



Lab Safety & Chemical Hygiene Plan for
Saint Joseph's University

Approved August 2015

Section I: Introduction

Saint Joseph's University (hereafter SJU) is committed to providing an environment where learning, teaching, and research occur free of recognized hazards. Pursuant to Occupational Safety and Health Administration regulations (29 CFR 1910.1450 and 1910.132), SJU establishes this Lab Safety and Chemical Hygiene Plan (hereafter CHP) to protect employees and students from potential hazards associated with storage, use, and handling Hazardous Chemicals and to ensure a safe laboratory environment.

A. Scope

The Lab Safety Plan and Chemical Hygiene Plan (CHP) applies to all laboratories at Saint Joseph's University. A laboratory is defined as a space where chemical manipulations are carried out in containers that are designed to be easily and safely manipulated by one person; where multiple chemical procedures or chemicals are used; where procedures are not part of nor simulate a production process; and where laboratory procedures, practices, and equipment are available, effective, and in common use to minimize potential for the exposure of a Laboratory Worker to Hazardous Chemicals and unsafe working conditions.

B. Responsibilities

The following are the responsibilities of various individuals for chemical hygiene in laboratories. Laboratory Workers are those personnel who conduct their work in a laboratory and are at risk of possible exposure to Hazardous Chemicals on a regular or periodic basis. These persons include laboratory technicians, instructors, graduate researchers, undergraduate researchers, student employees and part time and temporary employees or visitors working in a laboratory. All of these categories of Laboratory Workers must be trained for working in any of the laboratories.

Chemical Hygiene Officer (CHO)

This position reports to the Director of Health and Safety as it relates to the *chemical hygiene and hazardous waste management programs* with a dotted line reporting relationship to the Associate Dean, Natural Sciences, Mathematics and Computer Science division. Fully compliant EPA and OSHA programs are not only a Federal requirement but also an excellent way to protect our staff and students.

The position will advise and assist faculty and staff with training and environmental compliance needs. Establish and implement university policies and procedures that will ensure a safe and healthy environment.

Fundamental responsibilities include comprehensive inventory development, faculty, staff, student chemical training and monthly investigation and inventory update; standardize protocols and procedures for chemical disposal.

- ✚ Chemical Inventory
 - The chemical inventory is the basis from which the rest of the program is developed.

- ✚ Implementation of EPA / OSHA Compliant Plan
 - Maintain Chemical Hygiene Plan documentation
 - Summary of laboratory standard
 - Delegation of duties and responsibilities
 - General operating procedures
 - Special precautions and control measures
 - Exposure evaluations and guidelines

- ✚ Monthly review and compliance examination including employee training.

Hazardous Waste Management

- ✚ Coordinates comprehensive program of disposal of hazardous chemical waste materials or radioactive materials not governed by the existing PA DEP radioactive materials use license (coordinating with the Radiation Safety Officer).
- ✚ Conducts inspections of laboratories and facilities to ensure compliance with regulations and procedures.
- ✚ Provides training concerning hazardous materials and chemicals to campus faculty, staff, and students.
- ✚ Provides for the campus wide collection, storage, transportation, and shipping of hazardous waste.

This CHO position is based on 8 + hours per week or 25% of full time administrative position duties. The position is available 24/7 for calls on a cell phone provided by the university. Tasks have high and low peaks during the semester and summer.

The Laboratory Supervisor has the overall responsibility for compliance with CHP in his or her laboratory. This responsibility is designated by identification by the appropriate Chairperson/Dean and may not be shifted without notification to the Director of EHS or his/her designee. The responsibilities of this position are:

- Have overall responsibility for chemical hygiene in the laboratory.
- Ensure that laboratory workers know and follow the chemical hygiene rules.

- Ensure that protective equipment is available and in working order.
- Determine the required levels of PPE and equipment.
- Ensure that appropriate training has been provided.
- Provide regular, formal chemical hygiene and housekeeping inspections, including routine inspections of emergency equipment (e.g. eyewash stations and safety showers).
- Know the current legal requirements concerning regulated substances.
- Ensure that facilities and training for use of any material being ordered are adequate.
- Report unsafe acts or conditions to their Chair/Director or HSE.

Laboratory Workers

Laboratory Workers are those personnel who conduct their work in a laboratory and are at risk of possible exposure to Hazardous Chemicals on a regular or periodic basis. These persons include laboratory technicians, instructors, graduate researchers, undergraduate researchers, student employees and part time and temporary employees or visitors working in a laboratory. An employee, student, volunteer or visitor to a laboratory at Saint Joseph's University. The responsibilities are:

- Plan and conduct each operation in accord with the facility's chemical hygiene procedures, including use of PPE and engineering controls, as appropriate.
- Develop good personal chemical hygiene habits.
- Report all accidents and potential chemical exposures immediately.
- Attend required training as designated by your supervisor.
- Report unsafe acts or conditions to their Lab Supervisor.

The **Science Safety Committee (SSC)** is responsible for recommending the minimal requirements of the CHP that all laboratories at SJU must follow. The SSC will review the CHP annually.

The **SJU Department of Health, Safety, and Environmental Compliance (HSE)** is responsible for working with faculty, staff, students, and others to develop and implement chemical hygiene, use Safety Data Sheets (SDSs) and laboratory practices that maintain a safe working environment.

HSE will establish procedures to:

- Monitor the purchasing, use, and disposal of chemicals used in laboratories on campus.
- Assure, on a periodic basis, that appropriate chemical hygiene is being used and that records are maintained.
- Help Laboratory Supervisors develop precautions and adequate facilities for chemical hygiene and laboratory safety.

- Know the current legal requirements related to regulated substances and laboratory safety.
- Contact information for relevant personnel can be found in Appendix A.

Section II. General Laboratory Standard Operating Procedures and Requirements

A. Laboratory Rules

- Protective eye equipment must be worn at all times when a reasonable probability of injury from Hazardous Chemicals or other objects (e.g. flying particles, potentially injurious light radiation) poses a threat to eye health. At a minimum protective eye equipment should meet the minimum recommendations of [29 CFR 1910.133](#). Such PPE will be marked with “ANSI Z87.1”.
- Shoes or leather sneakers shall be worn in a laboratory when a reasonable probability of injury from Hazardous Chemicals or other objects/activities that pose a potential threat to exposed feet and legs is present. Sandals, canvas, perforated, or open toe shoes are not permitted when these situations exist. When working with Hazardous Chemicals, safety shoes with chemically resistant nonskid soles are recommended.
- When working near moving machinery or open flames, ties or loose jewelry shall not be worn. Long hair shall be tied behind the head.
- Work areas should remain clean and uncluttered.
- Access to emergency equipment such as safety showers, eyewash stations, fire protection equipment, and exits shall never be blocked.
- All aisles, hallways, and stairs shall be kept clear of obstructions.
- Windows located in laboratory doors should not be covered. A clear view of the lab must be visible from the corridor for safety considerations. The exception to this policy would be the occasions when a specific experiment requires the absence of light. In this situation, Laboratory Workers should not work alone.
- Laboratory Worker using a Hazardous Chemical and/or performing a hazardous procedure should not work alone in a laboratory. If the situation arises where no

other worker can be present then notification of the arrival and departure of the individual to the Laboratory Supervisor should be made.

- Each Laboratory Worker shall be aware of the location and proper operation of laboratory safety equipment including fire extinguishers, eyewash fountains, and safety showers.
- All laboratory employees that handle chemicals shall wash their hands with soap and water as necessary periodically during the day and when leaving the laboratory at the end of the day.
- Horseplay or other behavior that might confuse, startle, or distract another worker is not permitted.
- A visitor to a laboratory shall be required to abide by all of the laboratory safety rules and guidelines set forth in this document. Such visitors planning to carry out work with Hazardous Chemicals and/or hazardous procedures on a regular basis (e.g. Visiting scholar, visiting graduate/undergraduate student) are required to attend training offered by SJU HSE within a reasonable time from the beginning of such work.
- Before any radiation source or radiation producing instrument is brought into the laboratory, the Radiation Safety Officer shall be consulted to determine the safety and health requirements that are necessary to secure source licensing.

