Chemical Hygiene Plan

Effective Date: Fall 2023, August 1 2024

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Introduction

Bay College has developed this Chemical Hygiene Plan (CHP) to promote the safe operation of college laboratories for faculty, staff, and student employees; and to promote a culture of safety within the College.

This Plan is intended to satisfy the requirements of the US Department of Labor, Occupational Safety and Health Administration 29 CFR 1910.1450 Occupational Exposures to Hazardous Chemicals in Laboratories (referred to as the Laboratory standard) and the Michigan Occupational Safety and Health Act (MIOSHA) for the protection of employees. The CHP is a written program stating the policies, procedures, and responsibilities that protect workers from the health hazards associated with the hazardous chemicals used in that particular workplace.

The Laboratory standard shall supersede, for laboratories, the requirements of all other OSHA health standards in 29 CFR part 1910, subpart Z, except as listed in 1910.1450(a) (see appendix B of this CHP).

In addition, this plan provides guidance for a safe student experience in the laboratories by including Academic Lab Safety Standards for each academic lab.

Exclusions:

The CHP does not apply to activities involving hazardous chemicals that do not meet the definition of "laboratory use" (as defined in the Laboratory Standard).

This document is managed by Steve Carlson, Director of Facilities
steve.carlson@baycollege.edu in collaboration with the Academic Lab Instructors.

Standard Operating Procedures

Standard operating procedures must be provided to all affected laboratory employees. The Standard Operating Procedures in this document specify minimum regulations and recommendations.

This document applies to all laboratories in which hazardous chemicals are used at any time. Hazardous chemicals are defined, according to the laboratory standard, as any chemical which is classified as health hazard or simple asphyxiate in accordance with the Hazard Communication Standard (§1910.1200).

Faculty, staff, and student employees shall follow the Chemical Hygiene Plan to promote health and safety. Students shall follow the Academic Lab Safety Standard for the appropriate academic area in addition to the general safety rules.

The design of the laboratory facility will provide sufficient space for safe work by the number of persons to be in the laboratory. Exit doors will be clearly marked and free of obstructions to permit quick, safe escape in an emergency.
Only students enrolled at Bay College in the specific courses may participate in laboratory exercises, unless there is prior approval by the lab instructor for that specific laboratory.

Laboratory facilities will be used only by persons with proper qualifications and training. The number of students assigned to the laboratory shall not exceed a safe operating number, defined by the lab instructor.

Employees will follow general precautions for handling all laboratory chemicals to minimize all chemical exposures. Specific guidelines found in the appropriate SDS will be followed.

Employees will examine the known hazards associated with the materials being used. Never assume all hazards have been identified. Carefully read the label and corresponding SDS before using an unfamiliar chemical. Determine the potential hazards and use appropriate safety precautions before beginning any new operation.

Employees shall not underestimate the risk of exposure, and exposure to hazardous substances shall be minimized. The decision to use a particular substance will be based on the best available knowledge of each chemical's particular hazard and the availability of proper handling facilities and equipment. Substitutions, either of chemicals or experiments, will be made where appropriate to reduce hazards without sacrificing instructional objectives. When the risk outweighs the benefit and no substitute is available, then the experiment, procedure, or chemical shall be eliminated.

Chemicals shall not be accepted from a supplier unless it is accompanied by the corresponding SDS, or an SDS from that supplier for that chemical is already on file. All SDSs

shall be accessible to employees at all times in the laboratories and chemical preparation rooms. Employees shall be trained to read and use the information found in SDSs.

Employees will be familiar with the location and operation of emergency equipment, such as fire alarms, fire extinguishers, eye wash, and shower stations and know the appropriate emergency response procedures as outlined in the college's Emergency Response Guide.

Employees will avoid distracting or startling other workers when they are handling hazardous chemicals.

Employees will use equipment and hazardous chemicals only for their intended purposes.

Employees will be alert to unsafe conditions and actions. Call attention to them immediately so that corrective action can be taken as quickly as possible.

Employees will wear eye and face protection when appropriate.

Employees will inspect gloves, goggle, and/or other personal protective equipment for leaks, tears, and other damage before handling a hazardous chemical.

Employees will avoid tasting or smelling hazardous chemicals.

To work safely in the lab, employees must know what the risks are, and take precautions to prevent injury. Employees are responsible for:

- Reading all safety material.
- Following all safety guidelines and protocols.
- Reporting any possible hazards or safety concerns to their immediate supervisor.
- Reporting any accidents immediately and filling out an online incident report.

Any failure to meet these responsibilities or to follow the guidelines may result in dismissal.

Information about Hazardous Materials

This workplace is covered by Michigan Right-to-Know Law. Employees have the right to ready access to basic safety information about any hazardous chemicals in the work environment. Employees will have access to Safety Data Sheets (SDS) for all hazardous materials used in the lab. These sheets list the physical properties of the chemicals, hazard warnings, emergency spill information, and health and safety information.

Questions and Concerns

Employees are encouraged to ask questions. Please discuss any concerns related to safety or lab procedures with your supervisor or contact Steve Carlson, steve.carlson@baycollege.edu.

Warning

Intentional disregard for any of these policies, intentional damage of lab equipment, materials, or supplies, or disrespectful behavior of any type may result in immediate dismissal.

General Laboratory Rules and Procedures

- All individuals in the laboratories are expected to follow the rules outlined in this section. These rules and procedures cover general safety in a lab setting. In addition to these general lab rules each academic lab has an Academic Lab Safety Standard.
- All persons will conduct themselves in a responsible manner at all times in the laboratory; horseplay, throwing items, and pranks are prohibited. Use or retention of laboratory supplies or equipment is prohibited unless specifically authorized by a supervisor.
- Employees shall not work alone with hazardous chemicals unless there are other employees in the vicinity and aware of what is happening in the laboratory.
- Touching, smelling, tasting or other close contact with chemicals is strictly forbidden.
- Never pipette by mouth, always use a bulb or other device for suction.
- Students should not insert glass tubing into rubber stoppers. Other employees shall use the appropriate lubricant and hand protection when inserting tubing.
- Proper procedures for Bunsen burners or other sources of flame shall be followed. Never leave a flame unattended.
- Dress appropriately for laboratory work. Loose or baggy clothing and dangling jewelry or other accessories are not permitted. Confine or tie back long hair. Sandals or any open toed shoes are not permitted in the laboratory.
- Should a fire alarm or any other evacuation occur during a lab activity, turn off all Bunsen burners and electrical equipment. Leave the room as directed.
- Heating of glass by employees for purposes of softening or melting should only be done with the utmost care. Appropriate eye and hand protection shall be worn. Students may not heat glass for bending or melting.
- Careful storage and handling procedures shall be used to avoid glassware breakage. In the event of breakage of glass not containing chemicals or biological materials, protection for the hands shall be worn when picking up the broken pieces. Small pieces shall be swept up with a brush and pan. Broken glass shall be separated from other waste by placing it in a special container marked Broken Glass. Broken glass contaminated with chemicals must be treated as hazardous waste. See section G of this Plan for proper procedures.
- The quantities of flammable liquids used in the laboratory shall not exceed the amount that can be consumed in the current experiment.
- Materials shall be stored in the chemical preparation and storage areas.
- Quantities sufficient for the current experiment cycle are permitted in laboratories when properly labeled. See section IV.2 for proper labeling procedures.

Housekeeping Practices

Keep work areas clean and uncluttered. Clean up work areas up work areas upon completion of an operation or at the end of each work day, including floors.

Place all wastes in appropriate, segregated receptacles that are **properly labeled**. See Sections II.8, II.9, and IV.2 for labeling and disposal procedures.

