

## Chapter 13

### PROGRAMS

#### 13.1 PURPOSE

This chapter provides written safety plans and programs for Confined Space Entry, Respiratory Protection, Hearing Conservation, Motor Vehicle/Heavy Equipment Authorization, Lock-Out/Tag-Out, Bloodborne Pathogens Exposure Control, Laboratory Safety/Chemical Hygiene, Hazard Communication and Indoor Air Quality.

#### 13.2 CONFINED SPACE ENTRY

This section provides the information necessary for identifying confined spaces at Department owned or leased properties and the measures to be taken to ensure safe entry of employees in such confined spaces.

##### 13.2.1 Definitions

- (A) **Confined Space** - An enclosed space that:
- (1) Is large enough for an employee to bodily enter,
  - (2) Has limited or restricted means of entry or exit (for example, tanks, vaults, wells, tunnels, and pits), and
  - (3) Is not designed for continuous employee occupancy.
- (B) **Permit-Required Confined Space (PRCS)** - A confined space that has one or more of the following characteristics:
- (1) Contains or has the potential to contain a hazardous atmosphere.
  - (2) Contains a material that has the potential for engulfing an entrant.
  - (3) Has an inside configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross-section.
  - (4) Contains any other recognized safety or health hazards.
- (C) **Entry** - The action by which a person passes through an opening into a permit-required confined space.

- (D) **Entry Permit** - The written or printed document that is provided to allow and control entry into a permit space.
- (E) **Engulfment** - The surrounding and/or capturing of an entrant by divided particulate matter or liquid.
- (F) **Hazardous Atmosphere** - An atmosphere that may expose employees to risk of death or incapacitation, injury, or illness by reason of oxygen deficiency less than 19.5% oxygen for enrichment (greater than 23% oxygen) flammability or explosivity, or toxicity.
- (G) **Non-Permit Confined Space (NPCS)** - A space which by configuration meets the definition of a confined space but which after evaluation is found not to contain, or with respect to atmospheric hazards, does not have the potential to contain any hazard capable of causing death or serious physical harm.

### 13.2.2 General Requirements

#### (A) Confined Space Identification/Classification

- (1) Unit Managers/Cost Center Managers or designees shall ensure that the following are conducted:
  - (a) Confined space awareness training for employees; to include hazard recognition, air quality, general confined space risk factors and controls (depth of confined space, age of confined space, and the season), and emergency extraction procedures
  - (b) An evaluation of potential hazards within confined spaces including but not limited to manholes, box culverts, catch basins, storm sewers, storm water inlets, weigh station pits, SSI storage tanks, bascule bridge machinery rooms, lift station tanks, sanitary sewer systems, excavations, and steel reinforced concrete and prestressed concrete box girders to identify; and
  - (c) Based on the evaluation of hazards, classify the confined spaces as either (PRCS) or (NPCS). Since posting or installing signs on confined spaces located on or off roadways is not realistic, a single form can be developed by the District Safety Officer or designee identifying the types of confined spaces in the District and then what each space is classified as. This form

can then be distributed to other units in the District that may be involved in entering existing or new confined spaces.

**(B) Re-Evaluation of Hazards**

Re-evaluation of the hazards based on possible changes in activities in the identified confined space or other physical or environmental conditions which could adversely affect the space must also be conducted.

**13.2.3 Entry in Confined Spaces**

- (A)** Except under certain conditions, **no** Department employee will be allowed to enter a PRCS.
- (B)** No Department employee will be allowed to walk or crawl through existing underground storm water pipes for the purpose of inspecting, repairing or replacing damaged pipe. Where repair or replacement of underground pipes is required, access to the pipe must be done by trenching/excavating or contracting out the job. The use of optic cameras can also be used to determine the extent and location of any pipe damage.
- (C)** If the Unit Manager/Cost Center Manager has determined that the only hazard in the identified confined space is atmospheric and ventilation alone can control the hazard, entry into the confined space may be authorized. In such a case, the requirements for alternative protection procedures under **29 CFR 1910.146(c)(5)** shall be followed and complied with.
- (D)** All entries into confined spaces must be documented to include the results of the air sampling and when the gas monitor was last calibrated.

**13.2.4 GAS MONITORS**

- (A)** Ensure these are calibrated per the manufactures recommended schedule and before an employee enters a confined space.
- (B)** Based on the manufacturer's instructions for testing, ensure the sensors are serviceable before entering a confined space. The sensors normally last about two years based on the manufacture.
- (C)** When purchasing or renting a gas monitor make sure it is supplied with a testing hose that extends down into the confined space so tests can be conducted at the entrance, halfway down and at the bottom.
- (D)** The monitor must be calibrated on the frequency defined by the manufacturer.

### **13.2.5 Contractors**

Unit Managers/Cost Center Manager shall ensure that when another employer, such as a contractor, performing work that involves entry into a confined space that has been identified as a PRCS, the employer shall be provided with sufficient information about the PRCS involved and the necessary requirements to comply with **29 CFR 1910.146**.

## **13.3 RESPIRATORY PROTECTION PROGRAM**

In the control of occupational exposure to harmful airborne contaminants, the primary objective is to prevent atmospheric contamination. This shall be accomplished, where feasible, by accepted engineering control measures such as enclosure or confinement of operations, general and local exhaust ventilation, and substitution of less toxic materials. Respirators are to be used only when engineering controls of respiratory hazards are not feasible, or when engineering controls are being installed, or in emergencies or as required per OSHA Silica Dust Standard [29 CFR 1916.1153(c)(1) table 1.

### **13.3.1 Responsibilities**

- (A)** Unit Managers/Cost Center Managers or designees are responsible for ensuring that respirator protection program is implemented when respirators are required and used.
- (B)** Employees are responsible for using respiratory protection in accordance with the training and instructions received.

### **13.3.2 Respirator Need and Selection**

The need for respiratory protection shall be determined through periodic inspections and testing by industrial hygienists or other qualified competent persons. The basis for respirator selection is dependent upon the airborne contaminant present; the physical, physiological, chemical, and toxicological properties of the contaminant; the applicable threshold limit value or permissible exposure level for the contaminant; the location of the hazardous area with respect to a safe area having respirable air; the period of time for which respiratory protection is to be provided; the activities of workers in the hazardous area; and the physical characteristics, functional capabilities, and limitations of respirators of various types.

### **13.3.3 Physical Examination**

Employees requiring the use of respirators as part of their job duties shall not be allowed to use respirators unless it has been determined by a

physician that they are physically able to perform the tasks while using a respirator. A physician will also review the employee's medical status annually. Any paperwork provided by the physician regarding the testing or medical evaluation, other than a statement they passed or failed the hearing test, is medical and must be maintained in the employee's personnel file.

Occasional Use: Workers may wear respirators to avoid exposures to hazards even if the exposure level does not exceed the limits set by OSHA standards. If you use a respirator voluntarily that is provided by your employer you must: read and comply with all manufacturer's instructions and warnings; use only approved respirators and cartridges designed for the specific hazard; and comply with **Section 13.3.4 (B)**, of this **Manual**.

#### 13.3.4 Respirator Training/Instructions

- (A) Respirator users will be instructed and trained in the proper use of how a respirator should be worn, how to adjust it, how to determine if it fits properly, proper storage and how to clean the respirator. The respirator user should have an opportunity to handle the respirator, have it fitted properly, test its face piece-to-face seal, wear it in normal air for familiarity period, and finally to wear it in a test atmosphere.
- (B) Respirators shall not be worn when conditions prevent a good face seal. Such conditions may be growth of beard, sideburns, recent dental work, or the presence of a temple piece on glasses. Each time an employee wears a respirator, a positive and negative seal test must be performed.
- (C) All training will be documented and entered in the Learning Curve System.

#### 13.3.5 Respirators Cleaning, Inspection, and Storage

- (A) **Cleaning** - Respirators shall be cleaned and disinfected before and after each use.
- (B) **Inspection** - Respirators shall be inspected before and after each use. The inspections shall include a check of the tightness of connections and the condition of the face piece, headband, valves, connecting tubes, and canisters. Rubber or elastic parts shall be checked for pliability and signs of deterioration.
- (C) **Storage** - After inspection, cleaning, and necessary repair, respirators shall be stored and protected from dust, sunlight, heat, excessive moisture, and contaminants. Routinely used respirators may be stored in plastic bags in such a way that the faceplate and exhalation valve will rest in a normal position. Respirators will not be stored in lockers or toolboxes unless they are in carrying cases or cartons.

- (D) Only qualified and experienced persons designated by the Unit Manager/Cost Center Manager shall be authorized to repair respirators.

### 13.3.6 Program Monitoring

To assure the adequacy of the respiratory protection program, monitoring shall be conducted by the supervisors and unit safety and health specialists or designated safety persons.

## 13.4 HEARING CONSERVATION PROGRAM

### 13.4.1 General Requirements

- (A) Unit Managers/Cost Center Manager shall ensure that an assessment is made of all work operations or processes that may expose employees to noise levels that equal or exceed an eight-hour TWA of 85 dBA.
- (B) A noise survey shall be conducted by adequately equipped and qualified personnel to evaluate the noise levels, following the criteria under **29 CFR 1910.95**.
- (C) When the evaluation of a work operation or process indicates that an employee's noise exposure **exceeds the allowable levels**, the following shall be instituted:

#### (1) Administrative/Engineering Controls

These controls must first be considered and used.

- (a) Administrative controls include reducing the employee's exposure time so they are not exposed to noise levels that exceed 85 dBA based on an 8-hour time weighted average (this means the various noise levels are measured during the employees' normal work shift and then the time weighted average would be the average decibel level of noise for the 8 hour day.)
- (b) Engineering controls include identifying ways of reducing the noise level through the use of noise suppression materials, retrofitting the equipment with mufflers or other equipment that will reduce the noise level or purchasing equipment designed to operate with a reduced noise level.

#### (2) Personal Protective Equipment

If these controls are not feasible or do not work, personal protective equipment must be provided:

- (a) Hearing protection must be available to all employees **(exposed at or above 85 dBA or 83.4 dBA for 10-hours)**.
- (b) Employees should be given the opportunity to select hearing protection with the assistance of a qualified and trained person, as to which size and type of protection is suitable for their work environment.

**(3) Audio Monitoring Program**

- (a) Audio monitoring should identify employees who need to be included in the program and ensure the proper selection of hearing protectors.
- (b) Audio monitoring shall be conducted by qualified personnel and must be repeated whenever a change in operation, process, equipment, or controls takes place and increases the noise level.
- (c) Each employee exposed at or above an 8-hour TWA of 85 dBA must be notified of the results of the monitoring.

**(4) Audiometric Testing Program**

- (a) Audio-metric testing shall be made available, at no cost, to any employee whose exposure equals or exceeds an 8-hour TWA of 85 dBA or 83.4 dBA for 10 hours.
- (b) Audio-metric testing shall be performed by a certified professional or qualified technician, and audiograms established in accordance with the requirements of **29 CFR 1910.95**.

**(5) POSTER**

A copy of the Hearing Conservation Standard is required to be displayed on each unit's safety bulletin board. This standard is available in the form of a poster from the OSHA website.

**(6) Training**

Training shall be conducted for all employees determined to be exposed to TWAs of 83.4 dBA and above, this training must be repeated annually and include:

- (a) The effects of noise on hearing.
- (b) The purpose of hearing protection and information on selection, fitting, use, and care.
- (c) The purpose and procedures for audiometric testing.