B. Laboratory Hygiene Requirements

Warning signs shall be posted at areas or on equipment where special or unusual hazards exist. For example, signs for chemical hazards may include warnings for cancer, reproductive hazard, teratogen, and mutation. Signs for physical hazards may include warnings for heat, explosions, and radiation.

Laboratory and non-laboratory areas shall be sufficiently segregated to minimize the potential for chemical exposures in office areas.

Eating, smoking, drinking, or applying cosmetics is not permitted at any time in any laboratory.

If a refrigerator, ice machine, or microwave is being used or has been used for the storage of chemicals or the carrying out of procedures using Hazardous Chemicals, then that appliance must not be used for the storage of food or beverages. Such appliances with demarked with a sign reading at a minimum: "CHEMICAL USE ONLY: NO FOOD OR DRINK".

Any glassware or utensils that are used for laboratory operations must not be used for the storage, handling, or consumption of food or beverages.

Heating of food in a laboratory or a storage area is not permitted.

Accumulations of chemicals on work surface shall be removed as soon as possible using techniques that minimize residual surface contamination.

The floor of each laboratory shall be cleaned regularly.

Section III. Chemical Hazards: Recognition, Evaluation, & Control

A. Recognition of a Hazardous Chemical/Substance

Each academic department will maintain an inventory list of all of the Hazardous Chemicals that are stored in the laboratories and stockrooms of that department. In addition, each department will have access to on-line Safety Data Sheet (SDS) for each of these Hazardous Chemicals. A master list of all of the Hazardous Chemicals in all laboratories and storage facilities will be maintained by the CHO.

Whenever a new Hazardous Chemical is received in a laboratory, the identifying information for that chemical (including its chemical name, trade name, and CAS number) shall be added to the inventory list. The SDS for the Hazardous Chemical may be a source for this information.

The labels on any incoming Hazardous Chemical shall not be removed or defaced. If a label is not legible, then the original labeling information must be replaced onto the container.

Information from the label of SDS describing the degree of hazard shall be recorded on the laboratory chemical inventory list. Sample terms are:

- DANGER!
- WARNING!
- CAUTION!

Information from the label or SDS concerning possible chronic hazards shall be recorded on the laboratory chemical inventory list. Sample terms are:

- CANCER!
- TERATOGEN!
- MUTAGEN!
- REPRODUCTIVE HAZARD!

When a National Fire Protection Association (NFPA) or Hazardous Material Identification System (HMIS) diamond is found on a label, the numerical ratings for health, flammability, and reactivity shall be noted on the laboratory chemical inventory list.

Each Departmental Resource Coordinator or other responsible employee shall keep the chemical inventory list for that departmental stockroom and all laboratories up to date and shall identify the date on each revision to the chemical inventory list for that departmental stockroom.

A hazard review for a new chemical that has not been handled previously in the laboratory shall be completed before the new chemical is handled in the laboratory. After the hazard review for the new chemical has been completed, all of the proper sections of the CHP shall be followed.

The CHO shall review chemicals never before stored on campus as they are received to determine whether special control measures are warranted.

B. Criteria for Control Measures

When evaluating whether special handling precautions are warranted, the Laboratory Supervisor and the CHO will examine a number of factors in order to formulate the handling recommendations, including:

- Potential for routine airborne exposure
- Potential for accidental airborne exposure;
- Potential for routine dermal exposure;
- Potential for accidental dermal exposure;
- Quantity of the chemical that will be used;
- Composition of mixtures containing Hazardous Chemical(s)
- Physical and chemical properties of the chemical;
- Exposure controls currently in place;
- Chemical stability of the compound;
- All available toxicological and other health effect data.
- Based on the results of the hazard evaluation, the recommendation for the special handling requirements could include:
 - Preparation of written standard operating procedures;
 - Establishment of designated handling areas;
 - Posting of warning signs;
 - Development of exposure monitoring requirements;
 - Use of fume hoods or local exhaust ventilation;
 - Special respiratory protection requirements;
 - Special Laboratory Worker hygiene requirements;
 - Special protective clothing requirements;

- Decontamination procedures;
- Procedures for removal of contaminated waste.

C. Spills of Hazardous Chemicals

In the event of a spill or the release of a Hazardous Chemical that requires the evacuation of the Science Center, immediately follow the Science Center Evacuation Plan posted by the exit door of each laboratory (Appendix B).

In the event of a spill of a Hazardous Chemical, the Laboratory Worker should alert the other laboratory personnel and notify the Laboratory Supervisor. The Laboratory Worker should immediately rinse with copious amounts of water if the chemical has made physical contact with any part of the body or clothing. This may require using the safety shower and/or eyewash. If emergency medical assistance is necessary 911 is dialed and Public Safety is alerted on Ext 1111. In addition, please contact the Director of EH&S and/or the Chemical Hygiene Officer so that proper reporting and investigations can be completed in a timely manner.

The degree of hazard resulting from the spill of a Hazardous Chemical ranges from low to high depending on factors such as: chemical toxicity, physical state, vapor pressure, reactivity, temperature, etc. When a spill occurs it must be treated as a potentially dangerous situation until the spill is cleaned up or there are positive indications that no hazard is present.

The Laboratory Supervisor will make an assessment of the spill and determine if it can be cleaned-up by a trained employee of Saint Joseph's University. This decision is based on knowing the hazards and quantity of the spilled chemical. The SDS for the Hazardous Chemical should be consulted immediately.

The cleanup of a minor hazardous liquid chemical spill can be accomplished by the use of the commercial spill absorbent located in all laboratories and stockrooms in the Science Center. If there is any question as to whether or not the spill can be safely contained, the spill is considered major and an evacuation is executed as defined in the Science Center Evacuation Plan (Appendix B).

In any SJU laboratory, the spill of a Hazardous Chemical (such as those found in the list in Appendix C) warrants special attention. This is due to high risks that these chemicals may pose during clean up. Before proceeding with the spill cleanup for any of these chemicals, be sure to consult the SDS for the procedures that are recommended for the cleanup of the chemical.

D. Storage of Chemicals and Equipment

When Highly Toxic Chemicals (see Appendix C) are stored in a laboratory or stockroom, special measures including posting of signage shall be posted to alert personnel to the presence of these chemicals.

The amount of a single toxic, flammable, or Hazardous Chemical in a laboratory shall be kept to a maximum of no more than four liters.

So that the manufacturer's recommended shelf life for a chemical is not exceeded, each chemical shall be dated when it is received. However, in consultation with the Laboratory Supervisor, expired chemicals may be used, and should not automatically be considered to be a Hazardous Waste.

Each chemical shall be stored in a container with which it is chemically compatible.

Chemical reagents shall be kept in closed containers when not in use.

When a chemical is transferred to laboratory glassware or to a container, the laboratory glassware or container shall be labeled with the identifying name or number from the label on the initial container.

No chemicals shall be brought into or stored in laboratory offices, equipment storage rooms, or other locations that are not specifically designated for chemical use or storage.

Laboratory chemicals shall be stored in cool, dry, well-ventilated locations. Exposure of laboratory chemicals to heat or direct sunlight shall be avoided.

Larger capacity containers of chemicals shall be stored on lower shelves.

The use of laboratory hoods as permanent storage devices is not permitted. The storage of items in a hood interferes with the proper airflow through the hood.

Where cabinets under a hood are used for the storage of chemicals, venting of the cabinet to the fume hood is desirable.

Metal containers involved in the transfer of one gallon or more of a flammable or combustible liquid shall be grounded and bonded to minimize the potential for ignition of the liquid by a discharge of static electricity.

Flammable materials shall not be stored with water reactive, explosive, or self-igniting materials or next to strong oxidizing agents.

Flammable liquids shall not be stored in a refrigerator that is not designated as being safe for that type of storage.

Flammable liquids shall be stored in vented flammable and combustible liquid storage cabinets.

