. Those refusing the vaccine must sign a refusal waiver.
b. Universal Precautions:
    i. An approach to infection control assumes that all items are contaminated with a blood borne pathogen and should be handled in a manner which prevents the spread of that pathogen. In the DSS laboratory the source of the evidence is not always known. An item which "looks" clean may be contaminated with blood, semen, fecal material or other biological material. Any piece of evidence that may contain biological material shall be considered potentially infectious, and universal personal protective measures should be taken.
    ii. Masks and safety glasses/goggles are available for use when there is a threat of blood particles becoming airborne (e.g. scraping down of evidence, vortexing, pipetting, centrifuging).
    iii. Laboratory coats and gloves will be worn while handling all biological fluids and any items/evidence which could be potentially contaminated with biological fluids.
    iv. Vials of blood (whole blood or serum) submitted for examination should be opened in a manner to avoid spraying of the blood or breaking of the glass vial.
        1. A splashguard (tissue or other device) should be placed over the stopper as it is removed. The presence of the tissue will aid in absorbing any spray that may occur.
        2. Open tops away from the body to minimize possible exposure.
        3. Blood samples can be examined in hoods when appropriate to do so. The use of hoods does not preclude the use of other appropriate PPE.
    v. Available Personal Protective Equipment:
        1. Puncture resistant gloves
        2. Goggles
        3. Face shields
        4. Physical barriers (Plexiglas counter top shields)
        5. Facemasks

6. Disposable arm sleeves
7. Laboratory coats

vi. Any areas of the body (other than eyes) that have been exposed to potentially infectious blood or body fluids should be thoroughly washed with soap and tepid water. If a biological fluid splashes in the eyes, flush using an eyewash, for 15 minutes. The individual must notify their Lead and the Safety Officer of any exposures that occur.
    1. Note if wearing contact lenses these should be removed prior to flushing the eye to allow the water to better contact the eye.

vii. Work areas and equipment (bench tops, pipettes etc.) exposed to blood or other bodily fluids will be washed with a disinfectant solution or a solution of at least 10% bleach.
    1. 10% bleach solutions need to be made within 24 hours of use to be fully effective.
    2. Stabilized bleach may also be used.

viii. Areas that work with biological fluids will have a plan in place for disinfecting work areas on a regular basis.

ix. Other Biological Hazards:
    1. Improperly dried plant materials submitted for analysis may contain *Aspergillus* molds. These molds are a common environmental contaminant; however, some species are known to cause diseases in man. Analysts working directly with plant materials that appear moldy may choose to wear facemasks to minimize exposure.

E. CHEMICAL HAZARD PLAN:

A variety of chemicals are used within the DSS laboratory. These can range from acids, bases and solvents to drugs and poisons. Some evidence may also be in chemical form such as with fire debris or drug cases. All chemicals must be handled in a safe manner to avoid exposures or cross-reactions.

a. General Chemical Hygiene:
    i. All chemicals will be handled in a safe manner. The SDS should be used for guidance when working with unfamiliar chemicals. Whenever possible the chemicals will be stored in a manner consistent with the storage guidelines in the specific SDS.

b. Safety Data Sheets (SDS):
    i. SDS sheets are located within the QMS. These are found on the Document tree in a folder labeled “Safety” under a sub-folder named “Safety Data Sheets”. Units may choose to have a subfolder within this folder with the SDS related to the work of the unit.
        1. Safety Data Sheets, paper or electronic versions, will be maintained by the DSS per OSHA guidance for a minimum of 30 years.

ii. Safety guidelines must be followed when working with chemicals. Employees that are unsure of how to safely work with a specific chemical should contact their Supervisor, Lead or the Safety Officer. General safe handling of chemicals includes:
    1. Wear laboratory coats
    2. Wear appropriate gloves, not all gloves are appropriate for all jobs. Consider:
        a. Type of chemical being used
        b. Prolonged exposure to the chemical v. incidental exposure
        c. Are gloves needed to protect skin from cold for liquid nitrogen use?
    3. Wear eye protection when there is the possibility of violent reactions, splashing or aerosolizing powder materials
    4. Store chemicals properly
    5. Store chemicals at eye level or lower
    6. Understand chemical incompatibility

c. <u>Precautions for Chemical Handling</u>:
    i. Handling and Weighing:
    Dangerous or hazardous chemicals, as identified by the NFPA (National Fire Protection Association) label or GHS (Globally Harmonized System) label, will be weighed and handled according to the following procedures:
        1. Wear appropriate PPE including:
            a. Proper gloves
            b. Face mask
            c. Laboratory coat
            d. Eye protection
        2. Minimize exposure in weighing procedure.
        3. Open reagent bottles at arm's length, angled away from the face.
        4. Store chemicals in close proximity to balance and return them to their storage area immediately after use.
        5. Use disposable weighing papers and/or boats, and discard into lined wastebasket after use and rinsing.
        6. Balances and work surfaces should be cleaned immediately after weighing.
        7. Utensils should be cleaned immediately after use.
    ii. When weighing evidence that may contain potential chemical hazards (e.g. opioids), the guidance above (Chemical Handling) will be followed.
        1. Powder safe hoods are available in the Controlled Substances and Latent Prints Units. These hoods should be used when evidence suspected of containing fentanyl (or other similar opiate) must be manipulated in a way that may cause the powder to become airborne.
            a. Examples:
                i. Latent Print: when the packaging needs to be peeled from a compressed brick of a drug.
                ii. Controlled Substances: when a powdered drug is to be removed from its packaging for weighing.