Sinks are to be used only for disposal of water and those solutions designated in Section II.9.a. Other solutions must be placed in the appropriate labeled waste container.

Dispose of waste under the guidance of the laboratory instructor for the course.

A separate waste receptacle must be designated for non-contaminated glass. Glassware and sharp materials are to be placed in the proper container and should never be disposed of in ordinary trash containers.

Clean up all chemical spills immediately and thoroughly according to the guidelines listed in Section II.10 of this document. Ensure that a chemical spill kit is available and that employees know how to use it.

Never block access to emergency equipment, showers, eyewash stations, or exits.

Store chemicals and equipment properly. Chemicals shall not be stored in aisles, on the floor, in stairwells, on desks, or laboratory tables.

Operating hotplates, hot running water, and open flames shall not be left unattended.

Keep all cabinets and drawers closed when not in use to avoid catching and bumping hazards.

Assure that hazardous chemicals are properly segregated into compatible categories.

Food and Drink in the Laboratory

The following statements are the accepted practice on food and drink in laboratories and should be followed at all times (taken from appendix A of the Laboratory Standard). This also applies to adjacent rooms where floor to ceiling walls do not exist.

Eating, drinking, smoking, gum chewing, applying cosmetics, and taking medicine in laboratories where hazardous chemicals are used or stored should be strictly prohibited.

Food, beverages, cups, and other drinking and eating utensils should not be stored in areas where hazardous chemicals are handled or stored.

Laboratory refrigerators, ice chests, cold rooms, and ovens should not be used for food storage or preparation.

Chemical Handling and Storage

Efforts should be made to order chemicals in quantities that are likely to be consumed in one year and shall be purchased only in the quantity sufficient for the declared use. Ordering chemicals will follow the college process outlined in APPENDIX C.

A chemical shall not be accepted without an adequate identifying label and the associated SDS in the MSDSonline system.

The container shall be marked with date it is received.

Laboratory chemicals not in the inventory listing may not be stored or brought into the laboratory or other areas of the College.

Donated chemicals shall not be accepted.

Chemicals shall be inventoried as described in Section IV.1.

All chemicals shall be in tightly closed, sturdy, and in appropriate containers.

If the chemical has been transferred to a secondary container, the new container shall have an adequate identifying label. This label will include the name of the chemical, the concentration (if in solution), the solvent (if in solution with a solvent other than water), the date that it was transferred, and the initials of the person that transferred the chemical.

Chemicals shall be stored based on the reactive nature and compatibility group of the chemical.

Large containers and containers with reactive chemicals, such as acids and bases, shall be stored on low shelves.

Flammable chemicals shall be stored in approved storage containers and in approved flammable chemical storage cabinets.

No secondary storage of materials other than chemicals shall be stored in Chemical Storage Rooms.
All storage areas shall be securely locked when not in use. Storage and preparation areas shall be accessible only to those persons authorized to access the chemicals.

Glass bottles containing highly flammable liquids (Class 1A) shall not exceed 500mL. For larger volumes, metal or approved plastic may not exceed 1 gallon, and safety cans shall not exceed 2 gallons.

Chemicals shall not be distributed for purposes other than instruction. Chemicals transferred to other locations off of the main campus, but within the college, shall be accompanied by their applicable SDS information.

Refrigerators used to store flammable chemicals shall be labeled and shall be of explosion proof or of lab safe design.

Chemicals transported in elevators shall be protected from breakage and carried in secondary containers that will contain spills, such as unbreakable tubs. All chemicals transported in elevators shall be carried by cart, not by hand. The elevator shall not be used by the public during transportation of significant quantities (over 100 grams) of chemicals.

Secondary containment devices should be used when transporting chemicals. When transporting chemicals outside of the laboratory or between stockrooms and laboratories, the transport container should be break- resistant. High-traffic areas should be avoided.

Compressed Gases

A compressed gas is defined as any material or mixture having in the container either an absolute pressure greater than 276 kPa (40 lb/in 2) at 21 °C, or an absolute pressure greater than 717 kPa (104 lb/in2) at 54 °C or both, or any liquid flammable material having a Reid vapor pressure greater than 276 kPa (40 lb/in2) at 38 °C.

Gas cylinders shall only be moved from one location to another with the protective cap securely in place.

A wheeled gas cylinder carrier will be used when moving a cylinder. Moving cylinders by rolling is prohibited.

Both full and empty cylinders shall only be stored where they may be securely restrained by straps, chains, or a suitable stand.

A cylinder shall be considered empty when there is still a slight positive pressure and an "EMPTY" label placed on it.

An empty cylinder shall be returned to the supplier as soon as possible after having been emptied or when it is no longer needed.

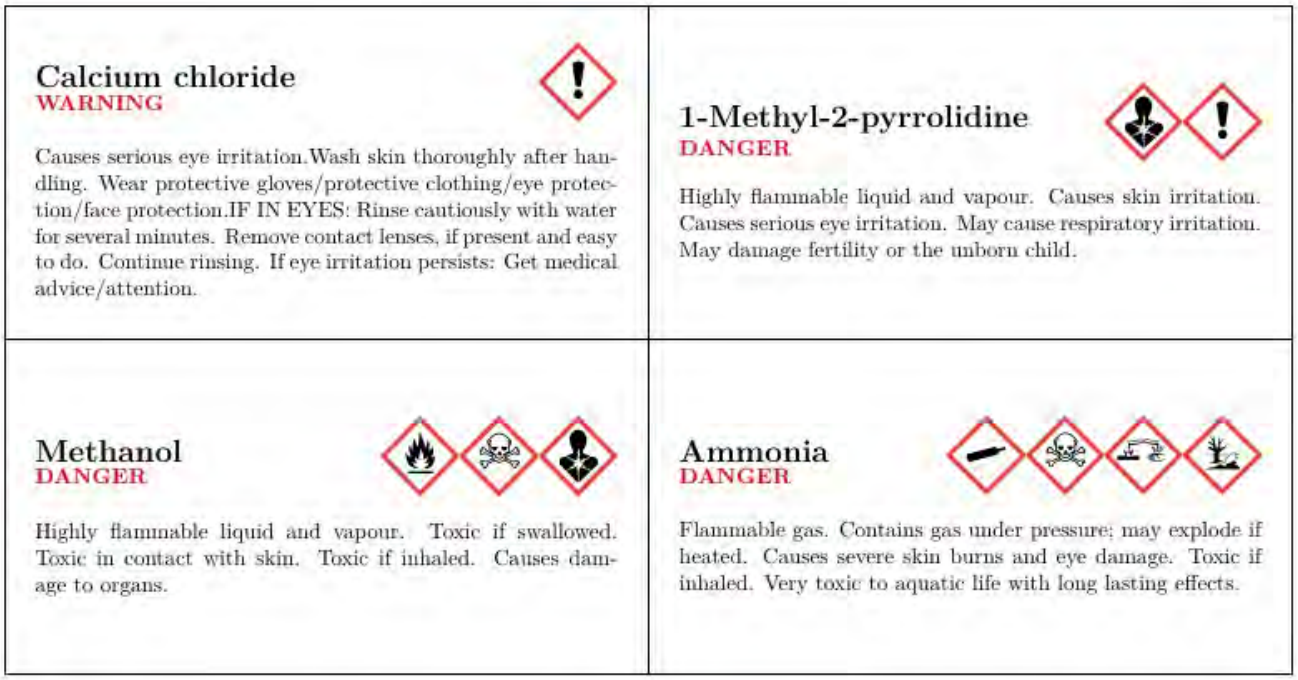
Cylinders shall not be exposed to temperatures above 50°C.

Store flammable gases separately from oxidizer gases.