Oxidizing materials such as nitrates and chlorates shall be stored in a cool dry place. Oxidizing materials shall be kept separate from organic materials. Appendix G. provides a "Hazardous Waste Storage Incompatibility Chart".

Examples of chemicals that form peroxides on storage is provided in Appendix E. Ethyl ether, isopropyl ether, and tetrahydrofuran shall be consumed within ninety days of the receipt of the chemical.

All peroxidizable compounds should be stored away from heat and light.

All peroxidizable compounds should be protected from physical damage and ignition sources.

In general, a peroxidizable material should be stored at the lowest possible temperature that is consistent with its freezing temperature. Do not store a peroxidizable material below the temperature at which peroxides may freeze or precipitate.

Do not open any container of a liquid organic compound that has obvious crystal formation around the lid.

Never use a metal spatula with peroxidizable materials.

When distilling a peroxidizable chemical, leave a residue of at least 10% in the bottom of the container. Most accidents occur when there is nearly dry residue in the container.

Use a shield in any distillation or evaporation involving a peroxidizable chemical.

Chemical reagents shall be kept in closed containers when not in use.

Each Laboratory Supervisor shall conduct periodic inventories of the chemicals that are stored in the laboratory. Chemicals that are no longer in use, shall be returned to the appropriate stockroom or given to the Hazardous Waste Disposal Coordinator.

Section IV. Laboratory Work Practices

Do not leave open bottles and beakers containing volatile materials outside of fume hoods.

Do not use chemicals from unlabeled or illegibly labeled containers without verifying the contents.

All pipetting shall be performed with bulbs or hand siphon pumps. Mouth suctioning of pipettes is not permitted.

Dewar flasks and other evacuated equipment shall be treated with extra care.

Dewar flasks and other evacuated equipment should be shielded or wrapped to contain glass fragments in the event of a rupture.

Air shall not be allowed to return to vacuum distillation equipment until the equipment has cooled.

The tubing in unattended water, gas, and vacuum lines shall be secured with a hose clamp or wire.

When heating a glass container with an open flame, always use wire gauze to spread the flame and distribute the heat. Always support the glass container independently of the wire gauze and ring. When heating a test tube, it should be tilted and heated along the sides of the test tube as well as the bottom of the test tube.

Whenever possible, use a heating mantle with a ring stand. A heating mantle with a metal shield shall be grounded.

Handle and store laboratory glassware with care. Damaged glassware shall not be used.

Never use burners or other ignition sources around flammable materials.

If electrically driven stirrers are used with flammable liquids, the motors shall be rated as intrinsically safe.

If a hot plate is used, ensure that its temperature is less than the auto ignition temperature of the flammable material likely to be released and the temperature control device does not spark.

Always dilute a concentrated acid with water by pouring the acid slowly into the water while agitating the mixture. If an exothermic reaction is expected, perform the dilution in an ice bath.

When pouring concentrated acids or bases, keep the opening of the receiving vessel pointed away from your face.

All containers of concentrated acids or bases shall be transported in rubber buckets or other secondary containers to minimize the chance for container breakage.

Prior to opening any pressurized bottle, cover the bottle with a towel.

Insulated gloves shall be used when handling dry ice or liquid nitrogen.

When the potential exists for a dangerous exothermic reaction, as in some distillations, continuously monitor the temperature of the liquid.

Do not leave an ongoing hazardous operation unattended without notifying your Laboratory Supervisor. The Laboratory Supervisor will review the work procedure for the safe completion of the operation. An appropriate sign will be posted at all entrances to the laboratory. The sign shall indicate the type of operation, a hazard warning, and the times that the operation is being left unattended. Precautions shall be made for the interruption of utility service during unattended operations (loss of water pressure, electricity, etc.).

Ovens that are not vented to a laboratory fume hood or to the outdoors shall not be used for evaporation.

Ovens with exposed heating elements shall not be used for storage or evaporation of flammable materials.

If a tabletop centrifuge is used, it shall be anchored securely in a location where its vibration will not cause bottles or equipment to fall. The following rules apply to the safe operation of centrifuges:

Always close the centrifuge during operation.

Do not leave the centrifuge until the full operation speed of the centrifuge has been attained.

If vibration occurs, stop the centrifuge immediately and check the load balance.

Check swing buckets for clearance and support

Clean rotors and buckets regularly with a non-corrosive cleaning solution.

A lubricant shall be used when threading glass tubing through a cork or rubber stopper.

When cutting glass tubing, the cut ends shall be fire polished to prevent cuts.

When dealing with broken glass, puncture resistant gloves shall be worn to minimize cuts.

Section V. Laboratory Ventilation

A laboratory fume hood shall be used when working with any material that might release Hazardous Chemical vapors, fumes, smoke, or dust. As a rule of thumb, at a minimum, use a fume hood when handling a chemical with an OSHA Permissible Exposure Limit (PEL) or American Conference of Governmental Industrial Hygienist (ACGIH) Threshold Limit Value (TLV) of 200 parts per million (ppm) or less.

If a Laboratory Worker who is using a fume hood believes that the fume hood is not operating properly, then he/she shall notify the Laboratory Supervisor and/or the CHO immediately at 913-523-3626 or cspringe@sju.edu.

Laboratory Workers shall operate the fume hoods at or below their designated sash heights.

A laboratory hood sash shall be kept in the down or closed position when the hood is not in use. To benefit from its barrier capability, the hood sash should be kept as low as practicable during the use of the hood.

Equipment in the fume hoods shall be kept to a minimum to avoid the blockage of airflow or hood face turbulence effects.

In the event of a power failure or other hood failure indicated by a hood alarm or otherwise, the Laboratory Supervisor shall instruct the Laboratory Workers on the necessary steps to take to safely terminate the experiment or procedure.

If a hood failure has occurred please contact either the CHO, Director of EH&S, or SJU Facilities Management (x3000) immediately so that the hood may be repaired in a timely manner.

Section VI. Compressed Gases

A compressed gas cylinder shall always be secured in an upright position with a chain or strap.

A compressed gas cylinder shall be stored in a cool, dry, ventilated area.

Always use a cylinder cart to move a compressed gas cylinder. A compressed gas cylinder shall never be moved without the protective cap in place.

Do not open a compressed gas cylinder until the correct regulator is in place.

After a new compressed gas cylinder is connected, and at any other time when the regulator or conducting tubing is manipulated, the potential leak points in the system shall be tested via a method such as using a soap solution.

When operating a cylinder regulator, the Laboratory Worker should always stand to the side to avoid injury in the event of the failure of the pressure gauge.

Do not use an oxygen regulator for any other gas or vice versa. Do not interchange a combustible gas regulator with a regulator that is used for an oil-free inert gas.

Only a manufacturer shall perform modification, alteration, and/or repair of a gas regulator. Never attempt to modify a regulator for a gas cylinder to force a fit.

To avoid possible formation of an explosive air/gas mixture, do not completely empty a compressed gas cylinder.

When a cylinder is empty, label it as such.

Empty compressed gas cylinders shall be stored separately from full compressed gas cylinders.

Section VII. Accidents

In the event of a medical emergency, contact Security at 1111 (they will call 911), your Laboratory Supervisor, and CHO. Emergency oxygen equipment is available at the nurse's station in Sourin Hall. If a person is experiencing distress in breathing or is evidencing possible shock symptoms (such as rapid, shallow breathing), call Security for evacuation of the person to Lankenau Hospital or dial 911.

Each Laboratory Worker is responsible for knowing the location and proper operation of emergency equipment that is maintained in the Science Center for spills, fires, and accidents.

All Laboratory accidents involving even minor personal injury shall be reported immediately to the Laboratory Supervisor and the CHO.

In the event of an exposure to a chemical, the SDS for the chemical and your Laboratory Supervisor shall be consulted for appropriate first aid measures.

Laboratory personnel shall have ready access to first aid equipment in each laboratory and in each stockroom for the treatment of minor injuries.

When eye contact with a Hazardous Chemical has occurred, flush the eyes for 15 minutes using the nearest laboratory eyewash fountain, immediately and simultaneously notify your Laboratory Supervisor.