#### 13.4.2 Record Keeping

(A) Noise measurement records shall be maintained for two years and audiometric test records shall be maintained for the duration of the affected employee's employment. Audiometric test records are considered to be medical records and must be maintained in the employees personnel file.

(B) All training will be documented within the Learning Curve system.

### 13.5 MOTOR VEHICLE/HEAVY INDUSTRIAL EQUIPMENT OPERATION AUTHORIZATION

#### 13.5.1 Responsibilities

(A) Unit Managers/Cost Center Managers shall ensure that:

(1) Only qualified applicants are hired and employed as Department equipment operators (refer to ***Recruitment and Selection for Career Service Positions, Topic No. 250-015-005***).

(2) A list of currently authorized motor vehicle and equipment operators is prepared and maintained, and each supervisor is provided with a copy of the list.

(B) Supervisors shall immediately suspend driving privileges of employees who do not have a valid driver's license.

(C) Operators shall:

(1) Properly care for, inspect and safely operate all vehicles or equipment they are assigned to operate. Refer to Mobile Equipment Manual, Topic 400-000-001.



- (2) Report to their supervisor no later than the next workday following the suspension or revocation of their driver's license or commercial driver's license for the class and type of vehicle operated.

### **13.5.2 Training and Authorization of Operators**

#### **(A) The Unit Managers/Cost Center Manager or designee shall:**

- (1) Assign the responsibility, in writing, for verifying the competency of equipment operators and training to Department operators qualified by experience, training, and knowledge of equipment, or
- (2) Contract the training of operators with outside sources.
- (3) Ensure contract laborers, OPS, temporary workers, inmates who are authorized to use small motorized equipment (i.e., riding mowers, chain saws, lawn mowers, weed eaters, etc.) have received training from an experienced and authorized unit trainer who shall train the operator in safety and proper operations procedures. This training shall be documented using adopted forms. Inmates are to be trained by their DOC officer.

#### **(B) Current Operators**

- (1) Each Unit will develop a list of authorized equipment operators to include all operators' names, initials of supervisors, and all types of vehicles and equipment at the facility.
  - (a) Check off only those vehicle or equipment types the employee is authorized to operate.
  - (b) Provide a current copy of this list to all supervisors in the unit.
- (2) All operators currently authorized to drive specific equipment will have their authorization reconfirmed with the approval of the Unit Manager/Cost Center Manager or designee.

#### **(C) New Employees**

- (1) The supervisor shall prepare the vehicle operator authorization list:
  - (a) The supervisor shall either coordinate with the Department qualified operators to verify the competency of the employee, or, if contractors are being used, the supervisor shall coordinate the enrollment of the employee in the training program.

(b) The supervisor may authorize the employee to operate the equipment provided the new employee can show proof of training by his/her previous employer, demonstrate that he/she can operate the equipment satisfactorily, and knows the proper safety requirements for operation.

(2) The trainer (outside contractor or Department qualified operator) will train the employee on all operational characteristics and inspection of the equipment to include proper safety procedures. Training will consist of hands-on operation and instruction.

(3) Upon satisfactory completion of training, the supervisors or their designee will enter into the Learning Curve system.

**(D) Annual Evaluation/Remedial Training**

(1) Competency should be evaluated annually for all operators who operate the vehicle or equipment on a part-time or emergency basis and document the date this was accomplished. The immediate supervisor should maintain documentation of this competency evaluation either on a matrix that lists the vehicles and equipment each employee is authorized to operate or through some other means. and instead of inputting this in the Learning Curve system (since it is not training) identify on the form that a competency test was conducted and file the form in the employee's personnel file.

(2) If remedial training is required, after the employee successfully completes this training, the supervisor will document and have it entered into the Learning Curve system.

**(E) Vehicle Crash/Incident Review**

All vehicle crashes/incidents in which an employee authorized to operate Department equipment or vehicle was determined to have operated it in an unsafe manner, will be reviewed by the appropriate Unit Manager/Cost Center Manager or designee and District Safety Manager or Designee to determine if the employee should be allowed to continue to operate the equipment or vehicle.

**13.6 HAZARDOUS ENERGY CONTROL PROGRAM (LOCK-OUT/TAG OUT)**

This program has been established to prevent, an unintentional startup of machinery, equipment, or system, whenever the possibility exists. Or, when the unexpected release of stored energy could occur and cause injury to

employees. Machines or equipment must be isolated from their energy source(s) and rendered inoperative prior to servicing or maintenance. Energy sources include electrical, mechanical, hydraulic, chemical, thermal, and any other source of energy.

### **13.6.1 Responsibilities**

#### **(A) Unit Manager/Office Head**

Unit Managers/Cost Center Manager or designees are responsible for ensuring that:

- (1)** Employees authorized to repair, clean, or perform maintenance on any machine or equipment follow the lockout/tag out requirements of this program;
- (2)** Authorized employees are given instructions and are required to understand the type and magnitude of the energy source(s) that the machine or equipment utilizes and the methods and means necessary to isolate and control the energy source(s);
- (3)** Isolating devices, such as manually operated electrical circuit breakers, disconnect switches, or line valves controlling the energy source to the equipment or machines that will be locked-out or tagged-out are located and identified; and
- (4)** A list of all equipment requiring energy control is maintained.

#### **(B) Authorized Employees**

Before repairing, servicing, or performing maintenance on a machine or equipment, the authorized employee must:

- (1)** Notify all other employees, such as those operating and/or using the machine or equipment (affected employees) or those required to be in the area in which servicing or maintenance of the machine or equipment is being carried out, that a lock-out/tag out is going to be utilized and the reason for its use,
- (2)** Know the type and magnitude of the energy sources, the hazards of the energy to be controlled, and the means of control,
- (3)** Shut down the machine or equipment by using recommended stopping procedures and sequence, such as pressing the stop button, moving the switch to "**off**" position, or opening the toggle switch;

- (4) Isolate the main power source, switch(s), valve(s) or other sources of energy by moving them to the **"off"** position to render it inoperative;
- (5) Place a lockout/tag out device(s) on switch(s) or other energy sources physically restraining them in an **"off"** or safe position,
- (6) Make sure that stored or residual energy such as springs, hydraulic systems, compressed air, gas, steam, water pressure, and fuel sources are relieved or restrained by methods such as isolating, repositioning, bleeding down, or blocking,
- (7) After making sure no employees are exposed to a hazard, attempt a restart of the system to verify or test that the machine or equipment will not operate; and
- (8) Make sure the operating control(s) are returned to **neutral** or **"off"** position after the test. The necessary repairs, servicing, or maintenance may then be performed.

**(C) Other Employees**

All other employees, upon observing that there is a lock out or tag-out device in place on an energy-isolating device, must not attempt to start, energize, or use the machines or equipment being serviced or maintained.

**13.6.2 More Than One Authorized Employee**

- (A) If more than one employee is authorized to lockout or tag-out equipment, each shall place his/her own issued lock, or filled out tag-out device, on the energy-isolating device(s). In cases where the physical restraint of the energy isolating device by a connection capable of withstanding 50 pounds of removal forces (example: zip tie) and the durable in terms of the environmental to which they are exposed.
- (B) When an energy-isolating device cannot accept multiple locks or tags, a multiple lockout or tag-out device (HASP) may be used.
- (C) If lockout is used, a single lock may be used to lockout the machine or equipment with the key being placed in a lockout box or cabinet that allows the use of multiple locks to secure it. Each employee will then use his/her own lock to secure the box cabinet.
- (D) As each employee no longer needs to maintain his/her lockout protection, that employee will remove his/her lock from the box or cabinet authorized for group lockout or tag-out.

### 13.6.3 Restoring Machines or Equipment to Service

When servicing or maintenance is completed and the machine or equipment is ready for normal operation, the authorized employee shall:

- (1) Check the area around the machines or equipment to make sure that no employee is exposed to any restart hazards,
- (2) After removing all tools and reinstalling guards and other machine or equipment components, remove the lockout devices and reenergize the machine or equipment; and
- (3) Notify affected employees that the servicing or maintenance has been completed and the machine or equipment is ready for use.

### 13.6.4 Drawbridge Equipment Servicing, Repair, Maintenance, and Inspection

Servicing, repair, maintenance, and inspection is routinely performed on equipment or machines on drawbridges. Normally, the energy (power) source to any equipment or machine that must be maintained or repaired must be locked or tagged-out to prevent unexpected start-up of the equipment or machine and avoid injury to servicing employees. However, in drawbridge operation, it may not be possible to totally lockout the power source as a drawbridge is expected to render uninterrupted operation or service.

**13.6.4.1** To ensure the safety of the employee(s) performing maintenance work on drawbridges while the drawbridge remains in operation, the following must be observed:

- (A) **Authorized Employee** - When more than one (1) employee is involved in the maintenance work, only one employee will be designated and authorized to apply or remove the lock or tag-out device and communicate with designated bridge tender.
  - (1) The employee authorized to service, repair, or perform any maintenance on any drawbridge equipment or machine must:
    - (a) Be given instructions and understand the type and source of energy supplied to the machine or equipment,
    - (b) Identify the power source controlling the equipment or machine and place a lock or tag device on the power source and operating control in the “**off**” position. (The power source may be located or controlled in the bridge console.)

- (c) Inform the designated bridge tender of the reason for locking or tagging the operating control;
      - (d) Give specific instructions to the designated bridge tender that the lock or tag must not be removed, or the controls placed in the “on” or operating position without being expressly told to do so; and
      - (e) Ensure that radio and/or visual communication is always maintained with the designated bridge tender.
- (B) When informed by the designated bridge tender of a request for a bridge opening and the need to operate the drawbridge controls, the authorized employee must first ensure that it operation is made safe, for himself (or any other employee performing the maintenance work) and for the equipment or machine being maintained, before allowing the designated bridge tender to remove the “lock or tag” device and turn the power on. When there is more than one (1) bridge tender, only one will be designated to communicate with authorized maintenance employee. The designated bridge tender must:
  - (1) Maintain radio and/or visual communication with authorized employee at all times;
  - (2) Inform the authorized maintenance employee when there is a request for a bridge opening;
  - (3) Not remove the lock or tag device placed on the operating controls or place the control on the “on” or “operating” position without prior authorization from the employee performing maintenance work;
  - (4) When drawbridge operation is completed, place the operating controls on the “off” position and replace the lock or tag-out device on the operating controls; and
  - (5) Contact the authorized maintenance employee so work on the equipment or machine can be resumed.

## **13.7 BLOODBORNE PATHOGENS OCCUPATIONAL EXPOSURE CONTROL PLAN**

### **13.7.1 Purpose and Scope**

The purpose of this Plan is to establish a preventative safety program for Department employees who could be or are exposed to Bloodborne Pathogens. This Plan applies to Department Motor Carrier Compliance law

enforcement officers and Department divers who are required as part of their job to render emergency care or have other duties that may expose them to Bloodborne Pathogens. This Plan also applies to other Department employees who may have unanticipated exposure to Bloodborne Pathogens.

**13.7.1.1 The Plan Does Not Apply To Contractors, Consultants, Contract Employees And Other Non-Department Employees.**

**13.7.2 References**

***Section 284.50, Florida Statutes; Executive Order 2000-292; 29 CFR 1910.1030.***

**13.7.3 Definitions**

- (A) Blood** - Human blood, human blood components, and products made of human blood.
- (B) Bloodborne Pathogens** - Pathogenic microorganisms that are present in human blood and other body fluids, which can cause disease in humans. These pathogens include, but are not limited to, Hepatitis B virus (HBV) and human immunodeficiency virus (HIV).
- (C) Confidential Medical Record** - Means a confidential medical record required to be established for each employee with occupational exposure.
- (D) Contaminated** - Presence or reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.
- (E) Contaminated Laundry** - Uniforms which have been soiled with blood or other potentially infectious materials on an item or surface.
- (F) Decontamination** - The use of physical or chemical means to remove, inactivate, or destroy Bloodborne Pathogens on a surface or item to the point they are no longer capable of transmitting infectious particles, and the surface or item is rendered safe for handling, use or disposal.
- (G) Engineering Controls** - Controls that isolate or remove Bloodborne Pathogens from the workplace.
- (H) Exposure Incident** - An occupational exposure (skin, eye, mucous membrane) or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties while rendering First Aid/CPR and/or performing post event clean-up.