d. Reagent Usage:
    i. Analyses should be performed under appropriate ventilation. Reagents routinely used in the hood in small quantities may be stored there, provided they do not clutter the work surface or impede airflow. The use of personal protective devices should be considered. Rubber droppers should be inspected periodically and replaced as needed.
    ii. Liquid Nitrogen:
        1. When handling liquid nitrogen appropriate gloves, safety goggles and lab coats will be worn.
e. Hazardous Storage Precautions:
    i. This section serves to identify hazards and outline additional safety procedures. Potential hazards and their nature and storage are listed below. Prior to using any chemical or hazardous substance, the examiner will review the SDS sheets and manufacturer's recommendations for the use, storage and disposal of the material.
    ii. The quantity of toxic chemicals stored should always be kept to a minimum. For storage of solvents, the area shall be well ventilated and kept cool. Chemicals that react to produce toxic by-products must not be stored in the same area. Flammables, acids, and water-reactive substances are examples of special storage problems (see "Incompatible Chemicals").
    iii. Chemical storage areas must be kept free of clutter. Whenever possible items not related to chemical use will not be stored with the chemicals.
f. Hazard Classifications:
    i. Biohazards - acute or chronic health hazards other than carcinogens e.g. poisons, irritants, etc.
    ii. Carcinogens - mutagenic (agents which can induce a genetic mutation) and teratogenic (agents which are able to disturb the growth and development of an embryo or fetus)
        1. It is realized that it is sometimes necessary to store and use known carcinogens in the laboratory. This should be kept to a minimum.
        2. Probable agents, such as o - toluidine powder, should be stored and handled so as to reduce exposures.
    iii. Corrosives - Caustic agents, acids, bases, oxidizing agents.
        1. Acids, bases:
            a. Concentrated acids and bases should not be stored together or in the presence of other organic and inorganic chemicals. Many units have chemical storage areas within the work area (solvent cabinets, acid cabinets) for proper chemical storage.
            b. Corrosive liquids: should be stored in an area that is cool but maintained above the freezing point of the chemical. This area should be dry and well ventilated.
            c. Acids: should be stored in acid cabinets separate from hydrocarbon solvents.

2. Oxidizing Agents:
    a. The storage area for strong oxidizing agents is fire - resistant (shelving included) and cool. The floor of the storage room is fire resistant, watertight, and without cracks in which these materials can lodge. Oxidizing agents are not stored in the same area with any fuel such as: flammable, organic chemicals, dehydrating agents, or reducing agents. Oxidizing agents should be stored in a flammable proof cabinet in the chemical storeroom. Any spills in the storage area are cleaned immediately.

iv. Explosives:
1. Storage facilities for explosive chemicals are well identified and isolated from other chemicals. The type of storage area required depends upon the particular chemical and the quantity stored. Explosive chemicals will be stored in a vented cabinet in the chemical storeroom. For the proper storage methods of these chemicals, see the SDS sheets. If explosive standards or pure explosives are to be kept in the laboratory, the necessary quantity maintained shall be kept at a minimum.

v. Flammables:
1. Flammable liquids in quantities greater than four (4) liters are stored in metal safety cabinets in work areas or basement explosion protection room. Working stock solution will be stored in unit work areas.

vi. Solvents:
1. Hydrocarbon, chlorinated: excess quantities should be stored in storage cabinets in the chemical storeroom.

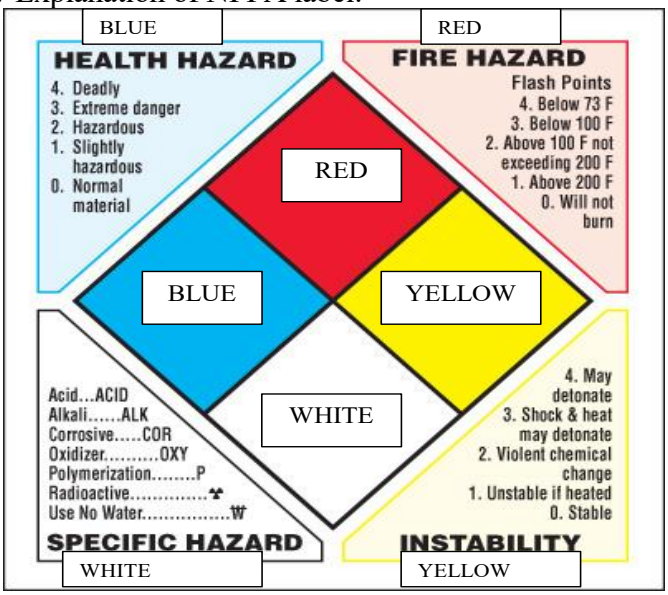
g. Chemical Labeling:
i. Regulations require that chemical hazards be communicated.
ii. Information needed to apprise the analyst of the chemical hazard may be on every chemical storage container or the hazards may be communicated via placards or a Chemical Hazard Binder specific to each laboratory space.

1. Chemicals received by the DSS are labeled by the manufacturer, to meet the GHS guidance. These labels will be maintained, as provided, while the chemical remains in the manufacturer's container. The date of receipt and date opened should be added to these labels.
2. For chemicals that are stored in containers other than the original containers (i.e. working containers), they will be labeled to identify:
    a. Name of Chemical (common)
    b. Manufacturer's lot number
    c. Initials of person performing the transfer
3. For in-house prepared reagents, the container must be labeled with:
    a. Name of Chemical (common)
    b. Date prepared or lot number

c. Preparer's initials

4. To communicate chemical hazards associated with chemicals used within Units, the Unit may choose to either:
   a. Add NFPA diamonds to the label
   b. Add GHS pictograms to the label.
   c. Use clearly located placards posted in areas where chemicals are used. OR
   d. Maintain a clearly identified, centrally located Chemical Hazard binder. This must be readily available to all users of the chemicals or reagents.
   Note that units may use a combination of these based on the needs of the Unit or work performed.
5. Solutions prepared, used and discarded in the same day are only required to be labeled with the identity of the solution.
6. Individual units may require additional information on the reagent, such as expiration date, this is unit specific and will be addressed in the specific unit SOPs.

iii. Explanation of NFPA label:



iv. Global Harmonized System (GHS) of labeling: this system is part of the OSHA Communication program. Manufacturers of chemicals are required to use this labeling system. The following is provided for users of chemicals to understand the labeling system.

The complete GHS guide: 'A Guide to the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)' is available in the QMS under the 'Safety" Folder in the sub-folder 'References'.

1. Manufacturer's Labels are required to contain the following information:
    a. Product Identification: this is simply the common name, trade name, or chemical name of the product.
    b. Pictogram: there are 9 standard pictograms. These will always be a red diamond on a white background. Multiple pictograms will commonly be on a single label.

Indicates an explosive, self-reactive or organic peroxide type substance.

Indicates Acute Toxicity

Indicates flammable, self-reactive, pyrophoric, self-heating, or a substance that emits a flammable gas.

Indicates Irritants, Dermal sensitizers, acute toxicity, narcotic effect, respiratory tract irritant.

Indicates Oxidizers, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.