Secondary Container Labeling

When a chemical is transferred to a secondary container, the new container shall have an adequate identifying label. This label will include the following:

- Name of the chemical
- Concentration (if in solution)
- Solvent (if in solution with a solvent other than water)
- Date that it was transferred
- Initials of the person that transferred the chemical
- GHS pictogram labels (see below)



Waste Minimization and Disposal

The Bay College Facilities Department shall ensure that the disposal of laboratory chemicals follows the Michigan Department of Environmental Quality, Hazardous Waste Management Rules.

The College is considered a Small Quantity Generator according to the Michigan Hazardous Waste Rules.

- Waste Minimization: Employees shall minimize generation of hazardous wastes by:
  - Using microscale labs and selecting less hazardous materials. o Ordering chemicals in quantities that are likely to be consumed in one year or less.
  - Avoiding the inadvertent accumulation of hazardous waste. Potential waste materials are surplus, old, and/or unnecessary chemicals. o Determining if the material will need to be treated as hazardous waste by referring to the Hazardous Waste Management Rules prior to ordering new chemicals.

Hazardous Waste Disposal

All hazardous materials shall be disposed of in accordance with Michigan Hazardous Waste Management rules.

Only non-hazardous aqueous solutions between pH 3 and pH 9 may be poured down the drain.

Separate hazardous waste containers shall be provided by the Lab Instructor for inorganic, organic, heavy metal compounds, chlorinated hydrocarbons, and non-chlorinated hydrocarbons or other categories as needed.

Waste chemicals shall be stored in appropriately labeled containers, inside secondary containment.

Hazardous wastes shall never be placed in any common solid trash container.

When the waste containers become full, or after the academic year, the containers shall be stored in the designated waste fume hood. Waste containers will be disposed of at least once per academic year.

Unlabeled containers apparently containing liquid and/or solid chemicals shall be treated as hazardous waste and disposed of using the procedures describe above.

Spills

If the chemical involved in the spill is judged to present an immediate hazard, evacuation is to be absolute, and the area shall be isolated until the Facilities Department is contacted and a HAZMAT team arrives.

If hazardous vapors are present, the area shall be isolated, and the Facilities Department contacted. Only personnel trained in the use of respirators may enter the area.

If a volatile, flammable material is spilled, immediately extinguish flames such as Bunsen burners and evacuate the area. Consult the SDS for appropriate cleanup procedures. If the quantity exceeds the employee's ability or training to handle the spill, seal the area and contact the Facilities Department.

If there is no immediate danger (flammability, toxicity, reactivity, corrosivity) to employees or students, and the spill can be contained, containment shall be accomplished by use of spill pillows, towels, rolls, or other devices that will keep the spill from spreading. If a major spill occurs (cannot be cleaned-up safely by employees present in the lab), the Facilities Department should be contacted.
If there is no immediate danger, cleanup procedures listed on the SDS shall be followed. Appropriate personal protective equipment shall be used.

A spill kit shall be maintained in each laboratory working with chemicals. Spill kits for lab rooms will include absorbent material, gloves, good quality absorbent paper towels, broom, dustpan and bucket. Kits shall be inspected before the beginning of each semester by the Lab Instructor.

If the spill material is a hazardous chemical, all of the materials involved in the cleanup will be considered to be hazardous waste and must be disposed of as such.

Control Measures

Personal Protective Equipment

It is the responsibility of the College to provide appropriate safety and emergency equipment for employees and students.

Laboratory aprons or coats, eye protection, and non-permeable gloves are considered standard equipment for College laboratory courses and will be used as specified in the laboratory experiment procedures and/or as indicated by the Laboratory Instructor. The Chemical Safety Committee shall annually review protective equipment requirements for all laboratory courses.

Protective apparel shall be compatible with the required degree of protection for the substances being handled.

All eye protection devices used in the science laboratories shall conform to ANSI Standard Z87.1-2003. Eyeglasses, even with side shields, are not acceptable protection against chemical splashes.

Any experiment that involves heating or the use of chemicals, or glassware shall require the use of chemical splash safety goggles.

Full face shields protect the face and throat. They must be worn for protection when there is a greater risk of injury from flying particles and harmful chemical splashes. A full-face shield shall also be worn when an operation involves a pressurized or evacuated system. For full protection, safety goggles must be worn with the face shield.

Standing shields shall be used when there is a potential for explosions, implosions, or splashes, or when corrosive liquids are used. The standing safety shield shall be used with safety goggles and, if appropriate, with a face shield.

When gloves are required, the SDS shall be consulted for information regarding the proper type of gloves to be used. The correct type of gloves shall be available in every laboratory for the procedures to be carried on that day.

Administrative Controls

Inventory Control

A chemical inventory shall be managed through MSDSonline and audited annually by the Facilities Department. An inventory will be performed by Lab Instructors and employees who store chemicals, annually in the spring.

The chemical inventory list shall contain the following information about each chemical found in storage: the chemical name, location, the date received, the vendor, the amount present, and the expiration date for review for possible disposal.

Hazard Identification and Labels

Labels on incoming containers of hazardous chemicals are not to be removed or defaced.

Stock laboratory chemicals shall be properly labeled to identify any hazards associated with them for the employee's information and protection.

If a chemical is stored in its original bottle, it shall have the manufacturer's original label identifying potential hazards and the date of purchase.

If a chemical has been transferred to a secondary container, the new container shall be appropriately labeled with the chemical name, concentration (if in solution), solvent (if in solution other than water), date that it was transferred, and initials of the person responsible for the transfer.

Unlabeled bottles shall not be opened, and such materials shall be disposed of promptly, as outlined in the section on disposal procedures.

Signs and Posters

Emergency telephone number is 911.

Signs shall be used to indicate the location of exits, evacuation routes, safety showers, eyewash stations, fire extinguishers, fire blankets, first aid kits, fume hoods, other safety equipment.

Safety Data Sheets

SDSs for all chemicals shall be maintained by Lab Instructors and made readily available in each laboratory. Online access to SDSs is available through MSDSonline. The direct link is listed below. https://chemmanagement.ehs.com/9/1628871d-b554-47ce-956c-9bc48e607c90

The safety data sheets for each chemical in the laboratory usually give recommended limits or OSHA - mandated limits, or both, as guidelines to exposure limits. Typical limits are expressed as threshold limit values (TLVs), permissible exposure limits (PELs), or action levels. When such limits are stated, that limit, along with any other information about the hazardous characteristics of the chemical, shall be used to set laboratory guidelines. These laboratory guidelines shall be used in determining the safety precautions, control measures, and personal protective equipment that apply when working with the toxic chemical.

Records

Chemical inventory is maintained in the MSDSonline system and is organized by building and storage area.

Inspection Records

Safety equipment shall be marked to indicate the date and the results of the last inspection conducted by the Facilities Department.

Records indicating the dates of repairs and regular maintenance of safety equipment shall be retained by the Facilities Department.

Training Records: The College's Human Resources Department shall maintain records of employee training and records of completed training.

Incident Report: Incident reports will be completed by the person or persons involved in an incident. Incident reports are reviewed, acted upon, and resolved through the Facilities Department. Incident reports are online at

https://cm.maxient.com/reportingform.php?BayCollege&layout_id=0

Medical and Exposure Records: Records of air concentration monitoring shall be maintained by the Facilities Department. Exposure assessments, medical consultations, and medical examinations shall be maintained by the Human Resources Department.

Waste Disposal Records: The Facilities Department shall retain records of disposal of hazardous waste. The records shall conform to the requirements of the Michigan Department of Environmental Quality Hazardous Waste Rules.

Exposure Monitoring

If there is reason to believe that exposure levels for a regulated substance have exceeded the action level or permissible exposure limit, the Facilities Department shall ensure that the employee or student exposure to that substance is measured.