- (I) **HBV** - Hepatitis B Virus.
- (J) **HIV** - Human Immunodeficiency Virus.
- (K) **Hand-Washing Facilities** - A facility providing an adequate supply of running potable water, soap, and single use towels or hot air-drying machines.
- (L) **Occupational Exposure** - Reasonably anticipated skin, eye, mucous membrane or parenteral contact with blood or other potentially infectious materials (OPIM) that may result from the performance of an employee's duties. This determination is made regardless of the use of personal protective equipment.
- (M) **Other Potentially Infectious Materials (OPIM)** - These materials include the following bodily fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, and saliva.
- (N) **Potentially Infectious Materials** – Materials containing or visibly contaminated with a body fluid. Other potentially infectious materials also include any unfixed tissue or organ (other than intact skin) from a human (living or dead); HIV containing cell or tissue cultures, organ cultures, and HIV or HBV containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with Human HIV or HBV.
- (O) **Parenteral** - The action of piercing mucous membranes or the skin barrier through such events as needle sticks, human bites, cuts, and abrasions.
- (P) **Personal Protective Equipment (PPE)** - Specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g. uniforms, pants, shirts, or blouses) not intended to function as protection against a hazard, are not considered to be PPE.
- (Q) **Regulated Waste** - Liquid or semi-liquid blood or other potentially infectious materials and contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed. Regulated waste also includes items that are caked with dried blood or other potentially infectious materials and can release these materials during handling, such as: contaminated sharps, pathological, and microbiological wastes containing blood or other potentially infectious materials.
- (R) **Source Individual** - Any individual, living or dead, whose blood or other potentially infectious fluids may be a source of occupational exposure to the employee.



- (S) **Sterilize** - The use of physical or chemical procedures to destroy all microbial life.
- (T) **Universal Precautions** - An infection control approach in which all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other Bloodborne Pathogens.
- (U) **Virus** - Microorganisms that can only grow in the cells of other organisms.

#### 13.7.4 Responsibilities

- (A) **Unit Management** - Each Unit Manager/Cost Center Manager is responsible for assuring the requirements of this Plan are implemented in his/her area of responsibility.
- (B) **Unit Safety Personnel** - Unit safety personnel/designated safety persons shall ensure that this Plan is followed and aid the unit regarding its implementation.
- (C) **Supervisors** - Supervisors are responsible for assuring that training is conducted for employees designated as first aid responders and that the Plan is implemented in areas within their jurisdictional control.
- (D) **Employees** - Employees designated as first aid responders are responsible for complying with the requirements of this Plan. All employees are responsible for reporting all exposure incidents including unanticipated exposures immediately to their supervisor.

##### 13.7.4.1 Exposure Determination/ Designated First Aid Responders

Exposure to blood or OPIM may occur whenever an employee performs First Aid or CPR on another employee or while performing their job duties. The Department has designated divers as first aid responders. The Department has not designated other employees as first aid responders.

##### 13.7.4.2 Training

- (A) Unit Managers/Cost Center Managers shall ensure that all employees designated as first aid responders receive annual training on Bloodborne Pathogens. Training will be done in accordance with the Department course entitled "***Prevention of Bloodborne Diseases in the Workplace,***" **Course No. ST-09-0028**. At a minimum, training shall address the following:
  - (1) The Exposure Control Plan and its location in the Unit.

- (2) A general discussion of the epidemiology and symptoms of blood borne diseases.
- (3) Modes of transmittal and routes of entry.
- (4) Recognition of tasks and other activities that may involve exposure to blood or other potential infectious material.
- (5) Explanation of the use and limitations of methods that prevent or reduce exposure, including engineering controls, work practice controls, and personal protective equipment.
- (6) Information on types, usage, location, removal, handling, decontamination, and disposal of personal protective equipment associated with first aid response.
- (7) Explanation of the selection of personal protective equipment.
- (8) Information on the Hepatitis-B vaccination, including its efficacy, safety, method of administration and benefits of the vaccination, and the fact that it is provided free of charge.
- (9) Information on emergency procedures in case of an accident involving blood or other potential infectious materials.
- (10) Explanation of procedures to follow if an exposure incident occurs, including the method of reporting the incident and medical follow-up.
- (11) Information on the post-exposure evaluation and the required follow-up.
- (12) Explanation of signs, labels, and color-coding required by the regulations.
- (13) Disposal of biohazard waste materials.
- (14) Opportunity to ask questions of the trainer.

#### **13.7.4.3 Record Keeping**

- (A) Medical records will be kept in the District/Central Personnel Office file for all employees with occupational exposure, which will include the following:
  - (1) Name and Social Security number of the employee.

- (2) Employee Hepatitis-B vaccination status, including date of vaccination, records relating to employee's ability to receive the vaccine, and signed declination form, where applicable.
  - (3) Copy of results of examinations, medical testing, and follow-up procedures.
  - (4) Health care professional's written opinion.
  - (5) All information provided to the evaluating health care professional in the event of an exposure incident.
- (B) Medical records will be kept **confidential** and not be discussed or reported without the employee's express written consent. Records shall be maintained for at least the duration of employment plus **thirty (30) years** as required by the bloodborne pathogen standard.
- (C) Training records will also be recorded in **Learning Curve** and shall include:
- (1) Date of training
  - (2) Outline of training described in the **Learning Curve Course Catalog**,
  - (3) Name of instructor, and
  - (4) Names of attendees.

### 13.7.5 Methods of Control

13.7.5.1 The following methods of preventive controls shall be practiced minimizing the potential for exposure:

- (A) **Universal Precautions** - An approach to infection control where all human blood or certain human body fluids are treated as if known to be infectious of HIV, HBV and other bloodborne pathogens.

*Note: Whenever possible the injured employee, if physically able, will perform self-aid and clean up so as not to expose other employees to blood and other body fluids.*

- (B) **Engineering Controls** - Engineering controls are devices, which isolate or minimize Bloodborne Pathogen hazards from the workplace. Engineering controls can be designed into the workplace operations, cleaning or maintenance programs to minimize potential exposure. Examples of engineering controls can be as simple as a broom and dustpan, hand

washing facilities, or antiseptic hand cleaners. Engineering controls need to be reviewed and updated annually.

**(C) Work Practice Controls** - Work practice controls are designed to help minimize or eliminate exposure to Bloodborne Pathogens. The following work practice controls, at a minimum, shall be observed:

- (1)** Employees shall wash their hands immediately, or as soon as feasible, after removal of contaminated gloves or other personal protective equipment.
- (2)** Following any contact with blood or any other infectious materials, employees shall wash their hands and any other exposed skin with soap and water as soon as possible and flush exposed mucous membranes with water.
- (3)** Equipment, which becomes contaminated, is examined prior to servicing or shipping, and decontaminated as necessary.
- (4)** Ensure that an appropriate biohazard warning label, available from the warehouse, is attached to any contaminated equipment, identifying the contaminated portions. All affected employees, handlers, and shippers will be informed of the remaining contamination.

**(D) First Aid/CPR Safe Work Practices** - The following safe work practices shall be observed by designated employees while rendering First Aid and CPR.

- (1)** Gloves shall be always worn when rendering First Aid/CPR.
- (2)** Gloves shall be worn when handling items or touching surfaces that may be potentially contaminated with blood or OPIM.
- (3)** Other personal protective equipment should be worn if there is a possibility the employee will be exposed to blood or OPIM to include face shields and/or protective and disposable gowns/aprons.
- (4)** Hands and other skin surfaces shall be washed immediately and thoroughly with water and soap, or antiseptic cleanser, if contaminated with blood or OPIM.
- (5)** Hands shall be immediately washed after gloves are removed.

- (6) Employees shall not handle sharp objects without proper personal protective equipment and use of mechanical means such as tongs, or a dustpan and broom.
  - (7) Uniform clothing, supplied by the Department, which becomes contaminated with blood or OPIM during responses shall be removed immediately (or as soon as possible) and separated from other soiled clothing until properly laundered. Contaminated clothing shall be placed in designated containers and labeled per the uniform contractor's requirements and placed in a safe area. The uniform contractor will be informed of the contaminated clothing and have it removed as soon as possible.
  - (8) Personal clothing that becomes contaminated (not supplied uniforms) shall be removed and changed immediately (or as soon as possible). Soiled clothing shall be placed in appropriate areas in a labeled container for cleaning or disposal. Dry cleaning is an acceptable means of decontamination.
  - (9) Areas and equipment which become contaminated with blood or OPIM shall be cleaned immediately with a bleach solution **(1:10 dilution of household bleach into water)**.
  - (10) The employee who has an exposure incident shall receive a medical evaluation immediately, which may include Hepatitis-B vaccination on the recommendation of a health care professional. Complete **Form No. 500-000-07, Employees Declination Statement**, if employee declines the vaccination. This form when completed shall be treated as **confidential medical record** and shall be filed accordingly.
  - (11) Where hand washing facilities are not immediately available, appropriate antiseptic hand cleaner in conjunction with clean cloth/paper towels or antiseptic towelettes shall be provided. Employees shall wash with soap and running water as soon as possible.
- (E) **Incidental Exposure During Clean up** - The following safe work practices apply to exposure incidents that may occur to persons who may be designated to perform clean up. Every conceivable practice is not necessarily listed and evaluation of every action considering possible exposure shall be considered before proceeding, including training of such designated persons.
- (1) Gloves shall be worn during a cleanup that could present exposure of blood or OPIM and hands will be washed after gloves are removed.

- (2) Other personal protective equipment must be worn if there is a possibility the employee will be exposed to blood or OPIM to include face shields and/or eye protection and disposable gowns/aprons.
- (3) Incident sites where blood or OPIMs are present shall be disinfected before cleanup begins.
- (4) Personal protective equipment (i.e., gloves) shall be worn and proper equipment (i.e., dustpan) used in handling broken glassware or other sharp objects. Sharp objects shall be placed in designated containers and disposed of in an acceptable manner.
- (5) Uniform clothing, supplied by the Department, which becomes contaminated with blood or OPIM during clean up shall be removed immediately (or as soon as possible) and separated from other soiled clothing until properly laundered. Contaminated clothing shall be placed in designated containers and labeled per the uniform contractor's requirements and placed in a safe area. The uniform contractor will be informed of the contaminated clothing and have it removed as soon as possible.
- (6) Personal clothing that becomes contaminated shall be removed and changed immediately (or as soon as possible). Contaminated clothing shall be placed in a labeled container for cleaning or disposal. Dry cleaning is an acceptable means of decontamination.
- (7) If an employee has an exposure incident while performing cleanup, the employee shall receive a medical evaluation immediately, which may include Hepatitis-B vaccination. Complete **Form No. 500-000-07, Employee Declination Statement**, if employee declines the vaccination. This form when completed shall be treated as confidential medical record and shall be filed accordingly.
- (8) Where hand-washing facilities are not feasible, appropriate antiseptic hand cleanser in conjunction with clean cloth/paper towels or antiseptic towelettes shall be provided. Employees shall wash with soap and running water as soon as feasible.