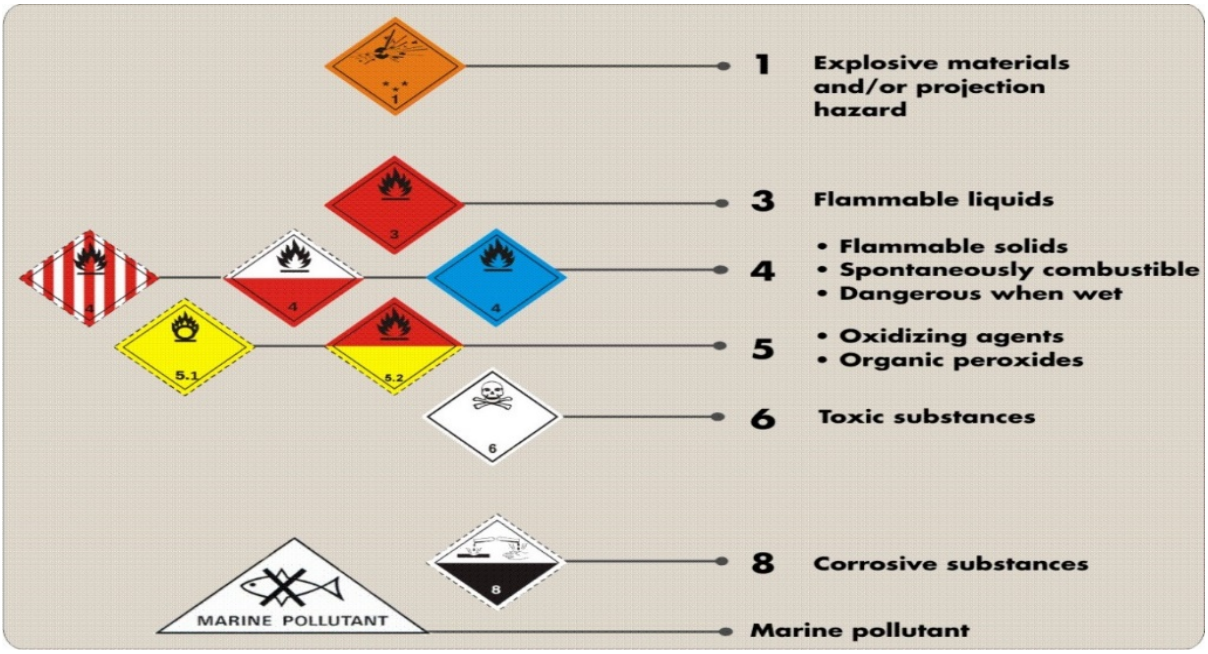
Indicates Health Hazard, respiratory Sensitizer, Reproductive Toxicity, Target organ toxicity, Mutagen, Aspiration Toxicity.

Indicates Gas under pressure

Indicates Environmental Toxicity

Indicates Corrosive

c. Transportation pictorgrams (these will be on shipping containers):



2. Signal Word: There are 2 signal words.
    a. Danger: Indicates a more severe hazard.
    b. Warning: Indicates a less severe hazard.
3. Hazard Statement: hazard statements are standardized and assigned phrases that describe the hazard(s) as determined by hazard classification. An appropriate statement for each GHS should be included on the label for products possessing more than one hazard.
    a. Physical Hazards:
        i. Explosives
        ii. Flammable Gases
        iii. Flammable Aerosols
        iv. Oxidizing Gases
        v. Gases Under Pressure
        vi. Flammable Liquids

vii. Flammable Solids
viii. Self-Reactive Substances
ix. Pyrophoric Liquids
x. Pyrophoric Solids
xi. Self-Heating Substances
xii. Substances which, in contact with water emit flammable gases
xiii. Oxidizing Liquids
xiv. Oxidizing Solids
xv. Organic Peroxides
xvi. Corrosive to Metals

b. Health Hazards:
   i. Acute Toxicity
   ii. Skin Corrosion/Irritation
   iii. Serious Eye Damage/Eye Irritation, Respiratory or Skin Sensitization
   iv. Germ Cell Mutagenicity
   v. Carcinogenicity
   vi. Reproductive Toxicology
   vii. Target Organ Systemic Toxicity - Single Exposure
   viii. Target Organ Systemic Toxicity - Repeated Exposure
   ix. Aspiration Toxicity
c. Environmental Hazard:
   i. Hazardous to the Aquatic Environment
   ii. Acute aquatic toxicity
   iii. Chronic aquatic toxicity
      1. Bioaccumulation potential
      2. Rapid degradability
d. Precautionary statement: precautionary information supplements the hazard information by briefly providing measures to be taken to minimize or prevent adverse effects from physical, health or environmental hazards. First aid is included in this statement.
e. Supplier Identification: the name, address, and phone number of the manufacturer or supplier of the product.

h. Safety Data Sheets (SDS):
   i. Safety Data Sheets are documents that contain information and instruction concerning chemicals. These are used to comply with OSHA's Hazard Communication Standard.
   ii. Under the GHS, SDS are required to contain 16 specific headings. From the GHS Guide:

1.	**Identification of the substance or mixture and of the supplier**	• GHS product identifier. • Other means of identification. • Recommended use of the chemical and restrictions on use. • Supplier's details (including name, address, phone number, etc.). • Emergency phone number.
2.	**Hazards identification**	• GHS classification of the substance/mixture and any national or regional information. • GHS label elements, including precautionary statements. (Hazard symbols may be provided as a graphical reproduction of the symbols in black and white or the name of the symbol, e.g., flame, skull and crossbones.) • Other hazards which do not result in classification (e.g., dust explosion hazard) or are not covered by the GHS.
3.	**Composition/information on ingredients**	**Substance** • Chemical identity. • Common name, synonyms, etc. • CAS number, EC number, etc. • Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance. **Mixture** • The chemical identity and concentration or concentration ranges of all ingredients which are hazardous within the meaning of the GHS and are present above their cutoff levels. ***NOTE**: For information on ingredients, the competent authority rules for CBI take priority over the rules for product identification.*
4.	**First aid measures**	• Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion. • Most important symptoms/effects, acute and delayed. • Indication of immediate medical attention and special treatment needed, if necessary.