If a substance has an exposure monitoring requirement and if there is reason to believe that exposure levels for that substance routinely exceed the action level or in the absence of the action level, the PEL, the Facilities Department shall be notified.

In the event that an employee is exposed to levels of a hazardous chemical exceeding the established PEL or TLV, or shall the employee exhibit signs or symptoms of such exposure, the employee shall be provided appropriate medical treatment by contacting the Human Resources Department.

Safety/Emergency Facilities and Equipment

Equipment

The Facilities Department shall ensure that adequate emergency equipment is available in the laboratory and inspected periodically to ensure that it is functioning properly. Records of these inspections will be held in the Facilities Department. All employees shall be properly trained in the use of each item.

Emergency equipment items that shall be available include: eyewash station, fire extinguisher of the appropriate type, safety shower, telephone for emergencies, fire blanket, and identification signs.

Each laboratory shall have a standard first aid kit inspected and stocked according to the Facilities Department's policy.

Multipurpose fire extinguishers shall be available in the laboratory. A multipurpose, ABC, fire extinguisher, can be used on all fires EXCEPT for class D fires. Extinguishers shall be visually checked monthly and inspected and tested annually by the Facilities Department.

Every eye wash station will be capable of supplying a continuous flow of aerated, tepid, potable water to both eyes for at least 20 minutes. The valve shall remain in the open position without the need to hold the valve. Eyewashes shall be inspected at least twice a year, and marked to document this inspection and use by the Facilities Department.

Safety showers shall be capable of supplying a continuous flow of tepid potable water for at least 20 minutes.

The shower shall have a quick - opening valve requiring manual closing. (ANSI Z358.1-1990). The valve shall remain in the open position without the need to hold the valve. Safety showers shall be inspected and operated at least twice a year and marked to document this inspection and use by the Facilities Department.

Laboratories in which hazardous substances are being used shall have spill control kits.

Facilities

Fume hoods

Laboratory classroom fume hoods are not to be used for either storage or disposal of chemicals.

Laboratory activities that may release airborne contaminants above the Permissible Exposure Limit (PEL) or Thresholds Limit Value (TLV) concentrations must be carried out in the fume hood. Also, if laboratory activities produce potentially hazardous vapors or gaseous substances, the laboratory activities shall be conducted in the fume hood.

All fume hoods shall be inspected annually and certified by the Facilities Department. Any hood not passing inspection must be taken out of service immediately and not be used until such time as the hood has passed inspection. It is the responsibility of the College to purchase the parts and replace the unit in a timely fashion so as not to endanger the health and wellbeing of the employee/student or place the facility at risk.

Ventilation

Ventilation systems shall be constructed and maintained to comply with MIOHSA or other applicable standards. Inspection and certification of ventilation systems will be carried out by the Facilities Department.

Flammable Storage

Chemicals with a flash point below 93.3 °C (200 °F) shall be considered "fire hazard chemicals". Any chemical whose SDS or label states "Flammable" is in this category.

Fire hazard chemicals in excess of 500 mL shall be stored in a flammable solvent storage area, safety cans, or in storage cabinets designed for flammable materials.

Flammable materials shall be stored in a flammable liquid storage cabinet or other appropriate location.

When transferring significant quantities of flammable liquids from one container to another, it is particularly important that they be properly grounded (by touching hand to work surface prior to pouring) to prevent accidental ignition of flammable vapors and liquids from static electricity or other sources of ignition. Large quantities of flammable chemicals stored outside cabinets shall be in flame-proof storage cans which conform to NFPA guidelines and/or the applicable local fire codes.

Electrical

All building electrical systems shall be constructed and maintained in accordance with state and local applicable standards.

In the event that power needs to be immediately turned off at the circuit breaker, contact the Facilities Department.

Training and Information

Training for Employees

The College shall provide employees with information and training to ensure that they are aware of the hazards of chemicals present in their work area. New employees are assigned the Hazardous Communication online training automatically when they are activated as an employee in the college's ERP. The Human Resources Department is responsible for tracking completion of this course annually. Lab Instructors are responsible for training new employees on their specific labs standard operating procedures.

The College shall provide Right-To-Know training opportunities for all laboratory employees at risk. The College shall provide training opportunities for all laboratory employees at risk about the hazards of chemicals present in the laboratory and sources of information concerning hazards in the laboratory. In particular, the training program shall cover the Chemical Hygiene Plan (CHP), safety data sheets, and the responsibilities of employees. Employees shall be trained on the potential chemical hazards in the employees' work areas and on appropriate sections of the chemical hygiene plan. This training shall be provided to all employees who actually work in the laboratory, as well as to other employees whose assignments may require that they enter a laboratory where exposure to hazardous chemicals might occur. Employees who are responsible for receiving and handling shipments of new chemicals or chemical wastes shall also be informed of the potential hazards and appropriate protective measures for chemicals they may receive.

Laboratory employees shall be trained on the applicable details of the CHP, including a review of the general rules of laboratory safety. The training program shall describe appropriate sections of the standard operating procedures. The training an employee receives shall be determined by the nature of the work assignment in the laboratory.

Employees shall be trained in measures they may take to protect themselves from exposure to hazardous chemicals, including the location and proper use of protective equipment and emergency equipment. In addition, the training must also include a discussion of inventory procedures to be followed, proper storage and ordering rules, and hazardous waste disposal procedures.

All laboratory employees will be trained to read and understand SDSs.

All employees shall be trained in labeling and storage practices (see section II.B.2.).

Training shall be carried out by the Lab Instructor.

Access to Information

Employees shall be informed of the location, availability, content and use of:

- the "Laboratory Standard" 29 CFR Part 1910.1450
- the Chemical Hygiene Plan (CHP)
- the safety data sheets (SDSs)
- personal protective equipment (PPE) and emergency equipment as outlined in the CHP.

Training for Students

Lab Instructors shall provide a safe environment for student learning by providing safety training to students.

At the beginning of the term and prior to laboratory activities, class time shall be devoted to safe laboratory practices and to the student safety agreement.

Instruction in laboratory safety shall be provided to all students enrolled in laboratory classes. Students enrolling after safety instruction has taken place shall receive instruction prior to being permitted to engage in laboratory activities.

The extent of student training shall be based on their course of study, the laboratory facility, College policies, the chemical hygiene plan, and the level of chemical handling and potential exposure to hazardous chemicals.
Safety training shall include the importance and the content of the label and of material safety data sheets. As appropriate, the student shall also be introduced to other sources of chemical safety information.

Approval of Experimental Design

Support by the Chemical Safety Committee is required if there is a significant change in an existing experiment, such as the amounts or identities of materials being used or the conditions under which the experiment is to be conducted. Existing laboratory experiments will be reviewed by the Chemical Safety Committee on an on-going basis. The criteria for approval of laboratory experiments will be based on the best available knowledge of the hazards of the substance and the availability of proper handling facilities and equipment. Important factors to consider when reviewing should include:

- Is use of the chemical pedagogically sound?
- Are adequate safeguards in place to assure proper use of the substance?
- Is the exposure time of the employees and students to the substance minimal and acceptable?

Responsibilities

Chemical Safety Committee

The Chemical Safety committee is comprised of all Departmental Chemical Hygiene Officers (DCHO), the Coordinator of Chemical Hygiene Officers (CCHO), and one representative from Maintenance from each campus. The committee will be chaired by the CCHO. The committee is responsible for the following:

- Assignment of Departmental Chemical Hygiene Officers, this will occur annually in September
- Annual review of the Chemical Hygiene Plan (CHP), updates will be made in the summer from June-August
- Review the adequacy of the chemical inventory and oversee inventory in their respective area(s)
- Review training content for students and employees and recommend improvements
- Work with administrators and instructors to develop and implement the safety program

2023-2024 Departmental Chemical Hygiene Officers

Bay College does not have a single Chemical Hygiene Officer (CHO) but instead shares the responsibilities across all academic areas with oversight from the Chemical Safety Committee. Each academic area has a representative Departmental Chemical Hygiene Officer (DCHO) who provides guidance and oversight for that specific academic area. Assignment is renewed or replaced annually in September.