When skin contact with a hazardous liquid chemical has occurred, immediately flush the affected area with copious amounts of water, remove any chemically contaminated clothing, and notify your Laboratory Supervisor.

When skin contact with a hazardous dry chemical has occurred, immediately brush as much of the dry chemical as possible off your clothes and body. Then wash your face and hands with a copious amount of water, then with soap and water, and notify your Laboratory Supervisor.

Section VIII. Safety Equipment, Housekeeping, & Maintenance

A listing of emergency telephone numbers of personnel and supervisors shall be posted on the inside of each laboratory door. A listing of the location of laboratory safety equipment shall be located in each laboratory.

Safety showers, eyewash fountains, fire extinguishers, and emergency alarms and telephones shall be accessible to all laboratory personnel.

Safety showers shall be activated quarterly and eyewash fountains shall be activated weekly by each Laboratory Supervisor (or designee) to flush the lines and verify their operation.

Section IX. Laboratory Inspections

Saint Joseph's University is committed to maintaining laboratory safety for both faculty and students. In support of this commitment and in order to comply with applicable local, state and federal safety requirements and best practices, the University's laboratories will be inspected at least once every three years, according to a prescribed schedule set forth below. The Chemical Hygiene Officer shall have primary responsibility on behalf of the University for seeking to ensure the University's compliance with applicable regulations and the successful implementation of best practices in the University's laboratories. Due to the large number of annual laboratory inspections, the participation of the natural sciences faculty, with the University's Director of EH&S, and the Chemical Hygiene Officer, in the periodic inspections of their department's laboratories, is required.

Inspection Team: Chairpersons will identify faculty from their departments who will participate in laboratory inspections. The faculty members so identified will be trained by the Chemical Hygiene Officer regarding the steps involved in conducting

an effective laboratory inspection. If these faculty members, after a careful and thorough laboratory inspection that is consistent with the training provided, requirements set forth and best practices presented, certifies a laboratory as in compliance with the University's safety requirements and best practice guidelines received from the Chemical Hygiene Officer and if, subsequently, an accident occurs in the laboratory, the University will defend and indemnify such faculty member in connection with any legal actions asserted against the faculty member so long as the faculty member was acting within the course and scope for the faculty member's University employment at the time of the accident. *Limitation of Liability and Indemnification of Agent* form is attached as Appendix H.

Time commitment: Faculty members in the biology, chemistry, and physics departments, as identified by their department chairs, will conduct self-inspections of their department's laboratories according to the prescribed schedule set forth below. In the event that any faculty member conducts and documents appropriate laboratory inspections involving 12 or more hours of work in an academic year, the Dean will regard and acknowledge this work as equivalent to service on a major college or university committee (e.g., Executive Committee of College Council or University Council) in the Dean's evaluation of the faculty member, such as in an annual faculty evaluation or an application for tenure or promotion.

The "prescribed schedule" for **2015 (calendar year)** is as follows:

The Biology Department will inspect labs 102, 105, 106, 107B, 110, 111, 111A, 201A, 201B, 202, 203, 205, 205A, 205C, 206, 207, 208, 209, 210, 211, 212, 214, 215, 216, 217, 218, and 313.

The University's Director of EH&S and the Chemical Hygiene Officer will inspect labs 104, 301, 304, 309, 310, 311, 312A, 312B, 314A, 314B, 315A, 315B, 318, 401, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 414A, and 434.

The "prescribed schedule" for **each subsequent calendar year**) is to be determined by the Chemical Hygiene Officer and the Director of Health and Safety and Environmental Compliance in January of each year. Prescribed Schedule will be posted in the Labs.

In addition to the inspection of safety equipment, each Laboratory Supervisor shall conduct general housekeeping and chemical hygiene inspections on a regular basis.

Each Laboratory Supervisor shall communicate to all personnel the written emergency plan that includes procedures for ventilation failure, evacuations, medical care, incident reporting, and emergency drills.

Laboratory aisles and bench tops shall be kept as free as possible of accumulations of unnecessary equipment, chemicals, and other items. Good housekeeping is a critical item in preventing laboratory accidents.

Malfunctioning laboratory equipment shall be labeled or tagged “out of service” and shall not be used until repairs have been performed.

Laboratory personnel shall not allow access to laboratory safety equipment, stairways, hallways, or exits to be blocked by chemicals, equipment, or other obstructions.

Section X. Chemical Procurement and Distribution

When ordering a Hazardous Chemical, the purchase order shall include a request for the latest SDS.

Upon arrival of a Hazardous Chemical, the appropriate SDS shall be provided. If the SDS is not available, the manufacturer or distributor shall be contacted immediately. If necessary, a SDS request form can be sent to the manufacturer or distributor. Appendix F. contains an example of a form that can be used to request a SDS. If the SDS cannot be obtained for a Hazardous Chemical, then provisions shall be made for the return of the Hazardous Chemical to the manufacturer or distributor.

The laboratory shall not accept delivery of an inadequately labeled Hazardous Chemical which is not in accordance with the Global Harmonization System.

A label shall contain the following six elements:

- Product Identifier
- Signal Word (Danger or Warning)
- Hazard Statement
- Pictogram
- Precautionary Statement, and
- Name, address and phone number of the manufacturer or supplier.

When a manufacturer or distributor has shipped a Hazardous Chemical without an adequate label, then provisions shall be made for the return of the Hazardous Chemical back to the manufacturer or distributor.

A worn or faded label shall be replaced immediately.

If a container is received with a chemical leaking from it, extreme caution shall be exercised until the chemical is identified and proper clean up measures have been determined. If the chemical poses a significant hazard or an unknown hazard, the Laboratory Supervisor shall call an approved contractor that specializes in Hazardous Chemical spill responses.

If a Laboratory Supervisor synthesizes a Hazardous Chemical and plans to ship it off campus, the following must be done:

The Hazardous Chemical must be labeled with the following information: (1) the identity of the Hazardous Chemical, (2) the appropriate hazard warnings, and (3) the name and campus address of the person at Saint Joseph's University who is responsible for the shipping of the Hazardous Chemical in accordance with the Hazardous Materials Transportation Act {U.S.C. 1801 et seq.}

A Safety Data Sheet must be developed and sent with the shipment

Section XI. Waste Disposal Program

Hoods shall not be used for the disposal of volatile chemicals

A drain shall not be used for the disposal of a Hazardous Chemical unless the chemical has been deactivated or neutralized and the resulting chemical is allowed by local regulation in the sanitary sewer system.

Ordinary waste paper shall be placed in a wastepaper basket that is separate from the Hazardous Chemical waste. If a piece of paper is contaminated with a Hazardous Chemical, such as a paper towel that has been used to clean up a spill, then the contaminated piece of paper shall be placed in a special container that is marked for this use.

Laboratory waste shall be disposed of in a timely manner.

Each laboratory that generates Hazardous Chemical waste must designate a Satellite Accumulation Area (SAA). The area must be labeled as an SAA point of generation. The Hazardous Chemical waste in this area must be placed in secondary containment that is capable of holding 110% of the total volume in storage, or 100% of the largest container, whichever is greater.

Each hazardous waste container within the SAA must be closed to prevent volatilization, and properly labeled. The label must include the following information: (1) the words "Hazardous Waste", (2) a list of chemicals that are in the container and the approximate percentage of each chemical that is on the container, (3) the hazards of the waste (e.g., "flammable", "combustible", "corrosive", "reactive", "oxidizer", "organic peroxide", and "carcinogen"), and (4) the date that the accumulation of hazardous waste was started in that container.

Only one container per waste stream is allowed in each SAA. The container may remain in the SAA for as long as it takes for the container to be filled. When the container is full, "Full Date" must be completed on the label. A full container must be removed from the SAA within 72 business hours. The Hazardous Waste Disposal Coordinator shall be contacted to arrange for the removal.

The Hazardous Waste Disposal Coordinator shall accumulate the hazardous waste materials in Room 104A of the Science Center or in the other designated storage area(s) and shall dispose of these materials in a manner that is consistent with applicable regulations. A hazardous waste manifest shall be filled out by the Hazardous Waste Disposal Coordinator and a copy of the manifest shall be maintained by the Hazardous Waste Disposal Coordinator.