5.	**Firefighting measures**	• Suitable (and unsuitable) extinguishing media. • Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products). • Special protective equipment and precautions for firefighters.
6.	**Accidental release measures**	• Personal precautions, protective equipment and emergency procedures. • Environmental precautions. • Methods and materials for containment and cleaning up.
7.	**Handling and storage**	• Precautions for safe handling. • Conditions for safe storage, including any incompatibilities.
8.	**Exposure controls/personal protection**.	• Control parameters, e.g., occupational exposure limit values or biological limit values. • Appropriate engineering controls. • Individual protection measures, such as personal protective equipment.
9.	**Physical and chemical properties**	• Appearance (physical state, color, etc.). • Odor. • Odor threshold. • pH. • melting point/freezing point. • initial boiling point and boiling range. • flash point. • evaporation rate. • flammability (solid, gas). • upper/lower flammability or explosive limits. • vapor pressure. • vapor density. • relative density. • solubility(ies). • partition coefficient: n-octanol/water. • autoignition temperature. • decomposition temperature.
10.	**Stability and reactivity**	• Chemical stability. • Possibility of hazardous reactions. • Conditions to avoid (e.g., static discharge, shock or vibration). • Incompatible materials. • Hazardous decomposition products.

11.	**Toxicological information**	Concise but complete and comprehensible description of the various toxicological (health) effects and the available data used to identify those effects, including: • information on the likely routes of exposure (inhalation, ingestion, skin and eye contact); • Symptoms related to the physical, chemical and toxicological characteristics; • Delayed and immediate effects and also chronic effects from short- and long-term exposure; • Numerical measures of toxicity (such as acute toxicity estimates).
12.	**Ecological information**	• Ecotoxicity (aquatic and terrestrial, where available). • Persistence and degradability. • Bioaccumulative potential. • Mobility in soil. • Other adverse effects.
13.	**Disposal considerations**	• Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.
14.	**Transport information**	• UN Number. • UN Proper shipping name. • Transport Hazard class(es). • Packing group, if applicable. • Marine pollutant (Yes/No). • Special precautions which a user needs to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises.
15.	**Regulatory information**	• Safety, health and environmental regulations specific for the product in question.
16.	**Other information including information on preparation and revision of the SDS**	

iii. Electronic copies of SDS are maintained within the QMS in a folder named “Safety” by the Safety Committee.
iv. Employees receiving new SDS must forward a copy to a member of the Safety committee or the Safety Officer so the document can be uploaded into the QMS.

v. It is suggested that each Unit maintain a copy of SDS specific for chemicals used within the work area if there is no access to the QMS in the area.
    1. Areas that maintain paper SDS copies are responsible to maintain updated SDS.

i. Incompatible Chemicals:
    i. The hazard of accidental mixing of non-compatible chemicals or chemicals which may generate a hazardous by-product is basic to any chemical laboratory. Substances in the left hand column below are examples of those that are stored and handled so they cannot accidentally contact corresponding substances in the right hand column under uncontrolled conditions, as violent reactions may occur. If there is a question as to the proper storage of a chemical, the SDS should be consulted.

These examples are not all inclusive.

Chemical:	**Caution with:**
Acetic acid	Chromic acid, nitric acid, hydroxyl-containing compounds, ethylene glycol, perchloric acid, peroxides, and permanganates
Acetone	Concentrated nitric, sulfuric and chromic acid mixtures
Ammonia	Mercury, chlorine, calcium hypochlorite, iodine, bromine, hydrogen fluoride, bleach (sodium hypochlorite) and hydrochloric acid
Chromic acid	Acetic acid, turpentine, alcohol, other flammable liquids, nitric acid, silver salts, photographic chemicals
Hydrocarbons (benzene, butane, propane, gasoline, turpentine, etc.)	Fluorine, chlorine, bromine, chromic acid and peroxide
Nitric acid (conc.)	Acetic acid, acetone, alcohol, aniline, chromic acid, flammable liquids, flammable gases, and nitratable substances such as glycols
Strong Oxidizers (H2SO4)	Chlorates, perchlorates, permanganates

j. Hazardous Waste Disposal
    i. The following references are rules for hazardous waste disposal supplied by the Connecticut Department of Energy and Environmental Protection.
        1. Conditionally Exempt Small Quantity Generator Handbook for Hazardous Waste Handlers, March 2009
        2. A Road Map to RCRA Small Quantity Generators (SQG) Requirements/Guidance Manual, September 2009

ii. "Satellite" waste accumulation areas are monitored weekly. A Satellite Waste Storage sheet is maintained at each site. This is completed by a Safety Committee member or an individual designated by the Deputy Director.
    1. The Satellite Waste storage sheets are maintained within the unit for the calendar year and forwarded to the Safety Officer at the end of the year.

iii. Container Specifics:
    1. Must be free of cracks, rust, holes and dents
    2. Must be compatible with the materials being stored
    3. Must be closed unless physically adding or removing waste

iv. Marking and Labeling Requirements:
    1. Must be marked with "Hazardous Waste" and other words to describe the waste, such as the chemical name and warning statement
    2. Generator's name and address
    3. Date the container is full and transferred to the main waste storage location.

v. Hazardous Waste Storage Area is where the majority of wastes are stored on-site prior to disposal.
    1. Containers must be stored on a sufficiently impervious surface.
    2. Containers must have secondary containment of either 10% of the total volume of waste in the area or the volume of the largest storage container in the area, whichever value is greater.
    3. Containers of incompatible waste must be segregated in a fashion that would prevent mixing of waste in the event of a container release or spill.
    4. The hazardous waste storage area is inspected weekly.
    5. Hazardous waste in this storage area should be disposed of through a Hazardous Waste Disposal Company approximately every 6 months.

vi. Satellite Accumulation Area (point of generation – POG) is to provide for the day-to-day management of hazardous waste.
    1. Each container must be located in an area at or near the point of generation.
    2. Each container must be under the control of the operator of the process generating the waste.
    3. Once the container is full, the accumulation start date must be written on the label and the container needs to be moved to the Hazardous Waste Storage area within 72 hours of this date.
    4. When transporting chemical waste to the basement hazardous waste storage location the elevator should be used, and the items should be on a cart or in a secondary containment container.

k. <u>Spill Control:</u>

i. Spills must be anticipated and planned for since the laboratory environment necessarily involves the handling of hazardous substances. In some cases, the material, if spilled and improperly handled, can represent a significant threat to the health and safety of Division staff. Caution should be taken in cleanup procedures.