Brian Black, Instructor, Math/Science Division, Biology 906-217-4051 Chris Gravatt, Instructor, Math/Science Division, Chemistry 906-217-4063

Amy Anderson, Instructor, Allied Health Division, EMT/Paramedic 906-217-4142

Evelyn Norkoli, Dean, Allied Health Division, Nursing 906-217-4152

Larry Sundling, Instructor, Math/Science Division, Water Tech 906-217-4002

Kristine Granger, Instructor, Arts & Letters Division, Arts 906-217-4252

Marc Morency, Instructor, Biology Iron Mountain Campus 906-302-3019

Steven Carlson, Director of Facilities, Facilities, Maintenance 906-217-4080

John Lewandowski, Mgr. Facilities Support Service, Custodial 906-217-4094

Pat Bazan, Bldg Maintenance Manager, Facilities, Iron Mountain 906-302-3022

Nick Dupont, Instructor, Math/Science Division, Welding 906-217-4173

Michael Gardner, Instructor, Math/Science Division, Automotive 906-217-4234

Employees

Employees who normally work in a laboratory are responsible for:

- Participating in required training programs provided by the College
- Maintaining an awareness of health and safety hazards
- Planning and conducting each operation in accordance with the chemical hygiene plan procedures
- Consulting reference materials, including SDSs, related to chemical safety where appropriate
- Using and modeling good personal chemical hygiene habits
- Reporting accidents, injuries, unsafe practices, and unsafe conditions

Students

Students shall practice good chemical hygiene habits. They shall report accidents and maintain an awareness of health and safety hazards. Students shall conduct all activities according to the chemical hygiene plan procedures.

Bay College has developed the following list of rules for all students engaged in a laboratory course involving hazardous chemicals. All students participating in laboratory courses involving hazardous chemicals will be required to sign a safety contract. The document should be signed by students on the first day of the laboratory class immediately following a presentation by the instructor outlining the laboratory safety procedures. It is the laboratory instructor's responsibility to inform the students of the rules and ensure that they sign and follow the safety contract. The instructor will keep the signature sheet for at least one semester after the conclusion of the course.

Academic Lab Safety Standards

Chemistry Lab Standards

Wear approved and appropriate goggles at all times when working in the laboratory. There will be no exceptions to this rule! Contact lenses should not be worn in the laboratory unless you have permission from your instructor.

Inform your instructor if you are pregnant or have any allergies or medical conditions that may require immediate assistance.

Confine long hair whenever you are in the laboratory. Always wear shoes and clothing that protect your body. Sandals or other open shoes, shorts and short skirts are not permitted in the laboratory.

Never work alone. No student may work in the laboratory without an instructor present.

Do not eat food, drink beverages, or chew gum in the laboratory. Do not use laboratory glassware as containers for food or beverages.

Perform only those experiments authorized by the instructor. Never do anything in the laboratory that is not called for in the laboratory procedures or by your instructor. Carefully follow all instructions, both written and oral. Unauthorized experiments are prohibited.

Be prepared for your work in the laboratory. Read all procedures thoroughly before entering the laboratory. Your laboratory instructor will discuss any safety hazards that may be associated with an experiment at the beginning of the laboratory session.

Work areas should be kept clean and tidy at all times. Bring only your laboratory instructions, worksheets, and/or reports to the work area. Other materials (books, purses, backpacks, etc.) should be stored at the table or coat rack.

Know the locations and operating procedures of all safety equipment including the first aid kit, eyewash station, safety shower, fire extinguisher, and fire blanket. Know where the exits are located.

Dispose of all chemical waste properly. Check the label of all waste containers twice before adding your chemical waste to the container.

Keep hands away from face, eyes, mouth and body while using chemicals. Wash your hands with soap and water after performing all experiments. Clean (with detergent), rinse, and wipe dry all work surfaces (including the sink) and apparatus at the end of the experiment. Return all equipment clean and in working order to the proper storage area.

Experiments must be personally monitored at all times. You will be assigned a laboratory station at which to work. Do not wander around the room, distract other students, or interfere with the laboratory experiments of others. Never leave an experiment that requires heating or running water unattended.

Students are never permitted in the chemical storage room or preparation area unless given specific permission by their instructor.

Report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the instructor immediately.

All chemicals in the laboratory are to be considered dangerous. Do not touch, taste, or smell any chemicals unless specifically instructed to do so. The proper technique for smelling chemical fumes will be demonstrated to you.

Check the label on chemical bottles twice before removing any of the contents. Take only as much chemical as you need.

Never return unused chemicals to their original containers.

Never use mouth suction to fill a pipet. Use a rubber bulb or pipet pump.

Never remove chemicals, glassware or equipment from the laboratory.

Do not force glass tubing or thermometers into rubber stoppers. Your laboratory instructor will instruct you on the correct procedure.

Examine glassware before each use. Never use chipped or cracked glassware. Never use dirty glassware.

Do not place hot apparatus directly on the laboratory desk. Always use an insulating pad. Allow plenty of time for hot apparatus to cool before touching it.

Never use an open flame to heat organic solvents.

Biology Lab Standards

Follow the **Aseptic Protocol** (below) when necessary.

Whenever chemical or biological hazards are present in the lab, the following procedure should be followed:

- When entering the lab, store all coats, books, and knapsacks in the coat room or under your bench. Wash your hands and check that your hair and apparel appropriate.
- Wipe down and clean your bench with 10% bleach and put used paper towels in the regular trash. Wear the prescribed safety equipment. This may include goggles, gloves, smocks, aprons, face shields, or anything else deemed appropriate by your instructor.
- Keep your bench clear of clothes, books, and paperwork. Take care not to ignite or contaminate any books or papers being used in the lab.
- Follow all safety regulations, including any special instructions associated with the particular lab.
- If you leave the lab for a break, wash your hands and clean your bench top.
- When you have completed the lab, dispose of all wastes in properly labeled waste containers. Clean and store all glassware, equipment, and supplies properly. Clean your bench, push in your chair, and wash your hands.

Report all accidents, fires, and personal injuries, chemical or microbial spills to your instructor immediately. Call 911 for all emergencies (fires, explosions, life threatening or serious injuries, crimes in progress, hazardous material release). Know the locations of the nearest telephone, first aid supplies, eyewash fountain, shower, fire extinguishers, blankets, and alarms, spill kits, and all exits.

NEVER eat, drink, smoke, or apply cosmetics in the lab room.

Tie back long hair at all times.

Do NOT wear contact lenses in the lab (unless you wear goggles).

Before leaving the lab, you must clean up your bench and return all materials to their proper places.

Handle all equipment with care. Clean and store all equipment after use. You may be held responsible for damaged or broken equipment.

Always wear closed toed shoes in the lab (no sandals).
Inform your instructor if you are pregnant or have any allergies or medical conditions that may require immediate assistance.

Do not bring friends or guests to the lab.

All wastes produced in this lab must be disposed of in properly labeled containers.

- *Broken glassware* and disposable glass supplies should be placed in containers labeled for this purpose.

- *Chemical wastes* should be placed in specially labeled, designated containers.

- *Dissected preserved specimens* will be disposed of in specially labeled containers.
- *Biological wastes (any material exposed to living microorganisms, DNA, or blood)* are considered hazardous and must be disposed of in properly labeled biohazard containers.
- *Other routine wastes* may be placed in the regular garbage cans.