### 13.7.6 Personal Protective Equipment (PPE)

13.7.6.1 The purpose of PPE is to eliminate or minimize the likelihood that blood or OPIM will contact the employee's skin, eyes, mucous membranes, or clothing. Necessary equipment shall be supplied and kept accessible for employee use at no cost; employees shall be trained in their use. Equipment shall be correctly worn and removed to prevent exposures. To ensure that

personal protective equipment is not contaminated and is in a condition to protect employees from potential exposure, the Department adheres to the following practices:

- (A) All personal protective equipment is inspected by the supervisor and repaired or replaced as needed to maintain its effectiveness.
- (B) Reusable personal protective equipment is cleaned, laundered, and decontaminated by trained personnel, as needed.
- (C) Single-use personal protective equipment or equipment that cannot be decontaminated is disposed of according to appropriate procedures.
- (D) To make sure that personal protective equipment is used as effectively as possible, employees shall adhere to the following practices when using personal protective equipment.
  - (1) Any garments contaminated by blood or other infectious materials are removed, prior to leaving a work area whenever possible.
  - (2) All potentially contaminated personal protective equipment is removed as soon as possible and prior to leaving a work area.
- (E) Gloves are worn in the following circumstances:
  - (1) Whenever employees anticipate hand contact with potentially infectious materials.
  - (2) When handling or touching contaminated items or surfaces.
- (F) Disposable gloves are replaced as soon as practical after contamination or if they are torn, punctured, or otherwise lose their ability to function as an "**exposure barrier**".
- (G) Discard utility gloves when they show signs of cracking, peeling, tearing, puncturing, or deterioration.
- (H) Masks and eye protection (such as goggles, face shields, etc.) are used whenever splashes or sprays may generate droplets of infectious materials.
- (I) Place used protective equipment in designated containers for decontamination or disposal.

### 13.7.7 Housekeeping

**13.7.7.1** Equipment and work areas shall be kept clean and sanitary. Bins, pails, and other containers shall be inspected regularly and kept clean and sanitary. Broken glass or other contaminated material, which can cause a puncture, or cut to the skin shall be picked up with mechanical means (e.g., dustpan, tongs, etc.). Contaminated uniforms shall be contained in a leak-proof container and labeled. Arrangements must be made with the uniform contractor for pick up.

**13.7.7.2** Unit Managers/Cost Center Manager shall ensure that all regulated wastes are handled according to federal, state, and local county/city codes. The following are minimum requirements for handling and disposing of regulated waste:

- (A) Regulated waste is discarded or "bagged" in containers that are:
  - (1) Closable.
  - (2) Puncture-resistant, if the discarded materials have the potential to penetrate the container.
  - (3) Leak-proof, if the potential for fluid spill or leakage exists.
  - (4) Red in color or labeled with the appropriate biohazard warning label.
- (B) Containers for this regulated waste are placed in appropriate locations in the facility within easy access of employees.
- (C) Waste containers are maintained upright, routinely replaced, and not allowed to overfill.
- (D) Contaminated laundry is handled as little as possible and is not sorted or rinsed where it is used.
- (E) Whenever employees move containers of regulated waste from one area to another, the containers are immediately closed and placed inside a secondary container if leakage is possible from the first container.
- (F) All materials to be disposed of will be properly labeled, packaged, temporarily stored away from employees, and then promptly picked up by an approved vendor.

**13.7.8 Decontamination**

Equipment decontamination will be accomplished by using a 1/10 solution of bleach and water. The area will be wiped down with disposable towels, and then the bleach/water solution will be applied to the area.



### 13.7.9 Hepatitis-B Vaccination

13.7.9.1 To protect from the possibility of Hepatitis B infection, vaccination is available, at no cost, to all Department divers who have occupational exposure to blood or other potentially infectious materials unless:

- (A) The employee has previously received the series;
- (B) Antibody testing reveals that the employee is immune;
- (C) Medical reasons prevent the taking of the vaccination; or
- (D) The employee chooses not to participate.

13.7.9.2 All employees designated as first aid responders are strongly encouraged to receive the Hepatitis B vaccination series. However, if an employee chooses to decline HB vaccination, **Form No. 500-000-07, Employee Declination Statement** must be filled out. This form when completed shall be treated as **confidential medical record** and shall be filed accordingly. An employee who declines may request and obtain the vaccination later and at no cost.

13.7.9.3 The vaccination consists of a series of three (3) inoculations over a six (6) month period, performed under the supervision of a licensed physician or other health care professional.

13.7.9.4 **Hepatitis B Vaccine:** Employees who have been offered Hepatitis B vaccine shall be listed using **Form No. 500-000-05, List of Employees Offered the Hepatitis-B Vaccine**. This form when completed shall be treated as confidential medical record and shall be filed accordingly.

### 13.7.10 Post-Exposure Evaluation and Follow-Up

13.7.10.1 Should an exposure incident occur, the employee shall inform his/her supervisor immediately. Each exposure incident must be investigated and documented on **Form No. 500-000-04, Exposure Incident Report**, by the Supervisor. The Unit's Safety and Health Specialist/designated safety person will assist in the investigation, as needed. This form when completed shall be treated as **confidential medical record** and shall be filed accordingly.

13.7.10.2 A confidential medical evaluation and follow-up shall be conducted immediately and the following tasks performed:

- (A) Document the routes of exposure and how the exposure occurred.

- (B) Identify the source individual unless infeasible or prohibited under **Section 381.004, F.S.**
  - (C) Obtain consent and test source individuals as soon as possible to determine HIV and HBV infectivity and document the source's blood test result.
  - (D) Collection and testing of employee's blood for HBV and HIV serological status (employee's consent required).
- 13.7.10.3** The health care professionals responsible for an employee's Hepatitis B vaccination and post-exposure evaluation and follow-up must be provided the following information:
- (A) A copy of the **Bloodborne Pathogen Standard**.
  - (B) A description of the affected employee's duties as they relate to the employee's exposure incident.
  - (C) Route(s) of exposure and circumstances of exposure.
  - (D) A copy of the exposed individual's medical records, including **Form No. 500-000-06, Employee Hepatitis B Vaccination Status**.
  - (C) Result of the source individual's blood test, if possible.
- 13.7.11 Health Care Professional's Written Opinion**
- 13.7.11.1** After the evaluation, the health care professional will provide the Department with a written opinion within (15) days after the completion of the evaluation. A copy of this opinion will be furnished to the exposed employee. In keeping with the emphasis on confidentiality, the written opinion will contain only the following information:
- (A) For Hepatitis B vaccinations, whether vaccination is recommended for the exposed employee and if the employee has received the Hepatitis B vaccination.
  - (B) For post-exposure evaluation and follow-up, whether or not the employee has been informed of the results of the medical evaluation and any medical conditions which may require further evaluation and treatment.
  - (C) All other diagnoses will remain confidential and will not be included in the written report to the Department.
- 13.7.12 Labels**

**13.7.12.1** The following items (if applicable) must be labeled properly:

- (A) Containers for regulated waste.
- (B) Laundry bags and containers.
- (C) Contaminated equipment.

**13.7.12.2** Labels affixed to contaminated equipment should indicate which portions of the equipment are contaminated.

**13.7.13**      **Forms**

These forms are available from the Department's Forms Library

Form 500-000-07, Employee Declination Statement

Form 500-000-05, List of Employees Offered the Hepatitis-B Vaccine

Form 500-000-06, Employee Hepatitis-B Vaccination Status

Form 500-000-04, Exposure Incident Report

***Note:** These forms, when completed, shall be treated as confidential medical records and shall be filed accordingly.*

**13.8**            **LABORATORY SAFETY PROGRAM**

To prevent employee exposure to hazardous materials, Materials Laboratories shall develop and implement a Chemical Hygiene Plan (CHP). The CHP will include checklists for monitoring compliance with mandatory regulations and standards and non-mandatory prudent practices for laboratory safety. All CHPs shall be submitted to the State Safety Office for approval. The State Safety Office shall perform **Quality Assurance Reviews** to evaluate compliance with the CHP.

**13.8.1**        **Definitions**

- (A) **Action level** - A concentration for a specific substance, calculated as an eight (8) hour time weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance. Typically, it is one-half that of the Permissible Exposure Limit (PEL) for that substance.

- (B) **Asphyxiate** - A chemical (gas or vapor) that can cause death or unconsciousness by suffocation. Simple asphyxiates such as nitrogen either use-up or displace oxygen in the air. They are especially dangerous in confined or enclosed spaces. Chemical asphyxiates, such as carbon monoxide and hydrogen sulfide, interfere with the body's ability to absorb or transport oxygen to the tissues.
- (C) **Carcinogen** - Any substance that causes the development of cancerous growths in living tissue, either those that are known to induce cancer in man or animals or experimental carcinogens that have been found to cause cancer in animals under experimental conditions.
- (D) **C.A.S. Number** - Identifies a particular chemical by the Chemical Abstracts Service, a service of the American Chemical Society that indexes and compiles abstracts of worldwide chemical literature called "Chemical Abstracts". These numbers are always contained in brackets.
- (E) **CFR** - Code of Federal Regulations
- (F) **Chemical Hygiene Plan (CHP)** - A written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment, and work practices that are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace and meets the requirements of **29 CFR 1910.1450(e)**.
- (G) **Chronic Exposure** - A series of exposures occurring over a long period of time.
- (H) **Combustible** - Capable of burning, generally in air under normal conditions of ambient temperature and pressure, unless otherwise specified. Combustion can occur in cases where an oxidizer other than the oxygen in air is present, e.g., chlorine, fluorine, or chemicals containing oxygen in their structure.
- (I) **Corrosive** - Any gas, liquid, or solid that causes destruction of human tissue or a liquid that has a severe corrosion rate on steel. Generally, a substance that has a very low or a very high pH.
- (J) **Designated Area** - An area which may be used for work with "select carcinogens, reproductive toxins, or substances which have a high degree of acute toxicity. A designated area may be the entire laboratory, an area of a laboratory, or a device such as a laboratory hood. A designated area shall be placarded to reflect the designated hazard.

(K) **Dose** - The concentration of a substance and the time during which the exposure occurs. The dose received links to hazard and toxicity.

(L) **Emergency Spills** - Accidental chemical discharges that present an immediate danger to personnel and/or the environment.

*Note: Under these circumstances, leave the spill site immediately and send for help. Management of these spills is the responsibility of specially trained and equipped personnel.*

(M) **Employee** - An individual employed in a laboratory workplace that may be exposed to hazardous materials during his or her assignments.

(N) **Fires**

**Class A** Fires in ordinary combustible materials such as wood, cloth, paper, rubber, and many plastics.

**Class B** Fires in flammable liquids, oils, greases, tars, oil-based paints, lacquers, and flammable gases.

**Class C** Fires that involve energized electrical equipment where the electrical conductivity of the extinguishing medium is of importance; when electrical equipment is de-energized, extinguishers for class A or B fires may be safely used.

**Class D** Fires in combustible metals such as potassium, sodium, lithium, magnesium, titanium, and zirconium.

(O) **Flammable** - Any substance which may be classified as:

(1) **Flammable Gas** - A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or a gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12 percent by volume, regardless of the lower limit.