For any type of chemical spill, gloves, puncture resistant gloves, particulate air masks, aprons or laboratory coats are available for use as needed.

ii. Degree of Hazard, The degree of hazard involved in any particular spill will be directly related to:
    1. The product's identity (e.g. sucrose vs. benzene)
    2. The quantity involved (e.g. 50 ml vs. 500 ml vs. 5 L)
    3. The physical form of the product (e.g. dry powder vs. liquid)
    4. Where the spill has occurred (e.g. near an ignition source vs. in the hall vs. under a fume hood)

iii. It will be up to the employee to use good judgment in assessing the spill. Employees also share the responsibility for co-worker's health and safety. Remember the spill of a few milligrams of a drug which absorbs through the skin can be as significant as the spill of a 4L bottle of methylene chloride.

iv. Preparing for a Spill:
    1. Know the location and identify all the chemicals in the work area.
    2. Know the location of the spill kits in the work area.
    3. Determine from information provided in the SDS which chemicals are hazardous and present health and safety threats.
    4. Minimize the chance for a major incident by working with the smallest quantities possible. Be particularly careful when transporting chemicals between storage areas and work areas.
    5. Chemicals stored in the ground level storage room should always be transported with the use of the elevator and a cart when possible. Do not carry the bottles up/down the stairs.
    6. Always work with dry hands.
    7. When flammables are involved, identify sources of potential ignition in the work area.
    8. Aside from fire danger, consider the health hazards associated with inhalation or skin contact.
    9. Locate and identify the correct spill clean-up materials and the proper personal protective equipment. (Remember, in a spill situation, established permissible exposure limits could be exceeded, sufficient respiratory protection should be worn. Isolation of the spill, evacuation of the area and allowing experts to clean the site may be the best option.)

v. Spill Kits:
    1. Spill kits are available to clean up specific chemicals in the laboratory work areas. It is the employee's responsibility to know the location of emergency equipment in their assigned areas. Always be aware of what chemicals are used and the specific spill kits available in the laboratory.
    2. Commercially available Spill Kits include:
        a. Acid Kits
        b. Caustic Kits

c. Solvent Kits
d. Mercury Kits
e. Biological Kits (blood/urine/emesis)
f. Spill Control Pillows
    i. All spill kits come with instructions that must be followed. Anyone that does not feel comfortable cleaning a spill, should call the Unit Supervisor or Lead.

3. Responding to a Routine Spill:
    a. Evaluate the spill; a routine spill is a spill situation in which there is no immediate threat to life.
    b. Immediately inform someone else in the area about the spill.
    c. Take steps to prevent the spill from spreading, if it is safe to do so.
    d. Proceed with the cleanup, making use of the SDS information and using properly selected spill cleanup materials and personal protective equipment. If help is needed cleaning up the spill, call for a Supervisor, Lead or co-worker to assist. If time permits, get notification of the incident to the Unit Manager or FSE3..
    e. Report any major spills to the Safety Officer, once it is safe to do so.
4. Responding to an Emergency Spill:
    a. An emergency spill is a spill situation in which there is an immediate threat to life.
    b. If the spill involves a flammable solvent in significant quantity to pose a threat of fire, pull the nearest fire alarm box and direct evacuees away from the spill area.
    c. If a spill of a hazardous chemical occurs and any potential health or safety threat cannot be neutralized, immediately:
        i. Call the Unit Supervisor, Lead or Manager for assistance. The Director or Safety Officer may also be contacted for guidance. Advise them that an emergency spill has occurred and identify the substance and the spill area.
        ii. If possible, extract any injured people from the area.
        iii. Evacuate the spill area or building or keep others away from the spill area until help arrives, as the situation warrants.
        iv. If possible retrieve the SDS to aid in the control and cleanup of the spill.
        v. Above all else, remain calm, and use good judgment don't hesitate to be cautious for the protection of self and others
        vi. Report the incident to the Safety Officer so that proper procedures can be followed. (This can wait until after the situation is under control.)
    d. When a chemical spill occurs:

i. If unsure as to the proper clean up or disposal procedures contact the Unit Supervisor or Lead.
ii. Always wear personal protective equipment when dealing with a spill (laboratory coats, gloves and protective eyewear).
iii. There are several products available for chemical spill clean ups. It is important that the manufacturer's guidelines are followed for these products. Contact the Unit Supervisor or Lead if help is required for the use of the spill kits..

e. Fentanyl and other opiate Spills (minor amounts):
i. Wear PPE including gloves, disposable lab coat, eye protection and mask.
ii. Use soap and water to clean surfaces.
iii. Clean with 10% bleach
iv. All materials used to clean the spill are to be thrown out in a biohazard container.

f. Fentanyl and other opiate Spills (large amount):
i. Everyone should leave the area and contact the Section Manager. If needed, post someone just outside the area to make sure no one enters unexpectedly.
ii. The Manager will assess to determine if the spill is limited in nature and okay to clean or if an outside service is required.
iii. If the spill is to be cleaned internally, use Dahlgren Decon in combination with FiberTect wipes per the manufacturer's directions when available.

l. Chemical Exposures:
i. If exposure occurs, individuals may react differently. Acute symptoms require emergency medical care. Chronic symptoms may not be obvious immediately, but may linger for hours, and possibly days.
ii. In the event of chemical contact, flush the area with tepid or cold water. The recommended time is fifteen minutes.
1. Note if wearing contact lenes these should be removed prior to flushing the eye to allow the water to better contact the eye.

iii. Receive immediate medical care when appropriate.
iv. Abnormal exposures should be reported to the Unit Manager. This will be documented and reported according to established departmental employee injury guidelines.
v. In the event of exposure to expected fentanyl or fentanyl analogues obtain assistance immediately.

1. Naloxone (Narcan) is located in several areas of the DSS including the breakroom, Forensic Biology, Evidence Receiving, Latent Prints, Computer Crimes, Toxicology and the Controlled Substance Unit.
2. If exposure is to the skin flush the skin and use soapy water to clean the skin. Do not use alcohol based products such as hand sanitizer.
   Note that per CDC/NIOSH guidance soapy water is suggested method to clean fentanyl from skin.