You are encouraged to ask questions at all times. Please discuss any concerns you have related to safety or lab procedures with your instructor as soon as possible.

Warning

Intentional disregard for any of these policies, intentional damage of lab equipment, materials, or supplies, or disrespectful behavior of any type may result in immediate dismissal from this course. **A&P Lab Standards**

Water Technology Lab Standards

Nursing Lab Standards

Automotive Lab Standards

Welding Lab Standards

Art Lab Standards

APPENDIX A

Definitions and Procedures for Use of Particularly Hazardous Substances (PHS)

General

This section of the plan describes the specific and general control measures which are designed to reduce the exposure of instructors, aides, students, and other employees to particularly hazardous substances. Employees shall read and understand these practices before commencing a procedure using particularly hazardous substances. The use of these substances requires submission of a Standard Operating Procedure (SOP) that details the chemical, associated hazards, SDS, appropriate controls, cleanup and disposal process, and PPE requirements. The SOP is submitted to the Departmental Chemical Hygiene Officer for that specific academic area for approval.

1. PHSs include **highly toxic chemicals, highly flammable chemicals, highly reactive chemicals, and highly corrosive chemicals, reproductive toxins, and select carcinogens.**

2. PHSs shall be used in designated areas and in fume hoods.

3. The use of PHSs shall require removal of contaminated waste and the decontamination of contaminated areas.

Highly Toxic Chemicals

1. When a PEL or TLV value is less than 50 ppm or 100 mg/m^3, the user shall use it in an operating fume hood, glove box, vacuum line, or other device equipped with appropriate traps. If none is available, no work shall be performed using the chemical.

2. If a PEL, TLV, or comparable value is not available, the animal or human median inhalation lethal concentration information, LC 50, shall be used as a guideline. If that value is less than 200 ppm or 2000 mg/m^3 when administered continuously for one hour or less, then the chemical shall be used in an operating fume hood, glove box, vacuum line, or other device equipped with appropriate traps. If none are available, no work shall be performed using that chemical.

3. Examples of highly toxic chemicals (acute or chronic) that were commonly used are benzene, chloroform, formaldehyde, bromine, carbon disulfide, carbon tetrachloride, cyanide salts, and hydrofluoric acid.

Highly Flammable Chemicals

1. Class 1A liquids as highly flammable chemicals. Class 1A liquids have a flashpoint of less than 73 ° C and a boiling point of less than 100 ° C.

2. Highly flammable chemicals shall be used only in approved fume hoods, and shall be kept away from sources of possible ignition (such as sparks, flames, hot surfaces, etc)

3. Examples of highly flammable chemicals are diethyl ether, acetone, pentane, petroleum ether, acetaldehyde, and ligroines.

Highly Reactive Chemicals

1. Reactivity information may be given in a manufacturers' MSDSs and on labels. The most complete and reliable reference on chemical reactivity is the current edition of Bretherick's Handbook of Reactive Chemical Hazards (a copy of the 7th edition is available in the Bay College Library).

2. A reactive chemical is one that:

    - Is described as such on the label, in the SDS, or by Bretherick.
    - Is ranked by the NFPA as 3 or 4 for reactivity.
    - Is identified by the Department of Transportation (DOT) as an oxidizer, an organic peroxide, or an explosive (Class A, B, or C).
    - Fits the Environmental Protection Agency definition of reactive in 40 CFR 261.23.
    - Is known or found to be reactive with other substances.

3. Reactive chemicals shall be handled with all proper safety precautions, including segregation in storage, and prohibition of mixing even small quantities with other chemicals without prior approval and appropriate personal protection and precautions.

4. Examples of commonly encountered highly reactive chemicals are ammonium dichromate, nitric acid, perchloric acid, hydrogen peroxide, and potassium chlorate, azides, organic nitrates, and acetylides.

Highly Corrosive Chemicals and Contact Hazard Chemicals

1. A corrosive chemical is one that is known to damage substances they come in contact with and are immediately reactive to living tissue, causing visible destruction, or irreversible alterations of the tissue at the site of contact. Always check chemical product information. Some common corrosive acids include hydrochloric acid, sulfuric acid, and nitric acid. Examples of corrosive bases are ammonium hydroxide, potassium hydroxide, and sodium hydroxide.

2. A contact - hazard chemical is an allergen or sensitizer that:

    a. Is so identified or described in the MSDS or on the label.

    b. Is so identified or described in medical or industrial hygiene literature.

    c. Is known to be an allergen or sensitizer.

3. Corrosive and contact hazard chemicals will be handled with all proper safety precautions, including wearing safety goggles, using gloves tested for the absence of pinholes and known to be resistant to permeation or penetration by the chemical, and wearing a laboratory apron or laboratory coat.

4. Examples of highly corrosive chemicals are hydrochloric, sulfuric, nitric, phosphoric, and perchloric acids, and potassium hydroxide.

Reproductive Toxins

1. A reproductive toxin refers to chemicals which affect reproductive capabilities including chromosomal damage (mutations) and which effect fetuses (teratogenesis).

2. A reproductive toxin is a compound that:

    a. Is described as such in the applicable MSDS or label.

    b. Is identified as such in the Handbook of Toxicology, section XX.

3. No reproductive toxins shall be allowed in the College laboratories without written authorization from the Departmental Chemical Hygiene Officer.

4. If such chemicals are used:

a. They shall be handled only in a hood and when satisfactory performance of the hood has been confirmed.

b. Skin contact shall be avoided by using gloves and wearing protective apparel.

c. Persons using such substances shall always wash hands and arms immediately after working with these materials.

d. Unbreakable containers of these substances shall be stored in a well-ventilated area and will be labeled properly.

Examples of reproductive toxins are organ mercurial compounds and ethidium bromide, carbon disulfide, xylene, toluene, benzene, mercury, lead compounds, ethyl ethers, vinyl chloride.

Select Carcinogens

1. Select carcinogen means any substance which meets one of the following criteria:

    a. It is regulated by MIOSHA as a carcinogen.

    b. It is listed under the category, "known to be carcinogens," in the National Toxicology Program (NTP) Annual Reports on Carcinogens.

    c. It is listed under Group 1 "carcinogenic to humans" by the International Agency for Research on Cancer Monograms (IARC).

    d. It is listed in either Group 2 A or 2 B by IARC or under the category "reasonably anticipated to be carcinogens" and causes statistically significant tumor incident in experimental animals under set criteria of exposure.

2. All work with these substances shall be conducted in a designated area, such as a fume hood, glove box, or a portion of a laboratory designated for use of chronically toxic substances. Such a designated area shall be clearly marked with warning and restricted access signs.

3. Any procedure that may result in a generation of aerosols or vapors shall be performed in a hood whose performance is known to be satisfactory.

4. Skin contact shall be avoided by using gloves and other protective apparel as appropriate. Any protective clothing shall be removed before leaving the designated area and placed in a labeled container. Hands, arms, and neck shall be washed after working with these materials.

5. Select carcinogens shall be stored in unbreakable containers in a ventilated area with controlled access. All containers shall be labeled with the identity and hazard of the substance.

6. Immediately upon completion of the project, all unused carcinogens shall be disposed of following standard hazardous waste disposal procedures.
7. Examples of select carcinogens are benzene, nickel metal dust, vinyl chloride, and formaldehyde.

APPENDIX B

Occupational Exposure to Hazardous Chemicals in Laboratories

The following content is taken from https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10106

- Part Number: 1910
- Part Title: Occupational Safety and Health Standards
- Subpart: Z
- Subpart Title: Toxic and Hazardous Substances
- Standard Number:1910.1450
- Title: Occupational exposure to hazardous chemicals in laboratories.
- Appendix: A , B
- GPO Source: e-CFR

1910.1450(a)

Scope and application.