(2) **Flammable Liquid** - Any liquid having a flashpoint at or below 199.4°F (93°C). **[29 CFR 1910.106(a)(19)]**

- (3) **Flammable Solid** - A solid, other than a blasting agent or explosive, that is liable to cause fires through friction, absorption of moisture, spontaneous chemical change, retained heat from processing, or which can be ignited readily, and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered a flammable solid if, when tested by the method described in **16 CFR 1500.44**, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.
- (P) **Hazard** - The possibility that exposure to a substance will cause injury when a specific quantity is used under certain conditions.
- (Q) **Health Hazard** - A substance for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. This term includes carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes.
- (R) **IDLH** - Immediately dangerous to life or health concentrations represent the maximum concentration from which one could escape within 30 minutes without a respirator and without experiencing any escape-impairing (e.g., severe eye irritation) or irreversible health effects.
- (S) **Incompatible** - The term applied to two substances to indicate that one material cannot be mixed with the other without the possibility of a dangerous reaction.
- (T) **Ingestion** - Taking a substance into the body through the mouth as food, drink, medicine, or unknowingly as on contaminated hands or cigarettes, etc.
- (U) **Inhalation** - The breathing in of an airborne substance that may be in the form of gases, fumes, mists, vapors, dusts, or aerosols.
- (V) **Irritant** - A substance that produces an irritating effect when it contacts skin, eyes, nose, or respiratory system.
- (W) **Lethal Concentration** - The concentration of an air contaminant that will kill 50 percent of the test animals in a group during a single exposure.

- (X) **Minor Spills** - Small chemical leaks that usually are detected early and present no immediate danger to personnel or the environment. These are spills that can be safely corrected with the advice of knowledgeable laboratory or supervisory personnel.
- (Y) **Safety Data Sheet (SDS)**. The Hazard Communication Standard (HCS). *[29 CFR 1910.1200]*
- (Z) **NFPA** - The National Fire Protection Association is a voluntary membership organization whose aims are to promote and improve fire protection and prevention. NFPA has published several volumes of codes known as the National Fire Codes.
- (AA) **OSHA** -The Occupational and Safety Health Administration is a federal or state agency under the Department of Labor that publishes and enforces safety and health regulations for most businesses and industries in the United States.
- (BB) **Oxidizer** - A substance such as chlorate, permanganate, inorganic peroxide, nitrocarbonitrate, or a nitrate that yields oxygen readily to stimulate the combustion of organic matter.
- (CC) **Oxygen Deficiency** - An atmosphere having less than the normal percentage of oxygen found in ambient air. Ambient air contains approximately 21% oxygen at sea level.
- (DD) **Permissible Exposure Limit (PEL)** - An exposure limit that is published and enforced by OSHA as a legal standard. PEL may be either a time-weighted-average (TWA) exposure limit (8 hour), a 15-minute short term exposure limit (STEL), or a ceiling (C). The PELs are found in **Tables Z-1, Z-2, or Z-3 of 29 CFR 1910.1000**. This level of exposure is deemed to be the maximum safe concentration and is generally the same value as the threshold limit value (TLV).
- (EE) **Personal Protective Equipment (PPE)** - Any device or clothing worn by the worker to protect against hazards in the environment. Examples are respirators, gloves, and chemical splash goggles.
- (FF) **Reactive** - A substance that, by itself, is readily capable of detonation, explosive decomposition, or explosive reaction at normal or elevated temperatures and pressures.
- (GG) **Respirator** - A device which is designed to protect the wearer from inhaling harmful contaminants.

- (HH) Respiratory Hazard** - A particular concentration of an airborne contaminant that, when it enters the body by way of the respiratory system or by being breathed into the lungs, results in some bodily function impairment.
- (II) Sensitizer** - A substance that may cause no reaction in a person during initial exposures, but afterwards, further exposures will cause an allergic response to the substance.
- (JJ) Short Term Exposure Limit** - Represented as STEL or TLV-STEL, it is the maximum concentration to which workers can be exposed for a short period of time (15 minutes) no more than four times throughout the day with at least one hour between exposures.
- (KK) Threshold Limit Value (TLV)** - Airborne concentrations of substances devised by the American Conference of Governmental Industrial Hygienists (ACGIH) that represents conditions under which it is believed nearly all workers may be exposed day after day with no adverse effect. TLVs are advisory exposure guidelines, not legal standards that are based on evidence from industrial experience, animal studies, or human studies when they exist. There are three different types of TLVs: Time Weighted Average (TLV-TWA), Short Term Exposure Limit (TLV-STEL), and Ceiling (TLV-C). (See also PEL.)
- (LL) Time Weighted Average** - (TLV-TWA, Threshold Limit Value-Time Weighted Average) The time weighted average airborne chemical concentration for a normal eight-hour work day and a 40-hour work week to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.
- (MM) Toxic** - Substances such as carcinogens, irritants, or poisonous gases, liquids, and solids which are irritating to or affect the health of humans.
- (NN) Toxicity** - The potential of a substance to exert a harmful effect on humans or animals and a description of the effect and the conditions or concentrations under which the effect takes place.
- (OO) Vapor** - The gaseous form of substances which are normally in the liquid or solid state (at normal room temperature and pressure).
- (PP) Water Reactive** - Substances that react violently when in contact with water. They can be either flammable solids or corrosives.

### 13.8.2 Permissible Exposure Limits



For laboratory uses of OSHA regulated substances, the Unit Manager/Cost Center Manager shall assure that laboratory employees' exposures to such substances do not exceed the permissible exposure limits specified in **29 CFR 1910, Subpart Z**.

### 13.8.3 Employee Exposure Determination

- (A) Initial monitoring: The Unit Manager/Cost Center Manager shall measure the employee's exposure to any substance regulated by a standard which requires monitoring if there is reason to believe that exposure levels for that substance routinely exceed the action level (or in the absence of an action level, the PEL).
- (B) Periodic monitoring: If the initial monitoring discloses employee exposure over the action level (or in the absence of an action level, the PEL), the Unit Manager/Cost Center Manager shall immediately comply with the exposure monitoring provisions of the relevant standard (**29 CFR 1910.1450, Occupational Exposures to Hazardous Chemical in Laboratories and the Chemical Hygiene Plan**).
- (C) Termination of monitoring: Monitoring may be terminated when there is no reason to believe that exposure levels routinely exceed the action level (or in the absence of an action level, the PEL).
- (D) Employee notification of monitoring results: The Unit Manager/Cost Center Manager shall, within 15 working days after the receipt of any monitoring results, notify the employee of these results in writing either individually or by posting results in an appropriate location that is accessible to employees.

### 13.8.4 Chemical Hygiene Plan

- (A) All Department materials testing and research laboratories, shall develop and carry out the provisions of a written CHP which is:
  - (1) Capable of protecting employees from health hazards associated with hazardous chemicals in that laboratory; and,
  - (2) Capable of keeping exposures below the PEL (specified in **Paragraph (c)** of **CFR 1910.1450, Occupational Exposures to Hazardous Chemical in Laboratories**).
- (B) The CHP shall be readily available to employees. Additionally, all staff should be held responsible for reviewing the information of the CHP. A "read and understood" document should be signed by all lab staff.

- (C) The CHP shall include each of the following elements and shall indicate specific measures that the Unit Manager/Cost Center Manager will take to ensure laboratory employee protection:
- (1) Standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals;
  - (2) Criteria that the Unit Manager/Cost Center Manager will use to determine and implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of personal protective equipment, and hygiene practices; particular attention shall be given to the selection of control measures for chemicals that are known to be extremely hazardous;
  - (3) A requirement that fume hoods and other protective equipment are functioning properly and specific measures that shall be taken to ensure proper and adequate performance of such equipment;
  - (4) Provisions for employee information and training as prescribed in **Section 13.8.5** of this **Manual**;
  - (5) A requirement that signs identify specific hazards and provide safety instructions is posted in the laboratory;
  - (6) The circumstances under which a particular laboratory operation, procedure or activity shall require prior approval from the Unit Manager/Cost Center Manager before implementation;
  - (7) Provisions for medical consultation and medical examinations in accordance with **Section 13.8.6** of this **Manual**;
  - (8) Designation of personnel responsible for implementation of the Chemical Hygiene Plan, including the assignment of a Chemical Hygiene Officer;
  - (9) Provisions for additional employee protection for work with particularly hazardous substances. These include "select carcinogens," reproductive toxins, and substances which have a high degree of acute toxicity. Specific consideration shall be given to the following provisions which shall be included where appropriate:
    - (a) Establishment of a designated area;
    - (b) Use of containment devices such as fume hoods or glove boxes;

- (c) Procedures for safe removal of hazardous waste; and
  - (d) Decontamination procedures.
- (D) The State Safety Office shall notify all the Materials Office Laboratories of any changes/revisions to applicable CFR provisions.

### 13.8.5 Employee Information and Training

- (A) The Unit Manager/Cost Center Manager shall provide employees with information and training to ensure that they are apprised of the hazards of chemicals present in their work area.
- (B) Such information shall be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. The frequency of refresher information and training shall be determined by the Unit Manager/Cost Center Manager.
- (C) Employees shall be informed of:
- (1) The contents of **29 CFR 1910.1450** and its appendices, which shall be made available to employees;
  - (2) The location and availability of the Laboratory's CHP;
  - (3) The permissible exposure limits for OSHA regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable OSHA standard;
  - (4) Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory; and,
  - (5) The location and availability of known reference material on the hazards, safe handling, storage, and disposal of hazardous chemicals found in the laboratory including, but not limited to, SDS received from the chemical supplier.
- (D) Employee training shall include:
- (1) Methods and observations that may be used to detect the presence or release of a hazardous chemical (such as monitoring conducted by the Unit Manager/Office Head, continuous monitoring devices, etc.);

- (2) The physical and health hazards of chemicals in the work area and the measures employees can take to protect themselves from these hazards including specific procedures that have been implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,
- (3) Employees shall be trained on the applicable details of the lab's written CHP.

### **13.8.6 Medical Consultation and Medical Examinations**

- (A) The Unit Manager/Cost Center Manager shall provide all employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances:
  - (1) Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, the employee shall be provided an opportunity to receive an appropriate medical examination;
  - (2) Where exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the PEL) for an OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance shall be established for the affected employee as prescribed by the standard and
  - 3) Whenever an event takes place in the work area such as a spill, leak, explosion, or other occurrence resulting in the likelihood of a hazardous exposure.
- (B) All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided through the Department's Managed Care Provider.
- (C) The Unit Manager/Cost Center Manager shall provide the following information to the physician:
  - (1) The identity of the hazardous chemical(s) to which the employee may have been exposed;

- (2) A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and
- (3) A description of the signs and symptoms of exposure that the employee is experiencing, if any.
- (D) For examination or consultation required under this section, the Unit Manger/Cost Center Manager shall obtain a written opinion from examining physician which shall include the following:
  - (1) Any recommendation for further medical follow-up;
  - (2) The results of the medical examination and any associated tests;
  - (3) Any medical condition which may be revealed during the examination which may place the employee at increased risk as a result of exposure to a hazardous workplace; and,
  - (4) A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.
- (E) The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

### **13.8.7 Hazard Identification (Signs, Labels, and SDS)**

- (A) The Unit Manager/Cost Center Manager shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced.
- (B) The Unit Managers/ Cost Center Manager shall maintain all SDS received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees.
- (C) The Unit Manager/ Cost Center Manager shall ensure that signs are posted to designate specific hazards and safety instructions.

### **13.8.8 Use of Respirators**

- (A) Where the use of respirators is necessary to maintain exposure below permissible exposure limits, the Unit Manager/Cost Center Manager shall provide, at no cost to the employee, the proper respiratory equipment. Respirators shall be selected and used in accordance with the requirements

of the Department's Respiratory Protection Program addressed in **Section 13.3** of this manual.