If there is a spill or rupture of a hazardous waste container, then:

Everyone shall evacuate the area.
Security shall be notified immediately at 1111.

The Director of EH&S and the CHO shall be notified immediately.

The area shall be secured so as to prevent any other individual from being exposed to the spill hazard

Section XII. Exposure Monitoring

All chemicals in the laboratories have an associated Safety Data Sheet (SDS). Each SDS describes an acceptable OSHA or NIOSH inhalation exposure to that chemical for an 8 hour time weighted average (TWA) exposure. Any chemical exposure monitoring will be conducted in accordance with either NIOSHA or OSHA methods which are defined in the NIOSH Guide to Chemical Hazards. Additional information in Appendix D.

A Laboratory Worker shall be notified of the results of the monitoring within 15 days of the receipt of the monitoring results or as is required by the specific regulation.

Section XIII. Control Measure Implementation

A fume hood shall be used in the laboratory when:

- Handling a chemical with a significant inhalation hazard
- Performing a procedure that may lead to splattering
- Carrying out an operation where a component failure may release a Hazardous Chemical with velocity
- Carrying out a reaction that is strongly exothermic
- Handling a Hazardous Chemical with a significant vapor pressure

- Recommended by the Laboratory Supervisor or the Chemical Hygiene Officer
- When the fume hood alarm system has indicated a failure in the safe functioning (i.e. velocity) of a fume hood.

Every laboratory ventilation hood that is used for the control of air contaminants shall be tested on an annual basis to assure that adequate air velocities and volumes are being maintained. The vendor (hired by Facilities Management) shall also mark the operable sash height for maintaining the minimum face velocity for safe use.

Laboratory fume hood testing shall consist of face velocity measurements taken at the front opening of the hood.

A laboratory fume hood shall be considered acceptable when the average face velocity equals or exceeds 80 feet per minute for materials of low to moderate hazard and 150 feet per minute for materials of high hazard. This velocity may be measured at the full open sash position or if the sash is provided with sash locks, at the fixed operating position of the sash.

When the results of a hood testing indicate a decline or failure of the average face velocity of less than 80 feet per minute for materials of low to moderate hazard and less than 150 feet per minute for materials of high hazard, the hood shall be removed from service until repairs can be completed. A sign shall be posted indicating that the hood is "Out of Service".

Hoods other than fume hoods, such as instrument vents, shall also be tested on an annual basis for adequate airflow. For these hoods, face velocity measurements or hood static pressure measurements may be used to satisfy this requirement.

Section XIV. Personal Protective Equipment

Laboratory coats, aprons, and protective sleeves or long sleeved shirts shall be worn in the laboratory when:

- Dermal exposure to a Hazardous Chemical is likely
- When performing a task on a work surface or equipment that may be contaminated:
 - With a Hazardous Chemical
 - A strongly exothermic reaction may occur
 - Working on a procedure where spattering is possible
 - Carrying out an operation where a component failure may release a Hazardous Chemical with velocity
 - Recommended by the Laboratory Supervisor or Chemical Hygiene Officer

A laboratory coat and/or clothing that becomes wetted or soaked with Hazardous Chemicals shall be removed and replaced promptly. The removed laboratory coat and/or clothing shall be disposed of as hazardous waste or decontaminated properly so that it is then considered non-hazardous.

Aprons shall be inspected prior to each use for holes, punctures, or tears, etc. They shall be replaced as needed.

Chemical goggles or face shields shall be worn in the laboratory when:

- Working with corrosive or highly irritating chemicals
- Working on a procedure where spattering is possible
- Carrying out an operation where a component failure may release a hazardous
- Conducting a vacuum or pressure operation utilizing glassware
- Refluxing or distilling a flammable or otherwise Hazardous Chemical with velocity
- Transferring mixing, or stirring hot, corrosive, or toxic liquids in open containers
- Recommended by the Laboratory Supervisor or Chemical Hygiene Officer
- Gloves shall be used in the laboratory when:
 - Handling a corrosive or highly irritating chemical
 - Performing a procedure where spattering is possible
 - Carrying out an operation where a component failure may release a Hazardous Chemical with velocity
 - Dermal exposure to a Hazardous Chemical is likely
 - Performing a task on a work surface or equipment that may be contaminated with a Hazardous Chemical
 - Cleaning up the spill of a Hazardous Chemical
 - Recommended by the Laboratory Supervisor or Chemical Hygiene Officer
- Gloves shall be inspected prior to each use for holes, punctures, or tears, etc. They shall be cleaned after each use and replaced as needed.

- Disposable gloves shall be discarded immediately after use to prevent the spread of chemicals to telephones, doorknobs, lab notebooks, etc.
- Once disposable gloves are worn in the laboratory, they never should be worn outside of the laboratory.

Section XV. Special Provisions for Particularly Hazardous Substances

Each laboratory should prepare a list of those materials for which special provisions will be applied; The OSHA Laboratory Standard suggests that these materials should include reproductive toxins, highly (acutely) toxic materials, and selected carcinogens. These materials should be identified specifically by each Laboratory Supervisor in consultation with the Chemical Hygiene Officer. The OSHA Laboratory Standard indicates that specific consideration should be given to “(a) establishment of a designated area; (b) contaminated devices such as fume hoods or glove boxes; (c) procedures for safe removal of contaminated waste; and (d) decontamination procedures.” The review should include the conditions of handling, skin exposure potential, inhalation hazard, use of personal protective equipment, continuous air monitors, alarms, and the need for contamination control devices. Disposal of these substances should be addressed by reference to environmental standards for the disposal of such wastes. The entire group of special provisions should be reviewed prior to implementation.

The OSHA Laboratory Standard has mandated that a special review shall be conducted in any laboratory in which a “particularly hazardous substances” is being used in order to determine if the hazard potential warrants implementation of special controls or procedures to control the exposure of Laboratory Workers.

There is some flexibility in developing the criteria to be used in determining whether a particular chemical falls into the category of a special hazard chemical. The following chemicals shall be considered for special controls or procedures:

- Any chemical designated as highly toxic by oral, dermal, or inhalation routes of exposure as defined in the OSHA Hazard Communication Standard
- Any chemical that is an OSHA regulated carcinogen
- Any chemical that is listed by the National Toxicology Program (NTP) as “Known To Be Carcinogenic”
- Any chemical listed by NTP as “Reasonably Anticipated to be Carcinogenic”

- Any chemical listed as a Group 1 carcinogen by the International Agency for Research on Cancer (IARC)
- Any chemical listed as a 2A or 2B carcinogen by IARC
- Any chemical designated as “Known to Cause Reproductive Toxicity” according to the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Proposition 65)
- Other chemicals that have been shown through laboratory experience to present significant or special hazards during laboratory processing activities
- For mixtures where there is no information indicating that the mixture would pose the risk of an individual substance, the special evaluation requirements may be waived in those instances where the mixture contains less than 1 percent by weight of Highly Toxic Chemicals and less than 0.1 percent by weight of suspect carcinogens and reproductive hazards.

Each Laboratory Supervisor in consultation with the Chemical Hygiene Officer is responsible for identifying a chemical that meets the criteria for being a special hazard.

When a special hazard chemical has been identified, the Chemical Hygiene Officer is responsible for organizing a review to assess the overall hazard potential of the laboratory’s use of the special hazard chemical and proving recommendations if special control measures are deemed necessary.

Section XVI. Health Hazards Information, Training, & Identification

The Chemical Hygiene Officer maintains a Hazard Communication Program to provide the Laboratory Supervisors and Laboratory Workers with health hazard information, training, and to both label materials appropriately and inform employees about the meaning of the labels. As a part of this program, the laboratory maintains on-line safety data sheets (SDS), which are also located in the Biology Stockroom (Room 205), the Chemistry Stockroom (Room 404), and the Physics Office (Room 313).