1910.1450(a)(1)

This section shall apply to all employers engaged in the laboratory use of hazardous chemicals as defined below.

1910.1450(a)(2)

Where this section applies, it shall supersede, for laboratories, the requirements of all other OSHA health standards in 29 CFR part 1910, subpart Z, except as follows:

1910.1450(a)(2)(i)

For any OSHA health standard, only the requirement to limit employee exposure to the specific permissible exposure limit shall apply for laboratories, unless that particular standard states otherwise or unless the conditions of paragraph (a)(2)(iii) of this section apply.

1910.1450(a)(2)(ii)

Prohibition of eye and skin contact where specified by any OSHA health standard shall be observed.

1910.1450(a)(2)(iii)

Where the action level (or in the absence of an action level, the permissible exposure limit) is routinely exceeded for an OSHA regulated substance with exposure monitoring and medical surveillance requirements paragraphs (d) and (g)(1)(ii) of this section shall apply.

1910.1450(a)(3)
This section shall not apply to:

1910.1450(a)(3)(i)

Uses of hazardous chemicals which do not meet the definition of laboratory use, and in such cases, the employer shall comply with the relevant standard in 29 CFR part 1910, subpart Z, even if such use occurs in a laboratory.

1910.1450(a)(3)(ii)

Laboratory uses of hazardous chemicals which provide no potential for employee exposure. Examples of such conditions might include:

1910.1450(a)(3)(ii)(A)

Procedures using chemically-impregnated test media such as Dip-and-Read tests where a reagent strip is dipped into the specimen to be tested and the results are interpreted by comparing the color reaction to a color chart supplied by the manufacturer of the test strip; and

1910.1450(a)(3)(ii)(B)

Commercially prepared kits such as those used in performing pregnancy tests in which all of the reagents needed to conduct the test are contained in the kit.

1910.1450(b)

Definitions —

Action level means a concentration designated in 29 CFR part 1910 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.

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee. Carcinogen (see select carcinogen).

Departmental Chemical Hygiene Officer means an employee who is designated 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. This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure.

Chemical Hygiene Plan means a written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment and work practices that (i) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace and (ii) meets the requirements of paragraph (e) of this section.

Emergency means any occurrence such as, but not limited to, equipment failure, rupture of containers or failure of control equipment which results in an uncontrolled release of a hazardous chemical into the workplace.

Employee means an individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

Hazardous chemical means any chemical which is classified as health hazard or simple asphyxiant in accordance with the Hazard Communication Standard (§1910.1200).

Health hazard means a chemical that is classified as posing one of the following hazardous effects: Acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); aspiration hazard. The criteria for determining whether a chemical is classified as a health hazard are detailed in appendix A of the Hazard Communication Standard (§1910.1200) and §1910.1200(c) (definition of "simple asphyxiant").

Laboratory means a facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a nonproduction basis.

Laboratory scale means work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.

Laboratory-type hood means a device located in a laboratory, enclosure on five sides with a moveable sash or fixed partial enclosed 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 employee's body other than hands and arms.

Walk-in hoods with adjustable sashes meet the above definition provided that the sashes are adjusted during use so that the airflow and the exhaust of air contaminants are not compromised and employees do not work inside the enclosure during the release of airborne hazardous chemicals.

Laboratory use of hazardous chemicals means handling or use of such chemicals in which all of the following conditions are met:

(i) Chemical manipulations are carried out on a "laboratory scale;" (ii) Multiple chemical procedures or chemicals are used;
(iii) The procedures involved are not part of a production process, nor in any way simulate a production process; and

(iv) "Protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

Medical consultation means a consultation which takes place between an employee and a licensed physician for the purpose of determining what medical examinations or procedures, if any, are appropriate in cases where a significant exposure to a hazardous chemical may have taken place.

Mutagen means chemicals that cause permanent changes in the amount or structure of the genetic material in a cell. Chemicals classified as mutagens in accordance with the Hazard Communication Standard (§1910.1200) shall be considered mutagens for purposes of this section.

Physical hazard means a chemical that is classified as posing one of the following hazardous effects: Explosive; flammable (gases, aerosols, liquids, or solids); oxidizer (liquid, solid, or gas); self-reactive; pyrophoric (gas, liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; in contact with water emits flammable gas; or combustible dust. The criteria for determining whether a chemical is classified as a physical hazard are in appendix B of the Hazard Communication Standard (§1910.1200) and §1910.1200(c) (definitions of "combustible dust" and "pyrophoric gas").

Protective laboratory practices and equipment means those laboratory procedures, practices and equipment accepted by laboratory health and safety experts as effective, or that the employer can show to be effective, in minimizing the potential for employee exposure to hazardous chemicals.

Reproductive toxins mean chemicals that affect the reproductive capabilities including adverse effects on sexual function and fertility in adult males and females, as well as adverse effects on the development of the offspring. Chemicals classified as reproductive toxins in accordance with the Hazard Communication Standard (§1910.1200) shall be considered reproductive toxins for purposes of this section.

Select carcinogen means any substance which meets one of the following criteria: (i) It is regulated by OSHA as a carcinogen; or
(ii) It is listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or (iii) It is listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on
Cancer Monographs (IARC) (latest editions); or

(iv) It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:

(A) After inhalation exposure of 6–7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m^3;

(B) After repeated skin application of less than 300 (mg/kg of body weight) per week; or

(C) After oral dosages of less than 50 mg/kg of body weight per day.

1910.1450(c)

Permissible exposure limits. For laboratory uses of OSHA regulated substances, the employer shall assure that laboratory employees' exposures to such substances do not exceed the permissible exposure limits specified in 29 CFR part 1910, subpart Z.

1910.1450(d)

Employee exposure determination --

1910.1450(d)(1)

Initial monitoring. The employer 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).

1910.1450(d)(2)

Periodic monitoring. If the initial monitoring prescribed by paragraph (d)(1) of this section discloses employee exposure over the action level (or in the absence of an action level, the PEL), the employer shall immediately comply with the exposure monitoring provisions of the relevant standard.

1910.1450(d)(3)

Termination of monitoring. Monitoring may be terminated in accordance with the relevant standard.

1910.1450(d)(4)

Employee notification of monitoring results. The employer 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.

1910.1450(e)

Chemical hygiene plan -- General. (Appendix A of this section is non-mandatory but provides guidance to assist employers in the development of the Chemical Hygiene Plan).

1910.1450(e)(1)

Where hazardous chemicals as defined by this standard are used in the workplace, the employer shall develop and carry out the provisions of a written Chemical Hygiene Plan which is:

1910.1450(e)(1)(i)

Capable of protecting employees from health hazards associated with hazardous chemicals in that laboratory and

1910.1450(e)(1)(ii)

Capable of keeping exposures below the limits specified in paragraph (c) of this section.

1910.1450(e)(2)

The Chemical Hygiene Plan shall be readily available to employees, employee representatives and, upon request, to the Assistant Secretary.