### **13.8.9 Recordkeeping**

- (A)** The Unit Managers/Cost Center Manager shall establish and maintain for each employee an accurate record of any measurements taken to monitor employee exposures and any medical consultation and examinations including tests or written opinions required by the **29 CFR 1910.1450, Occupational Exposures to Hazardous Chemical in Laboratories**.
- (B)** The Unit Manager/Cost Center Manager shall assure that such records are kept, transferred, and made available in accordance with **29 CFR 1910.1020, Access to Employee Exposure and Medical Records**.

### **13.8.10 Prudent Practices in the Laboratory**

Established safety requirements and safe work practices in performing laboratory work will reduce the exposure of laboratory employees to hazardous chemicals and enable them to handle chemicals in a safe manner.

#### **13.8.10.1 Hazards of Chemicals**

Hazards of chemicals generally fall into two categories:

- (A)** Physical hazards such as fire, explosions or reaction with other chemicals;
- (B)** Health hazards developed from inhaling, ingestion, or eye or dermal.

#### **13.8.10.2 General Requirements**

The Unit Manager/Cost Center Manager of a laboratory facility shall ensure that:

- (A)** An employee, qualified by training and experience and who is familiar with the specific laboratory operation, is designated to provide technical guidance and implementation of safe laboratory work practices and procedures;
- (B)** An inventory and listing of all chemicals used in the laboratory is conducted to identify hazardous chemicals;
- (C)** Exposure levels of employees to hazardous chemicals are determined or measured by a qualified industrial hygienist;

- (D) Records are maintained of any measurement taken to monitor employee exposure;
- (E) Control measures are provided and used to reduce employee exposure, including the use of PPE;
- (F) The laboratory and the areas where chemicals are stored are well ventilated;
- (G) Fume hoods and other local ventilation devices are installed and function properly;
- (H) Employees are trained to recognize and recognize all hazardous chemicals with which they are working;
- (I) SDS are available for every hazardous chemical on site;
- (J) Eyewash fountains and showers are provided for quick drenching or flushing of the eyes and body for emergency use of employees exposed to corrosive chemicals; and
- (K) Waste chemicals are placed in labeled containers and disposed of in the approved manner.

#### 13.8.10.3 Safe Work Practices

- (A) Before starting work with hazardous chemicals, read container label information, and the **Safety Data Sheet**, and follow the precautions described.
- (B) Do not remove any container label and report to the supervisor any container without a label.
- (C) Periodically check all stored containers to make sure that containers, labels, and contents are in good condition.
- (D) Use fume hoods for any operation where chemical fumes, vapors, or dusts are released. Keep hood closed except when adjusting it.
- (E) Do not store materials in hoods or in places that can block vents or air flow.
- (F) Use PPE and clothing such as goggles, gloves, and long-sleeved clothing that has been specifically selected and provided for the operation being performed.

- (G) Waste chemicals must be placed in properly covered and labeled containers. Do not pour waste chemicals down drains or place them in regular trashcans.
- (H) Do not touch electrical equipment with wet hands or while standing on a wet surface.
- (I) Check wires and plugs to be sure they are not frayed or otherwise damaged.
- (J) Operate only equipment for which you have been trained in its proper use.
- (K) Use tongs or heat-resistant gloves when working with equipment that is hot.
- (L) Food or drink is not permitted in any laboratory or area where chemicals are used or stored..
- (M) Always wash areas of exposed skin before leaving the lab.
- (N) After completion of a task and/or at the end of the workday, clean up the work area(s).

## 13.9 HAZARD COMMUNICATION

This section provides information on how employees can have access to information on hazards of chemicals and how to recognize and handle chemicals used in the workplace.

### Container Labeling

- (A) Supervisors shall ensure that all containers of chemicals used in the workplace are labeled, tagged, or marked with information giving the identity of the chemical and the appropriate hazard warnings, including portable containers, except those portable containers into which the chemical(s) are transferred from labeled containers, and which are intended **only** for the immediate same day use of the employee who performs the transfer.
- (B) Employees must not deface or remove container labels and shall immediately report any missing or defaced labels to their supervisors.

### 13.9.1 Chemical Inventory

- (A) Supervisors shall make a list of chemicals in the work area for which they are responsible. The list must include the chemical name, where used (for example, crew operation), and where the SDS are located.



- (B) Products with chemical ingredients used in the workplace where the duration and frequency of employee exposure to the products is determined not to be greater than exposures experienced during normal household use of the product should not be included in this list.

### 13.9.2 Safety Data Sheets (SDS)

- (A) The supervisor shall maintain copies of **Safety Data Sheets** in his/her office for chemicals used in the workplace/shop or field activity for which he/she is responsible. Employees shall always have access to the SDS sheets.
- (B) The local warehouse and/or supervisor will maintain a master copy of all **SDS** currently used.

### 13.9.3 Training

Training can consist of a computer-based training program that covers the elements of the Hazardous Communication Program and then the supervisor must review each SDS sheet with their employees based on which chemicals the crews are required to use.

#### 13.9.3.1 Employees Who Use Chemicals

- (A) Supervisors shall instruct employees (or use a CBT program):
  - (1) On the nature and effects of each chemical;
  - (2) How to read and interpret information on labels and SDS;
  - (3) On the physical and health hazards of chemicals;
  - (4) Specific procedures to provide protection such as safe work-practices, emergency procedures and use of PPE;
- (B) **Training must be accomplished** within 30 days of employment, **and when new chemicals are used.**
- (C) **Training must be documented using *Form 500-000-14, Employee Toxic Substance Training Record***, and signed by the employee, with a copy placed in the unit file.

#### 13.9.3.2 Employees Working in Vicinity of Stored Containers of Chemicals

The supervisor shall instruct employees on proper procedure for dealing with emergency situations such as leaks and spills.

### 13.9.3.3 Supervisors

Unit Managers/Cost Center Manager shall ensure that supervisors are provided the training to enable them to properly instruct their employees concerning chemicals.

### 13.9.4 Responsibilities of Other Employees

13.9.4.1 Department employees responsible for ordering and receiving chemicals shall ensure that:

- (A) Copies of **SDS** are furnished with the chemicals ordered;
- (B) Containers are appropriately labeled with the identity of contents and appropriate hazard warnings;
- (C) No chemicals are issued to employees unless **SDS** are available;
- (D) No chemicals are accepted without the appropriate labels and/or the required **SDS**;
- (E) Non-hazardous chemicals are substituted when possible.

13.9.4.2 Non-Department employees, such as contractors, contract laborers, inmates, who may encounter any hazardous chemicals during the normal course of work in Department facilities, will be provided with the following information by the supervisor.

- (A) Hazards of the chemicals
- (B) Labeling system in use
- (C) Protective measures in effect
- (D) Safe handling procedures
- (E) Location of SDS

13.9.4.3 Unit Managers/Cost Center Manager shall make sure that any contractor who brings chemicals onto Department property or worksites has copies of **SDS** available on those chemicals and that containers of those chemicals are properly labeled. The contractor is responsible for enforcing these requirements. This requirement includes cleaning services, construction work, painting or any other service where chemicals or any other hazardous material is being used.

### 13.9.5 Signs

Buildings containing chemicals shall be placarded according to the rules of the State Fire Marshal.

## 13.10 INDOOR AIR QUALITY (IAQ)

We recognize that indoor air quality is essential to employee's health and productivity. We have established the following procedures to promote indoor air quality for employees in our buildings. This written Indoor Air Quality Program applies to all FDOT facilities.

### 13.10.1 Responsibilities

Unit Managers are responsible for ensuring this program is implemented for their facilities and the following procedures are followed. A person may be designated, such as the facility manager, to be responsible for handling employee concerns/complaints about indoor air quality, conduct investigations, facilitate repairs or further investigations as necessary and maintain the required records.

District Safety Offices, Loss Control Departments or Facilities Department are responsible for monitoring the program and receiving copies of any employee complaints or potential indoor air quality issues.

### 13.10.2 Types of Building Problems

**Sick building syndrome** is a condition associated with discomfort including headache; nausea; dizziness; dermatitis; eye, nose, throat, and respiratory irritation; coughing; difficulty concentrating; sensitivity to odors; muscle pain; and fatigue. The specific causes of the symptoms are often not known but may be attributed to the effects of a combination of substances or individual susceptibility to low concentrations of contaminants. The symptoms are associated with periods of occupancy and may often disappear after the worker leaves the worksite.

**Building-related illnesses** are those for which there is a clinically defined illness of known etiology and include infections such as legionellosis and allergic reactions such as hypersensitivity diseases and are often documented by physical signs and laboratory findings.

### 13.10.3 Factors that Contribute to Indoor Air Quality

Indoor air quality is a constantly changing interaction of complex factors that affect the types, levels, and importance of pollutants in indoor environments. These factors include sources of pollutants or odors;

design, maintenance and operation of building ventilation systems; moisture and humidity; and occupant perceptions and susceptibilities. In addition, there are many other factors that affect comfort or perception of indoor air quality. According to the National Institute for Occupational Safety and Health (NIOSH) found that the primary sources of indoor air quality problems are:

(A)	Inadequate ventilation	52%
(B)	Contamination from inside building	16%
(C)	Contamination from outside building	10%
(D)	Microbial contamination	5%
(E)	Contamination from building fabric	4%
(F)	Unknown sources	13%

#### **13.10.4 Ventilation**

Ventilation includes the use of natural, dilution, local exhaust, or increased ventilation efficiency. The most effective engineering control for prevention of indoor air quality problems is assuring an adequate supply of fresh outdoor air through natural or mechanical ventilation. A major component of proper ventilation is ensuring the filters being used do not reduce the air flow. Air conditioner filters are rated based on the size of particles they will remove so it is important to install filters with the highest rating possible without reducing the air flow in the air handler. Vents must be located where they are not close to where vehicles idle, loading docks or close to vegetation. Also, failure to maintain proper temperature, humidity, and air movement in a building can lead occupants to block supply registers if they emit air that is uncomfortably hot or cold; this disrupts air flow patterns. Placement of partitions or other barriers within a space can also impair air movement. In addition, locating air supply and return registers too close together can result in an uneven distribution of fresh air and insufficient removal of airborne contaminants. Precautions must be taken to maintain comfortable thermal conditions and proper placement of supply and return registers, and furnishings.

#### **13.10.5 Management of Pollutant Sources, Both Inside and Outside the Building**

Pollutants can be generated by outdoor or indoor sources, including building maintenance activities, pest control, housekeeping, renovation or remodeling, new furnishings or finishes, and building occupant activities.