The Chemical Hygiene Plan includes the following basic elements:

- The Chemical Hygiene Officer shall inform the Laboratory Supervisors and the Laboratory Workers, both at the time of employment and prior to job assignments involving new exposure situations, of the nature of the hazards of chemicals and physical agents in their work areas.

The Chemical Hygiene Officer provides information and training to Laboratory Supervisors and Laboratory Workers on:

- The content of the OSHA Laboratory Standard and its appendices
- The location and availability of the Chemical Hygiene Plan
- The permissible exposure limits (PELs) or threshold limit values (TLVs) for materials that are handled in the laboratory
- The signs and symptoms associated with exposure to Hazardous Chemicals that are used in the laboratory
- The location and availability of safety and health references including Material Safety Data Sheets
- The methods available to detect the release of a Hazardous Chemical in the laboratory
- The physical and health hazards of chemicals in the laboratory
- The measures Laboratory Supervisors and Laboratory Workers can take to protect themselves from laboratory chemical hazards including standard
- Operating procedures, personal protective equipment, and engineering controls

The training program shall address the location and proper use of laboratory equipment, including personal protective equipment, respiratory protection (if required), laboratory safety equipment, and emergency procedures.

Each Laboratory Supervisor in consultation with the Chemical Hygiene Officer shall determine the appropriate frequency of refresher information and training.

Each academic apartment shall maintain the following information so that it is readily available to the Laboratory Supervisors and Laboratory Workers:

- A copy of the Chemical Hygiene Plan
- The laboratory standard operating procedures
- A laboratory chemical inventory listing all Hazardous Chemicals that are present in the laboratories of that department
- A listing of laboratory safety reference sources

- A summary of the requirements of the OSHA Laboratory standard (OSHA 1910.1450)
- A listing of the special hazard materials handled in the laboratories of that department
- Safety Data Sheets for all of the chemicals in the laboratories of that department
- Laboratory spill clean up procedures

The Chemical Hygiene Officer shall maintain the following information so that it is readily accessible to Laboratory Supervisors and Laboratory Workers:

- A laboratory specific standard operating procedures
- A laboratory chemical inventory listing all of Hazardous Chemicals that are present in each laboratory
- A listing of the special hazard chemicals that are handled in each laboratory
- Safety Data Sheets for all of the Hazardous Chemicals in each laboratory
- Laboratory spill clean up procedures for all Hazardous Chemicals that are present in each laboratory

Every employee has the right to access this information and is encouraged to do so. This information can be accessed by contacting the Chemical Hygiene Officer.

New Laboratory Supervisors and Laboratory Workers shall have a training session in which the information in this section is reviewed, the hazards of the chemicals and procedures with which they will be working are explained, and proper laboratory practices are outlined. This review session shall occur prior to chemical handling in the laboratory.

Section XVII. Pre-Operational Evaluation & Consultation

The OSHA Laboratory Standard states that the Chemical Hygiene Plan shall include specific measures regarding “the circumstances under which a particular laboratory operation, procedure, or activity shall require prior approval from the employer or the employer’s designee before implementation.”

Certain laboratory operations identified by the laboratory supervisor are of special concern in laboratory supervision because of the potential hazards associated with those operations. Activities such as the use of acutely toxic chemicals or radioactivity as some examples (not exhaustive) should qualify in this situation. In those instances, in order to assure that safeguards are properly set up and that personnel are adequately trained in the procedure, laboratory personnel are instructed to obtain prior approval from the Chemical Hygiene Officer prior to commencing the operation. This prior approval requirement means that approval must be obtained each time that the operation is conducted.

Section XVIII. Provisions for Medical Consultation and Medical Examinations

Each Laboratory Supervisor shall provide each Laboratory Worker in his/her laboratory with the opportunity to receive medical attention, including any follow-up examinations that the examining physician determines to be necessary, under the follow circumstances:

- Whenever a Laboratory Worker develops signs or symptoms associated with a Hazardous Chemical to which the Laboratory Worker may have been exposed in the laboratory
- When a Laboratory Worker is exposed at or above the action level (or, if none, the PEL) to an OSHA regulated substance for which specific medical surveillance requirements exist
- Whenever an event takes place in the laboratory such as a spill, leak, or explosion that results in the potential exposure of a Laboratory Worker to a Hazardous Chemical

Medical examinations and consultations shall be done by or under the direct supervision of a licensed physician at Lankenau Hospital at no cost to the Laboratory Worker, at a reasonable time, and without loss of pay.

Where medical examinations or consultations are provided, the examining physician shall be provided with the following information:

- The identity of the Hazardous Chemical(s) to which the Laboratory Worker may have been exposed
- A description of the conditions under which the exposure occurred, including quantitative exposure data if it is available
- A description of the signs and symptoms of exposure that the Laboratory Worker is experiencing

For examinations or consultations provided to a Laboratory Worker, a written opinion from the examining physician shall be obtained by the Benefits Coordinator in Human Resources and the Chemical Hygiene Officer. It shall include:

- Results of the medical examination and associated tests
- Any medical condition that is revealed which places the Laboratory Worker at an increased risk of exposure to a Hazardous Chemical that is present in the laboratory
- Recommendations for further medical follow-up. Note: Applicable regulations regarding medical privacy in this context are attached.
- A statement that the employee has been informed of the results of the medical examination or consultation
- Records regarding the medical consultations and examinations shall be maintained in the Human Resources Department.

Section XIX. Chemical Hygiene Plan Review

Each Laboratory Supervisor and the Chemical Hygiene Officer are responsible for conducting an annual review of the laboratory's Chemical Hygiene Plan and confirming that the following is correct:

- The chemical inventory is being kept current.
- The Chemical Hygiene Officer is being notified when new special hazard chemicals are introduced in the laboratory.
- Labels on incoming chemicals are not being removed or defaced.
- All information in the Chemical Hygiene Plan is being kept current, including contact names and laboratory safety rules.
- Performance testing of each laboratory ventilation system is being performed and documented and timely corrective action is being taken where fume hoods are shown to be performing below the standard.

- Annual training is being conducted and documented for all of the personnel who work in the laboratory.
- Standard operating procedures established for handling Hazardous Chemicals are being followed.
- The Chemical Hygiene Officer will provide an annual report concerning the status of the laboratory Chemical Hygiene Plan that addresses the items noted above.

Section XX. Appendices

Appendix A. Relevant Personnel

Position	Contact	Phone	Email
Director HSE	Tim Travers	Office: 610 660 3037 Cell: 610 517 0037	ttravers@sju.edu
University Chemical Hygiene Officer	Clint Springer	Office: 610-660-3432 Cell: 913-523-3626	cspringe@sju.edu
Hazardous Waste Disposal Coordinator	Clint Springer	Office: 610-660-3432 Cell: 913-523-3626	cspringe@sju.edu
Radiation Safety Officer	Julia Lee-Soety	Office: 610-660-3439	jlee04@sju.edu
Environmental Emergency Response Coordinator	Rex Miller	Office: 484-250-5900	
Spill Response Contractor	HEPACO	800 888 7689	

Appendix B. SCIENCE CENTER EVACUATION PLAN

In the event of a fire, chemical spill, or other emergency, the evacuation of the Science Center should proceed as follows:

IF YOU ARE RESPONSIBLE FOR THE INCIDENT, you should alert all of the people in that room to exit the room immediately, and you should instruct them to meet at the Chapel. The last person out of the room should close all of the entry doors. As soon as possible, you should activate the fire alarm, then call 911 (identify the location of the incident), and then call SJU Public Safety at X1111 (identify the location of the incident). You should proceed immediately to the Chapel and report to an SJU Security representative. You should remain at the Chapel until an SJU Security representative informs you that it is safe to return to the Science Center.