F. INSTRUMENTAL AND MECHANICAL HAZARDS:

a. General Guidance: Essential to the operation of any laboratory device in the Division are the following fundamental guidelines:
   i. Operational and safety lessons will be provided to employees as part of training within the unit regarding the use of DSS laboratory provided equipment. The manufacturer, the Supervisor or Lead, or another previously trained examiner will provide these lessons.
   ii. Personnel will be allowed to use equipment after it has been determined by the appropriate Supervisor or Lead that the employee is familiar with the equipment, its operation, safety features, and inherent hazards.
   iii. No alteration of manufacturer's safety features is allowed.
   iv. Periodic safety inspections are performed to identify any hazard(s) that might develop. E.g. worn cords, broken cords, broken groundings or other device specific checks.
   v. All electrical units must be grounded or double insulated.
   vi. Qualified personnel must perform all maintenance.

b. Compressed gas cylinders: Only those trained will transport and connect compressed gas tanks.
   i. Compressed gas cylinders must be securely anchored to prevent accidental tipping/falling. The restraint should be positioned approximately 2/3 the height of the tank.
   ii. Gas cylinders not in use shall remain in the garage storage location until put in use or returned to the vendor.
   iii. Gas cylinders, full or empty, will be transported only with a cart designed for gas cylinder transport.
   iv. Valve covers must remain in place unless in use.
   v. When in use gas cylinders, lines, valves, and regulators should be routinely inspected for leaks, unsafe mounting or other hazardous conditions. The CGA code (Compressed Gas Association) code of the regulator needs to match the CGA code on the gas cylinder valve.
   vi. Proper PPE will be worn when transporting or hooking up gas cylinders. This includes eye protection (goggles, face shield). If working with liquid nitrogen insulated gloves are required.

c. Specialized Equipment:

i. General considerations of ventilation, radiation shielding, training, and awareness of hazards are augmented by the following concerns:
    1. Electrical cables should be protected from flooding and mechanical damage to guard against shock hazard.
    2. For high vacuum systems not otherwise implosion-protected, shielding should be placed to guard against implosion.
    3. Water cooling systems are to be installed in compliance with manufacturer's recommendations and periodically inspected.

ii. Microscopy:
    1. Instruments should be periodically inspected to ensure that light levels or wavelengths are not used which could be damaging to vision.

iii. Lasers/Alternative Light Sources:
    1. As the type and intensity of lasers/alternate light sources may vary widely, as well as the environment in which it is being used, these following general guidelines shall be adhered to:
        a. Ensure proper installation to reduce shock hazard.
        b. Never look directly at the beam or allow specular (mirror-like) reflection.
        c. Never view the beam pattern directly.
        d. Wear goggles that provide protection for the wavelength of the laser/alternate light source used.
        e. Rubber matting is provided, when appropriate, when working with high voltage equipment and/or external power sources.
        f. The Latent Print Unit utilizes a class 4 laser as an alternative light source. This device is used in a controlled area. When in use a warning light is on within the Latent Print laboratory. When this light is on no one is to enter the controlled area. The controlled area is labeled with a warning sign of “Danger Laser in Use”.
        g. Note: Latent Print unit employees must follow the guidance of SOP LP-28 Laser Safety Program and LP-29 Latent Print Unit Laser System when using the Unit’s Laser Light source.

iv. <u>Miscellaneous Equipment:</u>
    1. Floodlights, TV, cameras, monitors and other.
        a. Thermally insulated light bulb sockets are to be used where floodlights are employed.
        b. Ties or similar apparel shall not be worn around machines with moving parts.
        c. Steam irons, illuminators, optical comparators, video monitors.
            i. Those using these devices should review the device for fraying power lines, cords, or any other electrical hazards that would result in shorting or fire situations. Any issues noted

must be reported immediately to the Section Supervisor to be addressed.

d. Serial number restoration equipment.
    i. Equipment should be used only when properly grounded and equipped with a current-limiting device, such as a fuse or series resistor to prevent accidental shorts from overheating the power supply.
    ii. Serial number restorations should be conducted only where ventilation exists, such as under a fume hood.

v. Mechanical Hazards of Firearm Handling:
1. General Safety Procedures:
    a. All firearms being submitted to the DSS shall be rendered safe by a Firearms Examiner prior to transporting the weapon from the Evidence Receiving Unit.
    b. Always assume a weapon is loaded and handle accordingly.
    c. No firearms should be loaded in the facility except in defined test-firing areas, when in the care and custody of a member of the Firearms Unit. (Exceptions are made for the firearms of sworn personnel).
    d. No firearm will be pointed at or in the direction of another person.
    e. Any problems or doubts concerning the safety of a firearm should be brought to the attention of an experienced Firearms Examiner. If doubt exists as to the safety of direct firing, a remote-firing device should be employed.
    f. Face shields should be used in situations where bullet/gun fragments may be deflected towards the shooter.
    g. All personnel who conduct test-firings should be instructed in a course in the proper handling of firearms. Evidence of training shall be maintained in the analyst's training binder.
    h. Any problems or doubts concerning the safety of a firearm should be referred to the Unit Lead or Supervisor or the Unit Manager.

vi. Test Firing: Safety Tank and Range Area:
1. All test firing should be conducted in the proximity of another person whenever possible.
    a. No test firing shall take place when the examiner is alone in the building (e.g. after hours, weekends, etc.)
    b. Notice of firing will be given to others in the building during off hours.
2. Personnel in a test firing area shall wear safety glasses and dual layer hearing (ear) protection.
3. Non-authorized personnel or interns shall not discharge firearms within the Division's range and tank room.

4. Test firing for other than case and/or Division related purposes will not be conducted. No recreational shooting shall take place in the Division's range.
5. The tank room and firing range are constructed with bullet proof walls, glass and doors.
6. Weapons from the reference library shall not leave the Division of Scientific Services facility without prior written permission of the Director.
7. A solid amber warning light is activated when the test fire tank or firing range are in use. These lights are located in the halls around the firing areas.
8. The firing tank is equipped with an alarm (doorbell sound) that will sound if someone in the area needs assistance. Anyone noting the alarm should obtain help and assist as needed.
9. When test firing weapons during normal business hours, the doors to the range and tank room shall remain closed and secure.
10. Keys and proximity card permissions allowing access to the range and tank test firing areas are limited to personnel assigned to the Firearms Unit, the Section Deputy Director and other personnel as deemed necessary by the Director.
11. Check the bore of the firearm for obstruction prior to loading.
12. All test firearms should only be loaded in the test firing areas. The muzzle of all firearms must be pointed down range or towards the water in the tank (downward within the tank) when being made ready for test firing.
13. Lead Vapor/Particle Contamination:
    a. During indoor test firings, the air exhaust system must be on to remove the discharge residue from the shooter's face. Ventilation should be adequate to reduce exposure to permissible levels.
    b. Those in the Firearms Unit will refer to FA SOP-2A Firearms Safety –Lead Conformance.