One important goal of an Indoor Air Quality Program is to minimize people's exposure to pollutants from these sources. Some of the key pollutant categories include:

- (A) **Biological contaminants.** Excessive concentrations of bacteria, viruses, fungi (including molds), dust mite allergen, and pollen may result from inadequate maintenance and housekeeping, water spills, inadequate humidity control, condensation, or may be brought into the building by occupants, infiltration, or ventilation air.
- (B) **Chemical pollutants.** Sources of chemical pollutants include tobacco smoke, emissions from products used in the building (i.e. office equipment; furniture, wall and floor coverings; and cleaning and consumer products), accidental spill of chemicals, pesticide application and gases such as carbon monoxide and nitrogen dioxide, which are products of combustion.
- (C) **Particles.** Particles are solid or liquid substances which are light enough to be suspended in the air, the largest of which may be visible in sunbeams streaming in a room. However, smaller particles that you cannot see are likely to be more harmful to health. Particles of dust, dirt, or other substances may be drawn into the building from outside such as smoke from people smoking by the entrance doors and can also be produced by activities that occur in buildings, like sanding wood or drywall, printing, copying and operating equipment.
- (D) **Water Intrusion.** Uncontrolled water intrusion into buildings (roof leaks, flooding, pipe condensation, plumbing leaks, or sewer backups) is a serious problem that has the potential to support microbial growth. All employees should routinely observe their workplace for evidence of water intrusion (i.e. roof leaks, pipe leaks). Employees should notify their supervisor immediately if they observe evidence of water intrusion so that corrective action can be taken. Ceiling tiles with water damage must be removed and replaced immediately. Carpet, and wall boards not dried within 48 hours may have to be removed to prevent or remove any mildew or mold that is now growing inside the material.
- (E) **Construction and Renovation.** Renovation work and/or new construction projects that have the potential to result in the spread of dust, stone and other small particles, toxic gases or other potentially harmful substances into occupied areas in quantities hazardous to health must be controlled in order to minimize employee exposure. The following protocol must be used to ensure that employees' exposure to potentially harmful substances is minimized:

- 1) Obtain SDS for all products to be utilized on the project and maintain on-site throughout the duration of the project.
- 2) Choose the least toxic product that is technically and economically feasible.
- 3) Consider performing the renovation/construction project when building is least occupied.
- 4) Consider temporarily relocating employees to an alternate worksite.
- 5) Notify potentially affected employees, in writing, at least 24 hours prior to commencement of chemical use or dust generation. Isolate the work area from occupied areas.
- 6) Use mechanical ventilation or local exhaust ventilation to maintain a negative pressure gradient between the work area and occupied areas.
- 7) Close off work area from other occupied areas by using barriers such as plastic or other materials to seal areas where contaminants would escape and expose workers.

If despite these preventive actions, employees are exposed to air contaminants resulting in health effects, employees must be instructed to report any work-related health symptoms to their supervisor so they can be accurately assessed and investigated when indicated.

#### **13.10.6 Preventive Maintenance Schedule for HVAC**

Preventive maintenance schedules that follow manufacturers' specifications must be in place for heating, ventilation and air conditioning systems (HVAC) systems in the workplace. Damaged and inoperable components must be repaired or replaced as appropriate and a work order to show actions taken will be completed. **Regular preventive maintenance not only ensures that the system is operating properly, but also can result in cost savings in operating efficiency as well as increased employee productivity.** The unit is required to maintain a log of preventive maintenance activities. At a minimum, the log requires the date, activity performed, and the initials of the maintenance person. If the HVAC system is serviced by an outside contractor, arrange for the service technician to update the on-site preventive maintenance log to ensure compliance with the standard. Documentation of preventive maintenance and repairs to the ventilation system are to be retained in accordance with the FDOT Retention Schedule and include the following information:

- (1) Date that preventive maintenance or repair was performed
- (2) Person or company performing the work
- (3) Documentation of:
  - (a) Checking and/or cleaning condenser coils
  - (b) Checking and/or changing air filters
  - (c) Checking and/or changing belts
  - (d) Lubrication of equipment parts
  - (e) Checking the functioning of motors
  - (f) Confirming that equipment is in operating order
  - (g) Checking for microbial growth in condensate pans or standing water

#### **13.10.7 Investigating Potential IAQ Complaints**

If employees begin to experience health symptoms that they believe are related to poor indoor air quality, they should notify their supervisor so that their concerns can be investigated. The IAQ program requires that employees' complaints be promptly investigated. IAQ investigations can be simple or very complex and technical to a degree that is beyond this Program. Employee complaint investigations should include detailed interviews with some of the affected employees. The investigation should also include a thorough inspection of the building for known irritants and allergens including new carpet, furniture, carpet cleaning, chemicals/pesticides, mold, and pollen producing plants, rodents, or insect infestation. A log of employee complaints must be maintained because this information is useful in establishing the time and location so patterns can be identified. Also, it is important for the employer to understand which employees are experiencing symptoms to first determine if the problem is isolated to one area and HVAC or the entire building and also so the supervisor can arrange for employees to seek medical attention, if needed.

#### **13.10.8 Types of Symptoms and Complaints**

The effects of IAQ problems are often nonspecific symptoms rather than clearly defined illnesses. Symptoms commonly attributed to IAQ problems include:

- (1) Headache

- (2) Fatigue
- (3) Shortness of breath
- (4) Sinus congestion
- (5) Cough
- (6) Sneezing
- (7) Eye, nose, and throat irritation
- (8) Skin irritation
- (9) Dizziness
- (10) Nausea

All these symptoms, however, may also be caused by other factors, and are not necessarily due to air quality deficiencies. “Health” and “comfort” are used to describe a spectrum of physical sensations. For example, when the air in a room is slightly too warm for a person’s activity level, that person may experience mild discomfort. If the temperature continues to rise, discomfort increases and symptoms such as fatigue, stuffiness, and headaches can appear. Some complaints by building occupants are clearly related to the discomfort end of the spectrum. One of the most common IAQ complaints is that “there’s a funny smell in here.” Odors are often associated with a perception of poor air quality, whether they cause symptoms. Environmental stressors such as improper lighting, noise, vibration, overcrowding, ergonomic stressors, and job-related psychosocial problems (such as job stress) can produce symptoms that are like those associated with poor air quality.

### **13.10.9 Responding to building-related health concerns of workers**

It is important that recording and responding to IAQ complaints be done to include an adequate and timely response. These include:

- (A) Logging all complaints or problem reports
- (B) Collecting information about each complaint
- (C) Ensuring confidentiality
- (D) Determining a plan for response



- (E) Identifying appropriate resources for response
- (F) Applying remedial action
- (G) Providing frequent feedback to building occupants regarding the complaint and response actions
- (H) Follow-up to ensure that remedial action has been effective

### 13.10.10 Notification of Employees

The facility manager or unit manager/cost center manager, must notify employees at least 24 hours in advance or promptly in emergency situations, of work to be performed on a building that may introduce air contaminants into their work area (keep in mind that some people are allergic to latex paint, dust, carpet that contains certain chemicals, etc.) This notification will also be in writing, posted on the employee bulletin board, and will identify the planned project and the start date. The notification will also include information on how to access **Safety Data Sheets (SDS)** or other hazard information. Communication with building occupants is essential for successful mold remediation. Some occupants will naturally be concerned about mold growth in their building and the potential health impacts. Occupants' perceptions of the health risk may rise if they perceive that information is being withheld from them. The status of the building investigation and remediation should be openly communicated including information on any known or suspected health risks.

### 13.10.11 Mold Information

Molds are part of the natural environment. Molds are fungi that can be found anywhere - inside or outside - throughout the year. About 1,000 species of mold can be found in the United States, with more than 100,000 known species worldwide.

Outdoors, molds play an important role in nature by breaking down organic matter such as toppled trees, fallen leaves, and dead animals. We would not have food and medicines, like cheese and penicillin, without mold.

Indoors, mold growth should be avoided. Problems may arise when mold starts eating away at materials, affecting the look, smell, and possibly, with the respect to wood-framed buildings, affecting the structural integrity of the buildings.

When excessive moisture or water accumulates indoors, mold growth often will occur, particularly if the moisture problem remains uncorrected. While it

is impossible to eliminate all molds and mold spores, controlling moisture can control indoor mold growth.

All molds share the characteristic of being able to grow without sunlight; mold needs only a viable seed (spore), a nutrient source, moisture, and the right temperature to proliferate. This explains why mold infestation is often found in damp, dark, hidden spaces; light and air circulation dry areas out, making them less hospitable for mold.

Since mold requires water to grow, it is important to prevent excessive moisture in buildings. Some moisture problems in buildings have been linked to changes in building construction practices since the 1970s, which resulted in tightly sealed buildings with diminished ventilation, contributing to moisture vapor buildup. Other moisture problems may result from roof leaks, landscaping or gutters that direct water into or under a building, or unvented combustion appliance. Delayed or insufficient maintenance may contribute to moisture problems in buildings. Improper maintenance and design of building heating/ventilating/air-conditioning (HVAC) systems, such as insufficient cooling capacity for an air conditioning system, can result in elevated humidity levels in a building.

#### **13.10.12 Health Effects**

**Currently, there are no federal standards or recommendations, (e.g., OSHA, NIOSH, EPA) for airborne concentrations of mold or mold spores.** There are many types of molds. Most typical indoor air exposures to mold do not present a risk of adverse health effects. Molds can cause adverse effects by producing allergens (substances that can cause allergic reactions). Potential health concerns are important reasons to prevent mold growth and to remediate existing problem areas.

The onset of allergic reactions to mold can be either immediate or delayed. Allergic responses include hay fever-type symptoms such as runny nose and red eyes.

Molds can also cause asthma attacks in some individuals who are allergic to mold. In addition, exposure to mold can irritate the eyes, skin, nose and throat in certain individuals. Symptoms other than allergic and irritant types are not commonly reported because of inhaling mold in the indoor environment.

#### **13.10.13 Prevention**

Moisture control is the key to mold control. When water leaks or spills occur indoors - act promptly. Any initial water infiltration should be stopped

and cleaned promptly. A prompt response (within 24-48 hours) and thorough clean-up, drying, and/or removal of water-damaged materials will prevent or limit mold growth.

Mold prevention tips include:

- (A) Fix leaking plumbing and leaks in the building envelope as soon as possible.
- (B) Watch for condensation and wet spots. Fix source(s) of moisture problem(s) as soon as possible.
- (C) Prevent moisture due to condensation by increasing surface temperature or reducing the moisture level in air (humidity). To increase surface temperature, insulate or increase air circulation. To reduce the moisture level in air, repair leaks, increase ventilation (if outside air is cold and dry), or dehumidify (if outdoor air is warm and humid).
- (D) Keep heating, ventilation, and air conditioning (HVAC) drip pans clean, flowing properly, and unobstructed.
- (E) Vent moisture-generating appliances, such as dryers, to the outside where possible.
- (F) Maintain low indoor humidity, below 60% relative humidity (RH), ideally 30-50%, if possible. Maintain temperature in the range of 68 – 76 F.
- (G) Perform regular building/HVAC inspections and maintenance as scheduled.
- (H) Clean and dry wet or damp spots within 48 hours.
- (I) Don't let foundations stay wet. Provide drainage and slope the ground away from the foundation.

**13.10.14 Questions That May Assist in Determining Whether a Mold Problem Currently Exists**

- (A) Are building materials or furnishings visibly moisture damaged?
- (B) Have building materials been wet more than 48 hours?
- (C) Are there existing moisture problems in the building?

- (D) Are building occupants reporting musty or moldy odors?
- (E) Are building occupants reporting health problems that they think are related to mold in the indoor environment?
- (F) Has the building been recently remodeled or has the building use changed?
- (G) Has routine maintenance been delayed, or the maintenance plan been altered?

### 13.10.15 Remediation Plan

Remediation includes both the identification and correction of the conditions that permit mold growth, as well as the steps to safely and effectively remove mold damaged materials.

Before planning the remediation assess the extent of the mold or moisture problem and the type of damaged materials. If you choose to hire outside assistance to do the cleanup, make sure the contractor has experience with mold remediation. Check references and ask the contractor to follow the recommendations in EPA's publication, "***Mold Remediation in Schools and Commercial Buildings***," or other guidelines developed by professional or governmental organizations.

The remediation plan should include steps to permanently correct the water or moisture problem. The plan should cover the use of appropriate personal protective equipment (PPE). It also should include steps to carefully contain and remove moldy building materials in a manner that will prevent further contamination. Remediation plans may vary greatly depending on the size and complexity of the job, and may require revision if circumstances change or new facts are discovered.