EVACUATION OF CLASSROOMS AND TEACHING LABS:

1. When the emergency alarm sounds, the person in charge of the classroom or teaching lab should visually inspect the adjacent hallways and determine if any exit route is obstructed by fire, smoke, debris, etc. The person in charge should then instruct all of the occupants of that room to leave the room by an unobstructed exit door and to meet at the Chapel.
2. The person in charge should be the last one to leave the room. He/she should make sure that all of the entry doors to the room are closed. The person in charge then should proceed to the Chapel.
3. You should remain at the Chapel until an SJU Security representative informs you that it is safe to return to the Science Center.
4. In the event that all of the exits from a classroom or teaching lab are blocked by fire, smoke, debris, etc. so that no exit is possible, then all of the doors to that room should be closed, and the person in charge should call both 911 and SJU Public Safety at X1111 and report that they are trapped. Each dispatcher must be informed of the location of the room and the number of people who are present. If possible, wet cloths should be placed along the bottom of each exit door.

EVACUATION OF RESEARCH LABS:

1. When the emergency alarm sounds, someone in the research lab should visually inspect the adjacent hallways and determine if any exit route is obstructed by fire, smoke, debris, etc.
2. If hazardous materials or dangerous equipment is in use when the emergency alarm sounds, then steps should be taken as quickly as possible to make the area safe. For example, a bunsen burner in use should be turned off. However, no one should spend any unnecessary time in the lab.
3. The last person to leave the room should close all of the entry doors.
4. Everyone should proceed to the Chapel.
5. At the Chapel, an SJU Security representative should be informed of hazardous materials and any other relevant dangers that are present in that research lab.

6. You should remain at the Chapel until an SJU Security representative informs you that it is safe to return to the Science Center.

7. In the event that all of the exits from the research lab are blocked by fire, smoke, debris, etc. so that no exit is possible, then all of the doors to the room should be closed, and someone should call both 911 and SJU Public Safety at X1111 and report that they are trapped. Each dispatcher must be informed of the location of the room and the number of people who are present. If possible, wet cloths should be placed along the bottom of each exit door.

EVACUATION OF OFFICES:

1. When the emergency alarm sounds, someone in the office should visually inspect the adjacent hallways and determine if any exit route is obstructed by fire, smoke, debris, etc.

2. Everyone should leave the room by an unobstructed exit door and meet at the Chapel. The last person to leave the office should make sure that all of the entry doors to the office are closed.

3. You should remain at the Chapel until an SJU Security representative informs you that it is safe to return to the Science Center.

4. In the event that all of the exits from the office are blocked by fire, smoke, debris, etc. so that no exit is possible, then all of the doors to the office should be closed, and someone should call both 911 and SJU Public Safety at X1111 and report that they are trapped. Each dispatcher must be informed of the location of the room and the number of people who are present. If possible, wet cloths should be placed along the bottom of each exit door.

EVACUATION OF A DISABLED PERSON:

An individual who uses a wheel chair or is otherwise unable to descend stairs should proceed immediately to the nearest exit if he/she is on the ground floor, or to the nearest set of fire stairs. If unable to descend the stairs, a person with a disability should wait calmly on a fire stair landing, preferably with an able-bodied evacuee. Another able-bodied evacuee must immediately notify emergency personnel of the exact location of the disabled person and his/her companion.

Appendix C. Highly Toxic Chemicals posing a special hazard during clean up

anisidine (ortho and para isomers)
antimony (and its compounds)
arsenic (and its compounds)
benzene
benzidine
benzoquinone
biphenyl
boron trifluoride
cadmium (and its compounds)
carbon tetrachloride
chloroform
chromium (VI) compounds
cyanides
dicyclopentadiene
dimethyl sulfate
dinitrobenzene (all isomers)
ethylene chlorohydrin
ethylene oxide
hexachlorobutadiene
hexamethylphosphoramide (HMPA)
hydrazine
hydrofluoric acid
hydrogen sulfide
iron pentacarbonyl
lead (and its compounds)
maleic anhydride
mercury (and its compounds)
N-methylaniline
2-naphthylamine
2-nitropropane
nitric oxide
pentachlorophenol
phenylhydrazine
phosphorus
platinum (soluble salts)
rhodium (soluble salts)
selenium (and its compounds)
thallium (and its compounds)
sodium azide
thionyl chloride
ortho-toluidine
para-toluidine
uranium
vanadium pentoxide
vinyl bromide
zirconium (and its compounds)

Appendix D. Definitions

Action Level: a chemical concentration designated by OSHA, calculated as an eight-hour time-weighted average, which initiates exposure monitoring and medical surveillance. One Reference: 29 CFR 1910

Chemical Hygiene Officer: designated by the employer, and who is qualified by training or experience to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan.

Chemical Hygiene Plan: 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 Laboratory Workers from the health hazards presented by Hazardous Chemicals used in that particular workplace and which meets the requirements of 29 CFR 1910.1450.

Flashpoint: the minimum temperature at which a liquid gives off sufficient flammable vapors to ignite.

NIOSH: National Institute of Occupational Safety and Health

OSHA: Occupational Safety and Health Administration

Permissible Exposure Limits (PELs): TWA concentrations prescribed by OSHA that must not be exceeded during any 8-hour work shift of a 40-hour work week.

Hazardous Chemical:

The Laboratory Standard defines a hazardous chemical as any element, chemical compound, or mixture of elements and/or compounds which is a physical or health hazard. A chemical is a physical hazard if there is scientifically valid evidence that it is a flammable, a combustible liquid, a compressed gas, an explosive, an organic peroxide, an oxidizer, pyrophoric, unstable material (reactive), or water-reactive. A chemical is a health hazard if 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. Included are:

carcinogens	sensitizers	hepatotoxins (liver)
irritants	radioactive material	nephrotoxins (kidney)
reproductive toxins	neurotoxins (nerve)	agents that act on the hematopoietic system (blood)
corrosives	biohazards	agents that damage the lungs, skin, eyes, or mucous membranes

In most cases, the label will indicate if the chemical is hazardous. Look for key words like caution, hazardous, toxic, dangerous, corrosive, irritant, carcinogen, etc. Older containers of hazardous chemicals (before 1985) may not contain hazard warnings. If you are not sure a chemical you are using is hazardous, review the Safety Data Sheet (SDS) or contact your supervisor, instructor, or the Department of Environmental Health and Safety.

Highly Toxic Chemicals: a chemical falling within any of the following categories:

A chemical that has a median lethal dose (LD50) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats each weighing between 200 and 300 grams

A chemical that has a median lethal dose (LD50) of milligrams or less per kilogram by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits each weighing between two and three kilograms

A chemical that has a median lethal concentration (LC50) in air of 200 parts per million by volume or less of gas or vapor or 2 milligrams per liter or less of mist, fume, or dust when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats each weighing between 200 and 300 grams

Appendices A and B of the Hazard Communication Standard (29 CFR 1910.1200) provide further guidance in defining the scope of health hazards and determining whether or not a chemical is to be considered hazardous for the purposes of this standard.

Laboratory: a facility where the “laboratory” uses of Hazardous Chemicals occurs. It is a workplace where relatively small quantities of Hazardous Chemicals are used in a non-production basis.

Laboratory Hood: a device located in a laboratory, enclosed on five sides with a moveable sash or fixed partial enclosure on the remaining side; constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air contaminants into the laboratory; and allows chemical manipulations to be conducted in the enclosure without insertion of any portion of the Laboratory Worker’s body other than hands and arms.

A walk-in-hood with an adjustable sash meets the above definition provided that the sash is adjusted during use so that the airflow and the exhaust of air contaminants are not compromised and a Laboratory Worker does not work inside the enclosure during the release of any airborne Hazardous Chemicals.

Peroxidizable: a material which reacts with oxygen to form peroxides which can explode with impact, heat, or friction (such as removing a lid). Since such chemical may be packaged in an atmosphere of air, peroxides can form even though the container has not yet been opened. Examples of peroxidizable chemicals include ethyl ether, tetrahydrofuran isopropyl ether, and olefins (alkenes).

Physical Hazard: a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compresses gas, an explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive), or water-reactive.