G. FIRE SAFETY:

a. The Division of Scientific Services is equipped with a fire alarm system which includes hard wired smoke detectors, a sprinkler system and direct notification to the local fire department, the contracted alarm company and DESPP communications when the fire alarm or panic button is triggered.
b. Illuminated Emergency Exit signs are located by all external exit locations. Fire alarm units are both visual and auditory, having a strobe light and horn.
c. Sprinklers will not be blocked. The minimum vertical clearance between a sprinkler head and the items below it is 18 inches.
d. <u>Firefighting equipment</u> available throughout the Division includes:
    I. Fire extinguishers
    II. Fire blankets
e. <u>Evacuation Plan</u>:
    I. Fire Alarm:

1. When a fire alarm is sounded, all employees are required to evacuate the building and assemble at designated meeting locations around the flagpole across from the parking lot (see diagram below). This should be done as quickly as it can safely be done.
2. Elevators are not to be used during a fire alarm.
3. Employees should be familiar with primary and secondary escape routes for the areas they frequently work in. Maps are posted throughout the facility that demonstrate the quickest route available to evacuate the building from the location.
4. Individuals that require assistance in evacuating the building should go to the "Area of Refuge" located in the Emergency stairwell of phase III. There is an emergency contact button that must be pushed to receive assistance. Pressing this button alerts DESPP Communications, which is manned 24 hours a day. A direct communications link is then made to the alarm panel area located in the Phase II classroom lobby where the fire alarm panels reside. This allows for voice communications from the area of refuge to emergency responders.
5. The Safety Officer (or designee) will obtain the emergency check list which is maintained on a clipboard in the administrative area and carry this to the reporting area.
    A. In the event the Safety Officer is not present during an evacuation another manager will be responsible to obtain the employee "Emergency Check List".
6. The "Emergency Check List" contains a list of Managers, Unit Supervisors and Leads. It is the Quality Section's responsibility to ensure that this list is kept up to date as personnel changes occur. This also contains a copy of the current table of organization or list of personnel.
7. There are designated meeting areas per Section around the flagpole (see below). Employees are required to go to the designated meeting area for their Section and to check in with their next in command that is on site.
    A. Employees will await further instructions from the Director or designee.
    B. In the case that the pre-set meeting location is not appropriate, the Safety Officers and Managers will direct employees to a more appropriate meeting location.
8. Employees that pulled an alarm must report directly to the "Reporting" area to inform the Director (or designee) why the alarm was pulled.
9. Per Section, the highest in command (DD, AD, SSAM, LISM, FSE 3) that is on site will check in with the Safety Officer or designee. The Safety Officer will be in front of the flagpole in the designated "Reporting" area.
    A. Once Managers account for their staff, they will stay in the Reporting Area and wait for further instructions.

B. The Building Manager (RM Bradley representative) will report to the "Reporting" area to provide any needed information and await further instructions.
C. The Safety Officer will report to the Director that the building is cleared or that there are unaccounted for personnel.

10. The Director (or designee) will be the liaison with the 1st responders.

f. Other Emergencies:
   i. 911 Should be called in an emergency event. Refer to GL-3 for guidance.

g. Flammable chemical storage:
   I. Must comply with local fire codes.
   II. In rooms with only one (1) exit, flammables must be stored away from the exit.
   III. Flammable storage locations must be minimized. A single storage area has been established for large quantities of flammable materials. The chemical storage room is located in the basement of the building and has a separate air exhaust exchange system.
   IV. The chemical storage room contains solvent cabinets designated for storage of usable solvents and for solvent waste. Additionally, there are cabinets specifically for acid storage and "other" chemical waste storage.
   V. Items not associated with chemical storage or waste should not be stored in this area.

h. Building Specific Safety Issues:

I. Lighting Levels:

1. All lighting fixtures meet electrical codes.
2. All ultraviolet lights (under 350 nanometers) should have a label reading "WARNING - Avoid Excessive Exposure to Eyes and Skin".
3. Fluorescent and incandescent bulbs are protected by plastic shields unless such shielding would result in a hazard.
4. Battery-operated emergency lights are present to provide safe exit from each facility in the event of power shutdown.
5. The DSS facility has a back-up generator which will begin emergency operation of electrical and life safety systems within 15 seconds of a power failure. Note not all areas are connected to the generator.

II. Ventilation:

1. Fume hoods should be compatible with the materials used in them.
2. Fume hoods must exhaust hazards in such a way as to eliminate the possibility of reentry into the work area or exposure of individuals near the exhaust.
3. Where applicable, the fume hood breaker must be labeled "WARNING - Do Not Shut off without Notifying Laboratory Personnel".
4. Standalone hoods are available in many areas. These may be powder safe hoods, charcoal filter hoods or other. These are manually operated by the individual laboratories as needed for casework.
5. Air conditioning must meet re-circulation requirements when designed and installed. Filters should be changed according to manufacturer's guidelines.

III. Electrical:

1. All electrical wiring and equipment must meet current National Electrical Code Standards. Designers and installers should be notified of this requirement.
2. Shock hazards will be handled as follows:
   A. Ground fault interrupters are required per National Electrical Code Standards and State Building Codes.
3. Rubber matting is provided when working with high voltage equipment and/or external power supplies.
4. Emergency shutdown procedures should be immediately available for every outlet, instrument, and electrical device which is potentially hazardous.
5. Emergency shutdown procedures will be posted at the point of need.
6. Explosion-proof motors should be used in all areas where any concentration of flammables may exceed dangerous levels.

i. Division Vehicles:

I. Vehicles assigned to the Division are available for use by DSS personnel for court, crime scenes and other authorized functions. Management oversees and records the

upkeep of the vehicles. Employees using state vehicles are responsible to report any problems with the vehicle, upon return of the vehicles, to the Scientific Services Administrative Manager or their designee.

II. The following items are inspected on a routine basis:
    1. Steering
    2. Fluid levels
    3. Brakes
    4. Lighting systems (headlamps, brake lights, turn indicator lamps)
    5. Tire pressure and condition of tread. Both the wear and the suitability for road conditions are evaluated.
    6. Spare tire, jack, lug wrench.