The remediation manager's highest priority must be to protect the health and safety of the building occupants and remediators. Remediators should avoid exposing themselves and others to mold-laden dusts as they conduct their cleanup activities. Caution should be used to prevent mold and mold spores from being dispersed throughout the air where they can be inhaled by building occupants. In some cases, especially those involving large areas of contamination, the remediation plan may include temporary relocation of some or all of the building occupants.

### 13.10.16 Mold Remediation/Cleanup Methods

The purpose of mold remediation is to correct the moisture problem and to remove moldy and contaminated materials to prevent human exposure and further damage to building materials and furnishings. Porous materials that are wet and have mold growing on them may have to be discarded because molds can infiltrate porous substances and grow on or fill in empty spaces or crevices. This mold can be difficult or impossible to remove completely.

Generally, simply killing the mold, for example, with biocide is not enough. The mold must be removed, since the chemicals and proteins, which can cause a reaction in humans, are present even in dead mold.

A variety of cleanup methods are available for remediating damage to building materials and furnishings caused by moisture control problems and mold growth. The specific method or group of methods used will depend on the type of material affected. Some methods that may be used include the following:

**Table 1: Water Damage - Cleanup and Mold Prevention**

Guidelines for Response to Clean Water Damage within 24-48 Hours to Prevent Mold Growth\*

<b>Water-Damaged Material†</b>	<b>Actions</b>
<b>Books and papers</b>	<ul style="list-style-type: none"> <li>• For non-valuable items, discard books and papers.</li> <li>• Photocopy valuable/important items, discard originals.</li> <li>• Freeze (in frost-free freezer or meat locker) or freeze-dry.</li> </ul>
<b>Carpet and backing - dry within 24-48 hours</b>	<ul style="list-style-type: none"> <li>• Remove water with water extraction vacuum.</li> <li>• Reduce ambient humidity levels with dehumidifier.</li> <li>• Accelerate drying process with fans.</li> </ul>
<b>Ceiling tiles</b>	<ul style="list-style-type: none"> <li>• Discard and replace.</li> </ul>

<p><b>Cellulose insulation</b></p>	<ul style="list-style-type: none"> <li>• Discard and replace.</li> </ul>
<p><b>Concrete or cinder block surfaces</b></p>	<ul style="list-style-type: none"> <li>• Remove water with water extraction vacuum.</li> <li>• Accelerate drying process with dehumidifiers, fans, and/or heaters.</li> </ul>
<p><b>Fiberglass insulation</b></p>	<ul style="list-style-type: none"> <li>• Discard and replace.</li> </ul>
<p><b>Hard surface, porous flooring</b> (Linoleum, ceramic tile, vinyl)</p>	<ul style="list-style-type: none"> <li>• Vacuum or damp wipe with water and mild detergent and allow to dry, scrub if necessary.</li> <li>• Check to make sure under flooring is dry; dry under flooring if necessary.</li> </ul>
<p><b>Non-porous, hard surfaces</b> (Plastics, metals)</p>	<ul style="list-style-type: none"> <li>• Vacuum or damp wipe with water and mild detergent and allow to dry, scrub if necessary.</li> </ul>
<p><b>Upholstered furniture</b></p>	<ul style="list-style-type: none"> <li>• Remove water with water extraction vacuum.</li> <li>• Accelerate drying process with dehumidifiers, fans, and/or heaters.</li> <li>• May be difficult to completely dry within 48 hours. If the piece is valuable, you may wish to consult a restoration/water damage professional who specializes in furniture.</li> </ul>
<p><b>Wallboard</b> (Drywall and gypsum board)</p>	<ul style="list-style-type: none"> <li>• May be dried in place if there is no obvious swelling and the seams are intact. If not, remove, discard, and replace.</li> <li>• Ventilate the wall cavity, if possible.</li> </ul>
<p><b>Window drapes</b></p>	<ul style="list-style-type: none"> <li>• Follow laundering or cleaning instructions recommended by the manufacturer.</li> </ul>

<b>Wood surfaces</b>	<ul style="list-style-type: none"><li>• Remove moisture immediately and use dehumidifiers, gentle heat, and fans for drying. (Use caution when applying heat to hardwood floors.)</li><li>• Treated or finished wood surfaces may be cleaned with mild detergent and clean water and allowed to dry.</li><li>• Wet paneling should be pried away from wall for drying.</li></ul>
<p>Even if materials are dried within 48 hours, mold growth may have occurred. Items may be tested by professionals if there is doubt. Note that mold growth will not always occur after 48 hours; this is only a guideline.</p> <p>These guidelines are for damage caused by clean water. If you know or suspect that the water source is contaminated with sewage, or chemical or biological pollutants, then Personal Protective Equipment and containment are required by OSHA. An experienced professional should be consulted if you and/or your remediators do not have expertise remediating in contaminated water situations. Do not use fans before determining that the water is clean or sanitary.</p>	

### **13.10.17 Wet Vacuum**

Wet vacuums are vacuum cleaners designed to collect water. They can be used to remove water from floors, carpets, and hard surfaces where water has accumulated. They should not be used to vacuum porous materials, such as gypsum board. Wet vacuums should be used only on wet materials, as spores may be exhausted into the indoor environment if insufficient liquid is present. The tanks, hoses, and attachments of these vacuums should be thoroughly cleaned and dried after use since mold and mold spores may adhere to equipment surfaces.

### **13.10.18 Damp Wipe**

Mold can generally be removed from nonporous surfaces by wiping or scrubbing with water and detergent. It is important to dry these surfaces quickly and thoroughly to discourage further mold growth. Instructions for cleaning surfaces, as listed on product labels, should always be read and followed.

### **13.10.19 Disposal of Damaged Materials**

Building materials and furnishings contaminated with mold growth that are not salvageable should be placed in sealed impermeable bags or closed containers while in the remediation area. These materials can usually be discarded as ordinary construction waste. It is important to package mold-contaminated materials in this fashion to minimize the dispersion of mold spores. Large items with heavy mold growth should be covered with polyethylene sheeting and sealed with duct tape before being removed from the remediation area. Some jobs may require the use of dust-tight chutes to move large quantities of debris to a dumpster strategically placed outside a window in the remediation area.

#### **13.10.20 Use of Biocides**

The use of a biocide, such as chlorine bleach, is not recommended as a routine practice during mold remediation, although there may be instances where professional judgment may indicate its use (for example, when immuno-compromised individuals are present). In most cases, it is not possible or desirable to sterilize an area, as a background level of mold spores comparable to the level in outside air will persist. However, the spores in the ambient air will not cause further problems if the moisture level in the building has been corrected.

Biocides are toxic to animals and humans, as well as to mold. If you choose to use disinfectants or biocides, always ventilate the area, using outside air if possible, and exhaust the air to the outdoors. When using fans, take care not to extend the zone of contamination by distributing mold spores to a previously unaffected area.

#### **13.10.21 Mold Remediation Guidelines**

This section presents remediation guidelines for building materials that have or are likely to have mold growth. The guidelines are designed to protect the health of cleanup personnel and other workers during remediation. These guidelines are based on the size of the area impacted by mold contamination. Please note that these are guidelines; some professionals may prefer other remediation methods, and certain circumstances may require different approaches or variations on the approaches described below. If possible, remediation activities should be scheduled during off-hours when building occupants are less likely to be affected.

**Level I: Small Isolated Areas** (10 sq. ft or less) - e.g., ceiling tiles, small areas on walls.



Remediation can be conducted by the regular building maintenance staff as long as they are trained on proper clean-up methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the **OSHA Hazard Communication Standard** ([29 CFR 1910.1200](#)).

Respiratory protection (e.g., N-95 disposable respirator) is recommended. Respirators must be used in accordance with the **OSHA Respiratory Protection Standard** ([29 CFR 1910.134](#)). Gloves and eye protection should be worn.

The work area should be unoccupied. Removing people from spaces adjacent to the work area is not necessary but is recommended for infants (less than 12 months old), persons recovering from recent surgery, immune-suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).

Containment of the work area is not necessary. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.

Contaminated materials that cannot be cleaned should be removed from the building in a sealed impermeable plastic bag. These materials may be disposed of as ordinary waste.

The work area and areas used by remediation workers for egress should be cleaned with a damp cloth or mop and a detergent solution.

All areas should be left dry and visibly free from contamination and debris.

**Level II: Mid-Sized Isolated Areas** (10-30 sq. ft.) – e.g., individual wallboard panels.

Remediation can be conducted by the regular building maintenance staff. Such persons should receive training on proper clean-up methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the **OSHA Hazard Communication Standard** ([29 CFR 1910.1200](#)).

Respiratory protection (e.g., N-95 disposable respirator) is recommended. Respirators must be used in accordance with the **OSHA Respiratory Protection Standard** ([29 CFR 1910.134](#)). Gloves and eye protection should be worn.

Surfaces in the work area that could become contaminated should be covered with a secured plastic sheet(s) before remediation to contain dust/debris and prevent further contamination.

Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.

Contaminated materials that cannot be cleaned should be removed from the building in a sealed impermeable plastic bag. These materials may be disposed of as ordinary waste.

The work area and areas used by remediation workers for egress should be HEPA vacuumed and cleaned with a damp cloth or mop and a detergent solution.

All areas should be left dry and visibly free from contamination and debris.

**Level III: Large Isolated Areas** (30 –100 square feet) – e.g., several wallboard panels.

Industrial hygienists or other environmental health and safety professionals with experience performing microbial investigations and/or mold remediation should be consulted prior to remediation activities to provide oversight for the project.

**Level IV: Extensive Contamination** (greater than 100 contiguous square feet in an area).

Industrial hygienists or other environmental health and safety professionals with experience performing microbial investigations and/or mold remediation should be consulted prior to remediation activities to provide oversight for the project.

### **13.10.22 Resolving Air Quality Problems.**

Building managers and tenants must work together to improve indoor air quality; areas to address include:

### **13.10.23 Regularly clean or replace HVAC system filters.**

Use the most efficient filters possible while still maintaining the ability to supply adequate air flow to the spaces. Ensure that filters are installed in the correct orientation relative to airflow, that they are the appropriate size, and that they are seated in the filter rack properly. Take precautions to minimize air flowing around the filters instead of through them.

**13.10.24 Regularly inspect outdoor air intakes.**

Open all outdoor air intakes that are closed. Adjust or repair those that are not working properly. Regardless of the air flow required for heating and cooling, the minimum outdoor air flow recommended by ASHRAE should always be provided to each space.

**13.10.25 Regularly inspect office building exhaust fans to make sure all are working properly.**

Dysfunctional exhaust fans can result in suboptimal pressure differences throughout the building and can create or exacerbate IEQ problems.

**13.10.26 Use less conservative cycle times for the HVAC system.**

Start the HVAC system earlier in the morning before workers arrive to reduce temperature fluctuations and control humidity levels. Simply providing a more thermally comfortable working environment may reduce the number of IEQ complaints.

**13.10.27 Never store paints, cleaners, or other chemicals in HVAC equipment rooms.**

Odors and potentially harmful vapors can easily be circulated throughout the entire space being supplied by an HVAC system.

**TRAINING:**

Courses are available within the Department that will provide for the specific safety training required of employees. Training is prescribed in **Chapter 12** of the **Manual**.

**FORMS:**

All forms, manuals, and procedures referenced in this Manual can be found in the Forms and Rules Section on the Department *Infonet* website through the following link: <http://infonet.dot.state.fl.us/>