Appendix E. Peroxide Forming Compounds

acetal
butadiene
chlorobutadiene (chloroprene)
chlorotrifluoroethylene
cumene
cyclohexene
diacetylene
dicyclopentadiene
dioxane
divinyl acetylene
ethylene glycol dimethyl ether (glyme)
ethyl ether
isopropyl ether
methyl acetylene
methyl isobutyl ketone
methylcyclopentane
potassium metal
sodium amide
styrene
tetrafluoroethylene
tetrahydrofuran
tetrahydronaphthalene
vinyl ethers
vinyl acetate
vinyl acetylene
vinyl chloride
vinyl pyridine
vinylidene chloride

Appendix F. Sample Letter to Request an SDS

XYZ Chemical Manufacturer
1234 Street
Anytown, USA 11222

Dear Sir or Madam:

The Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200) requires that an employer be provided with a Safety Data Sheet (SDS) for each Hazardous Chemical that is used in their facility. The SDS must be made available to all employees who potentially may be exposed to this Hazardous Chemical.

Consequently, we request a copy of the SDS for your product _____. We did not receive an SDS with the initial shipment. We also request any additional information, supplemental SDS, or any other relevant data that your company or supplier has concerning the safety and health aspects of this product.

Please consider this letter as a standing request to your company for any information concerning the safety and health aspects of using this product that may become known in the future.

The SDS and any other relevant information should be sent to me within 10 days. A delay may prevent the use of your product and may force us to send it back to you. Please send the information to the address listed below.

Your cooperation is greatly appreciated. If you have any questions, please contact me by telephone at 610-660-XXXX or by e-mail at XXXXXX@sju.edu.

Sincerely,

Department of _____
Saint Joseph's University
5600 City Avenue
Philadelphia, PA 19131

The references below are from 29 CFR:

Medical consultation and medical examinations.

1910.1450(g)(1)

The employer 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:

1910.1450(g)(1)(i)

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.

1910.1450(g)(1)(ii)

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 particular standard.

1910.1450(g)(1)(iii)

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, the affected employee shall be provided an opportunity for a medical consultation. Such consultation shall be for the purpose of determining the need for a medical examination.

1910.1450(g)(2)

All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

1910.1450(g)(3)

Information provided to the physician. The employer shall provide the following information to the physician:

1910.1450(g)(3)(i)

The identity of the hazardous chemical(s) to which the employee may have been exposed;

1910.1450(g)(3)(ii)

A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and

1910.1450(g)(3)(iii)

A description of the signs and symptoms of exposure that the employee is experiencing, if any.

1910.1450(g)(4)

Physician's written opinion.

1910.1450(g)(4)(i)

For examination or consultation required under this standard, the employer shall obtain a written opinion from the examining physician which shall include the following:

1910.1450(g)(4)(i)(A)

Any recommendation for further medical follow-up;

1910.1450(g)(4)(i)(B)

The results of the medical examination and any associated tests;

1910.1450(g)(4)(i)(C)

Any medical condition which may be revealed in the course of the examination which may place the employee at increased risk as a result of exposure to a hazardous workplace; and

1910.1450(g)(4)(i)(D)

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.

1910.1450(g)(4)(ii)

The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

Appendix G. Storage Guidelines for Hazardous Chemicals

Hazardous Material/Hazardous Waste Storage Incompatibility Chart

Substances in bold have detailed example lists on the next page.

If the material contains:	It may not be stored with any of the following:
Acid (pH below 2.0)	Caustics (pH above 12.5) Reactive Metals Alcohol Water Aldehydes Halogenated, Nitrated, or Unsaturated Hydrocarbons Reactive Organic Compounds and Solvents Spent Cyanide and Sulfide Solutions Oxidizers
Caustic (pH above 12.5)	Acid (pH below 2.0) Reactive Metals Alcohol Water Aldehydes Halogenated, Nitrated, or Unsaturated Hydrocarbons Reactive Organic Compounds and Solvents
Reactive Metals	Caustics Acids Alcohol Aldehydes Halogenated, Nitrated, or Unsaturated Hydrocarbons Reactive Organic Compounds and Solvents Oxidizers
Reactive Organic Compounds and Solvents	Caustics Acids Reactive Metals
Spent Cyanide and Sulfide Solutions	Acids
Oxidizers	Acetic or Other Organic Acids Concentrated Mineral Acids Reactive Metals Reactive Organic Compounds and Solvents Ignitable [Flammable/Combustible] Wastes*

*"Ignitable" in this context refers to substances with a flashpoint below 140°F and includes:
Combustible substances, with a flashpoint below 140°F
Flammable substances, with a flashpoint below 100°F.

Some Deadly Combinations

Acids + Oil or Grease = Fire	Flammable Liquids + Hydrogen Peroxide = Fire/Explosion
Acids + Caustics = Heat/Spattering	Aluminum Powder + Ammonium Nitrate = Explosion
Caustics + Epoxies = Extreme Heat	Sodium Cyanide + Sulfuric Acid = Lethal Hydrogen Cyanide
Chlorine Gas + Acetylene = Explosion	Ammonia + Bleach = Noxious Fumes

APPENDIX H

***LIMITATION OF LIABILITY
AND INDEMNIFICATION OF AGENT***

THIS INDEMNITY AGREEMENT (the “**Agreement**”) is made as of the ____ day of _____, 2015, by SAINT JOSEPH’S UNIVERSITY, a Pennsylvania non-profit corporation (“**University**”), and _____ having an address of _____ (“**_____**”) (collectively, the “**Parties**”).

WHEREAS, the University seeks to utilize the services and expertise of _____ with respect to the implementation of and compliance with the University’s Chemical Hygiene Plan (“**CHP**”);

WHEREAS, the University has agreed that it will indemnify and hold harmless _____ with respect to his or her activities related to the audit and/or review of the University’s compliance with and implementation of the University’s CHP;

NOW THEREFORE, in furtherance of the University’s desire to provide such indemnity, and _____’s willingness to participate in a compliance and/or implementation review of the CHP, the Parties agree as follows:

Limitation of Liability.

For the purpose of this Agreement, “**Agent**” means any Person who is or was serving at the request of Saint Joseph’s University (the “**University**”) as a member of a Proceeding; “**Proceeding**” for the purposes of this Agreement means any administrative investigation with respect to performance and/or compliance by the University, and/or any employee, guest, student and/or worker of the University (individually a “**University Party**,” and collectively, the “**University Parties**”) with respect to compliance with University policies and protocols as established in the “**Chemical Hygiene Plan**,” a copy of which is attached here to as Exhibit A (the “**CHP**”); and “**Expenses**” include without limitation attorneys’ fees and any expenses of establishing a right to indemnification under this Agreement.

Subject to subsection (b) of this Agreement, Section 1, the Agents shall not be responsible or liable in any event for any act or omission of any other Agent.

No Agent, when acting in its respective capacity as such, shall be personally liable to any Person, for any act, omission or obligation of the University or any University Parties.

Each Agent shall, in the performance of his or her duties, be fully and completely justified and protected with regard to any act or any failure to act resulting from reliance in good faith upon the books of account or other records of the University, upon an opinion of counsel, or upon reports made to the University by any of the University Parties, accountants, appraisers or other experts or consultants selected with reasonable

care by the University and/or University Parties, regardless of whether such counsel or expert may also be a University Party.

The limitation on liability contained in this Agreement applies to events occurring at the time a Person serves as an Agent whether or not such Person is an Agent at the time of any Proceeding in which liability is asserted.

No amendment or repeal of this Agreement shall adversely affect any right or protection of an Agent that exists at the time of such amendment or repeal.

Indemnification.

Indemnification by the University. The University shall indemnify, any Agent against Expenses, judgments, fines, settlements and other amounts actually and reasonably incurred in connection with such Proceeding if such Person acted in good faith.

Other Contractual Rights. Nothing contained in this Agreement shall affect any right to indemnification to which Persons other than the University and officers of the University may be entitled by contract or otherwise.

Changes in Writing. No modification, amendment or waiver of any provision of this Agreement will be effective unless made in a writing signed by both the University and _____.

Saint Joseph's University	_____
By:	By:
_____	_____
Printed:	Printed:
_____	_____
Title:	Title:
_____	_____
Date:	Date:
_____	_____