H. INSPECTION AND COMPLIANCE:

a. The Director or designee is responsible for safety within the Division.
b. The Director has appointed a Safety Officer.
c. The Division shall have a safety committee that will be comprise of the Safety Officer and members of various sections within the Division.
    I. Chemical Analysis Section
    II. Forensic Biology/DNA
    III. Identification Section
    IV. Laboratory Support Services
d. The Safety Officer will meet with the safety committee on a quarterly basis to discuss any non-emergency issues/concerns that have arisen since the previous meeting relating to general laboratory safety.
e. Emergency meetings may occur as required by circumstance.
f. Minutes of these meetings will be kept on file with the Safety Officer.
g. The Safety Officer will schedule annual safety audits. The safety committee will be assigned to assist with auditing the various areas of the DSS. Form GL 2.6 will be used to capture the various safety topics reviewed. Upon completion of the audit, a summary will be written of and provided to the Director. A copy of the audit documentation will be maintained within the QMS.
h. The Director will ensure compliance with annual audits.
i. It is the responsibility of all members of the Division to report any hazards and/or violation of this safety manual to the Safety Officer.
j. Any hazardous situation deemed uncorrectable should be temporarily prohibited by the Safety Officer. An evaluation of this hazard will be conducted by the Safety Officer and Director (or designee) for further corrective action or permanent abatement.
k. The Safety Committee members are responsible for periodic maintenance checks (as appropriate). Maintenance checks are documented by use of safety checklists:
    I. First aid kits, annually. Conducted by members of the Safety Committee.
    II. Personal safety devices:

1. AED, monthly. Conducted by a member of the Safety Committee

III. Inspection of Hazardous Waste Storage Area, conducted by personnel within the unit generating the waste – performed weekly.
IV. Proper handling, storage, and disposal of biological contaminated items. Monitored by a member of the Safety Committee.
V. Proper use, storage and disposal of chemicals and hazardous waste. Monitored by a member of the Safety Committee.
VI. Fume hoods, annually. Scheduled by the Safety Officer or designee, conducted by a contracted vendor.
VII. Vehicles and related equipment. The Scientific Services Administrative Manager (or designee) arranges for appropriate vehicle maintenance and maintains vehicle records. Any problems noted during use of a state vehicle will be reported to the Scientific Services Administrative Manager or their designee.

l. The Building Facility Manager performs checks of building emergency systems, that are recorded on a 'Building Maintenance Log' spreadsheet and the Safety Officer will maintain copies of the spreadsheets. The spreadsheet minimally includes dates of the following checks appropriate:
   I. Fire extinguishers will be visually inspected monthly by a member of the contracted building maintenance company to verify that they have not been discharged (seal is in place). All extinguishers are visibly marked as such and re-certified annually.
   II. Emergency Fire system:
      1. Fire Panel – twice per year (by state contracted vendor overseen by building maintenance firm)
      2. Fire Extinguisher Test – annually (by state contracted vendor, overseen by building management firm)
      3. Emergency /Exit Light Check – monthly (by building management firm)
      4. Fire Sprinkler Test – Quarterly (by state contracted vendor, overseen by building management firm)
   III. Emergency shower, annually. Conducted by state contracted building maintenance company.
   IV. Emergency eyewash flushed monthly. Conducted by state contracted building maintenance company.

Personnel should notify their Section Manager, the Safety Officer or designee of any problems concerning the above-mentioned items as soon as they are observed.

I. MEDICAL SURVEILLANCE:

a. Health Monitoring
   I. Hepatitis B: Vaccinations are available to all employees. Once vaccinations are given, employees will have titers taken to demonstrate effectiveness. Employees

requiring vaccinations will contact the Safety Officer to determine the proper mechanism for this to occur.

II. New employees refusing a Hepatitis B vaccine or those that have previously received a vaccine must sign a refusal waiver.

III. It is recommended that employees working in the Firearms unit be tested annually for blood lead and/or zinc protoporphyrin levels; as determined by their physician. This should be arranged through the employee's individual physicians.

J. TRAINING:

a. New employees will be introduced to general topics of safety in the Division. This will usually occur on an employee's first day. The Safety Officer (or designee) will walk the employee through the facility, explain the evacuation plan, introduce the safety manual and explain general Division safety policies. (See checklist GL-2.2)

b. Safety training sessions will be made available to Division staff on a periodic basis specified by the Safety Officer. In general, an electronic based (through the QMS) Blood Borne Refresher training, Chemical Hazard and Building Safety (Fire/Evacuations) training will be given annually.

c. Records of each lesson conducted will be maintained within the QMS. If training occurs that is not through the QMS, records will be maintained including date, subject matter, and the name of the instructor and each student.

d. Training in specific laboratory techniques and potential chemical/biological exposures will include training relevant to hazards that are inherent to the analysts' assigned unit, including any necessary precautions. This training will be recorded, as specified, within each unit's training SOP.

I. Those performing work in the Firearms Unit and Chemical Analysis Section will be trained in the OSHA standard 1910.1025, the potential of exposure to lead and methods to minimize exposure. This training will occur annually and be documented through the QMS.

II. Those working in the Latent Print area will have annual training in the operation of the Laser light source; this will be assigned and documented through the QMS.

e. Unit training will ensure analysts are trained in the following, based on the work performed in the Unit.

I. Safe handling of chemical and biological samples.

II. Cleanup of chemical spills and biological hazards.

III. Proper use of fume hoods with attention to sash height, chemical storage, and use with aerosol applications.

IV. Locations and use of eyewash and shower stations.

V. Proper use of all PPE as pertaining to specific tasks.

VI. Safety issues specific to a particular technique will be included in the training for that procedure.

VII. The role of the Safety Officer - Employees must be familiar with the duties of the safety officer, the safety committee, and means of reporting hazardous conditions.

K. REFERENCES:

Note the following references can be found in the QMS in the Safety Folder.

a. OSHA 1910.1030 Bloodborne Pathogens
b. OSHA 1910.1200 Hazard Communication
c. OSHA 1910.1450 Occupational Exposure to Chemicals in Laboratories
d. Globally Harmonized System of Classification and Labeling of Chemicals (GHS)
e. OSHA 1910.1025 Toxic and Hazardous Substance: Lead
f. OSHA 1910.1025 Appendix A Substance Data sheet for Lead Exposure
g. OSHA 1910.1025 Appendix B Employee Standard Summary
h. CT DEEP Conditionally Exempt Small Quantity Generator Handbook
i. CT DEEP A Road Map to RCRA: Small Quantity Generators Requirements
j. CDC/NIOSH: Guidance on Fentanyl
k. Powerheart G5 - Automated External Defibrillator user manual
l. Spill Kit inserts
m. Dahlgren Decon Instructions
n. Prudent Practices in the Laboratory: Handling and Management of Chemical Hazard
o. Other references as appropriate