1910.1450(e)(3)

The Chemical Hygiene Plan shall include each of the following elements and shall indicate specific measures that the employer will take to ensure laboratory employee protection;

1910.1450(e)(3)(i)

Standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals;

1910.1450(e)(3)(ii)

Criteria that the employer 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;

1910.1450(e)(3)(iii)

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;

1910.1450(e)(3)(iv)

Provisions for employee information and training as prescribed in paragraph (f) of this section;

1910.1450(e)(3)(v)

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;

1910.1450(e)(3)(vi)

Provisions for medical consultation and medical examinations in accordance with paragraph (g) of this section;

1910.1450(e)(3)(vii)

Designation of personnel responsible for implementation of the Chemical Hygiene Plan including the assignment of Departmental Chemical Hygiene Officers, and, if appropriate, establishment of a Chemical Safety Committee; and

1910.1450(e)(3)(viii)

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:

1910.1450(e)(3)(viii)(A)

Establishment of a designated area;

1910.1450(e)(3)(viii)(B)
Use of containment devices such as fume hoods or glove boxes;

1910.1450(e)(3)(viii)(C)
Procedures for safe removal of contaminated waste; and

1910.1450(e)(3)(viii)(D)
Decontamination procedures.

1910.1450(e)(4)

The employer shall review and evaluate the effectiveness of the Chemical Hygiene Plan at least annually and update it as necessary.

1910.1450(f)
Employee information and training.

1910.1450(f)(1)

The employer shall provide employees with information and training to ensure that they are apprised of the hazards of chemicals present in their work area.

1910.1450(f)(2)

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 employer.

1910.1450(f)(3)

Information. Employees shall be informed of:

1910.1450(f)(3)(i)

The contents of this standard and its appendices which shall be made available to employees;

1910.1450(f)(3)(ii)

the location and availability of the employer's Chemical Hygiene Plan;

1910.1450(f)(3)(iii)

The permissible exposure limits for OSHA regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable OSHA standard;

1910.1450(f)(3)(iv)

Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory; and

1910.1450(f)(3)(v)

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, safety data sheets received from the chemical supplier.

1910.1450(f)(4)
Training.

1910.1450(f)(4)(i)
Employee training shall include:

1910.1450(f)(4)(i)(A)
Methods and observations that may be used to detect the presence or release of a hazardous chemical (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

1910.1450(f)(4)(i)(B)
The physical and health hazards of chemicals in the work area; and

1910.1450(f)(4)(i)(C)

The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure

to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

1910.1450(f)(4)(ii)

The employee shall be trained on the applicable details of the employer's written Chemical Hygiene Plan.

1910.1450(g)
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.

1910.1450(h)
Hazard identification.

1910.1450(h)(1)
With respect to labels and safety data sheets:

1910.1450(h)(1)(i)

Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced.

1910.1450(h)(1)(ii)

Employers shall maintain any safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees.

1910.1450(h)(2)

The following provisions shall apply to chemical substances developed in the laboratory:

1910.1450(h)(2)(i)

If the composition of the chemical substance which is produced exclusively for the laboratory's use is known, the employer shall determine if it is a hazardous chemical as defined in paragraph (b) of this section. If the chemical is determined to be hazardous, the employer shall provide appropriate training as required under paragraph (f) of this section.

1910.1450(h)(2)(ii)

If the chemical produced is a byproduct whose composition is not known, the employer shall assume that the substance is hazardous and shall implement paragraph (e) of this section.

1910.1450(h)(2)(iii)
If the chemical substance is produced for another user outside of the laboratory, the employer shall comply with the Hazard Communication Standard (29 CFR 1910.1200) including the requirements for preparation of safety data sheets and labeling.

1910.1450(i)

Use of respirators. Where the use of respirators is necessary to maintain exposure below permissible exposure limits, the employer shall provide, at no cost to the employee, the proper respiratory equipment. Respirators shall be selected and used in accordance with the requirements of 29 CFR 1910.134.

1910.1450(j)
Recordkeeping.

1910.1450(j)(1)

The employer 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 this standard.

1910.1450(j)(2)

The employer shall assure that such records are kept, transferred, and made available in accordance with
29 CFR 1910.1020.

1910.1450(k)

[Reserved]

1910.1450(l)

Appendices. The information contained in the appendices is not intended, by itself, to create any additional obligations not otherwise imposed or to detract from any existing obligation.

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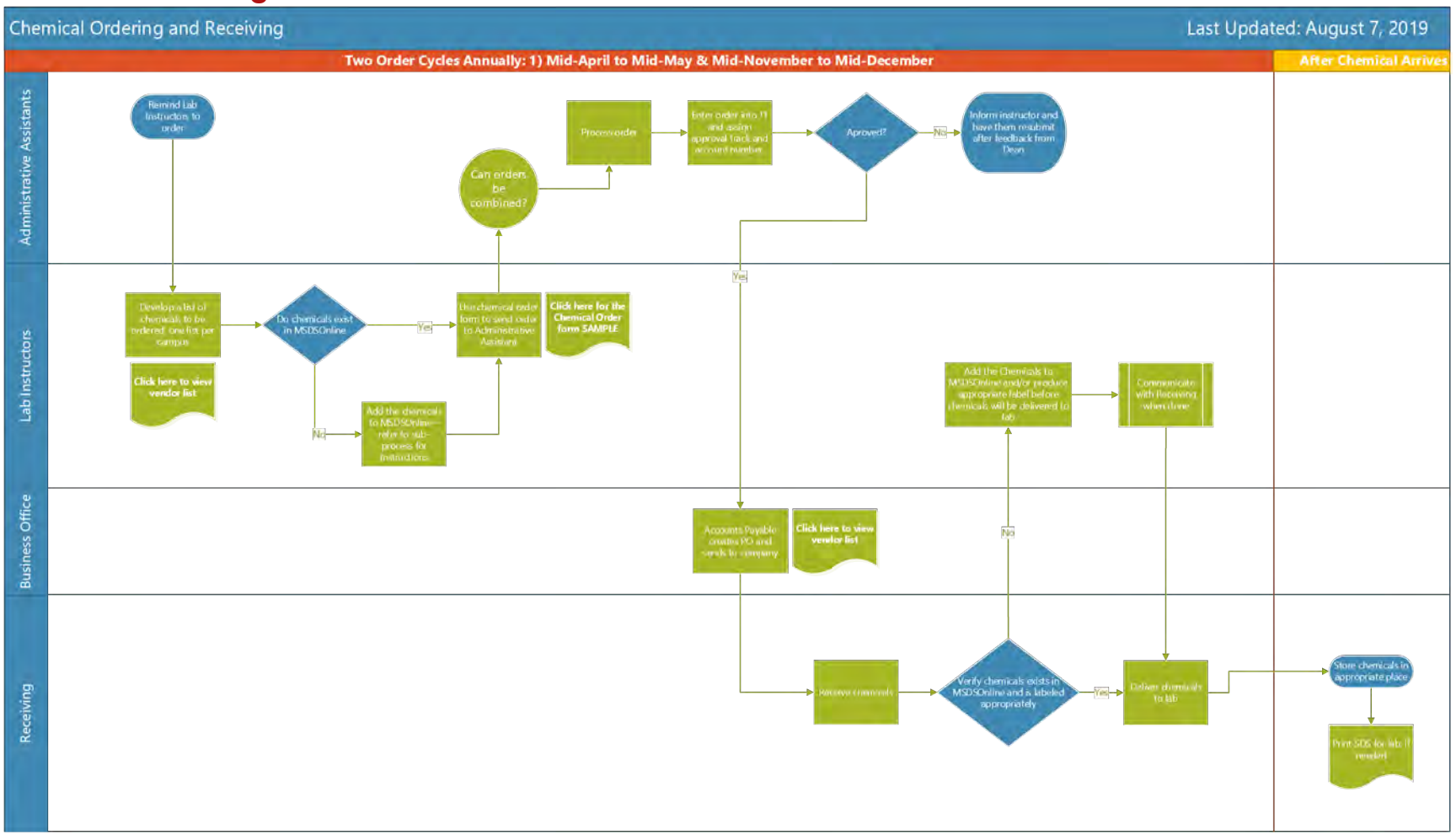
APPENDIX C

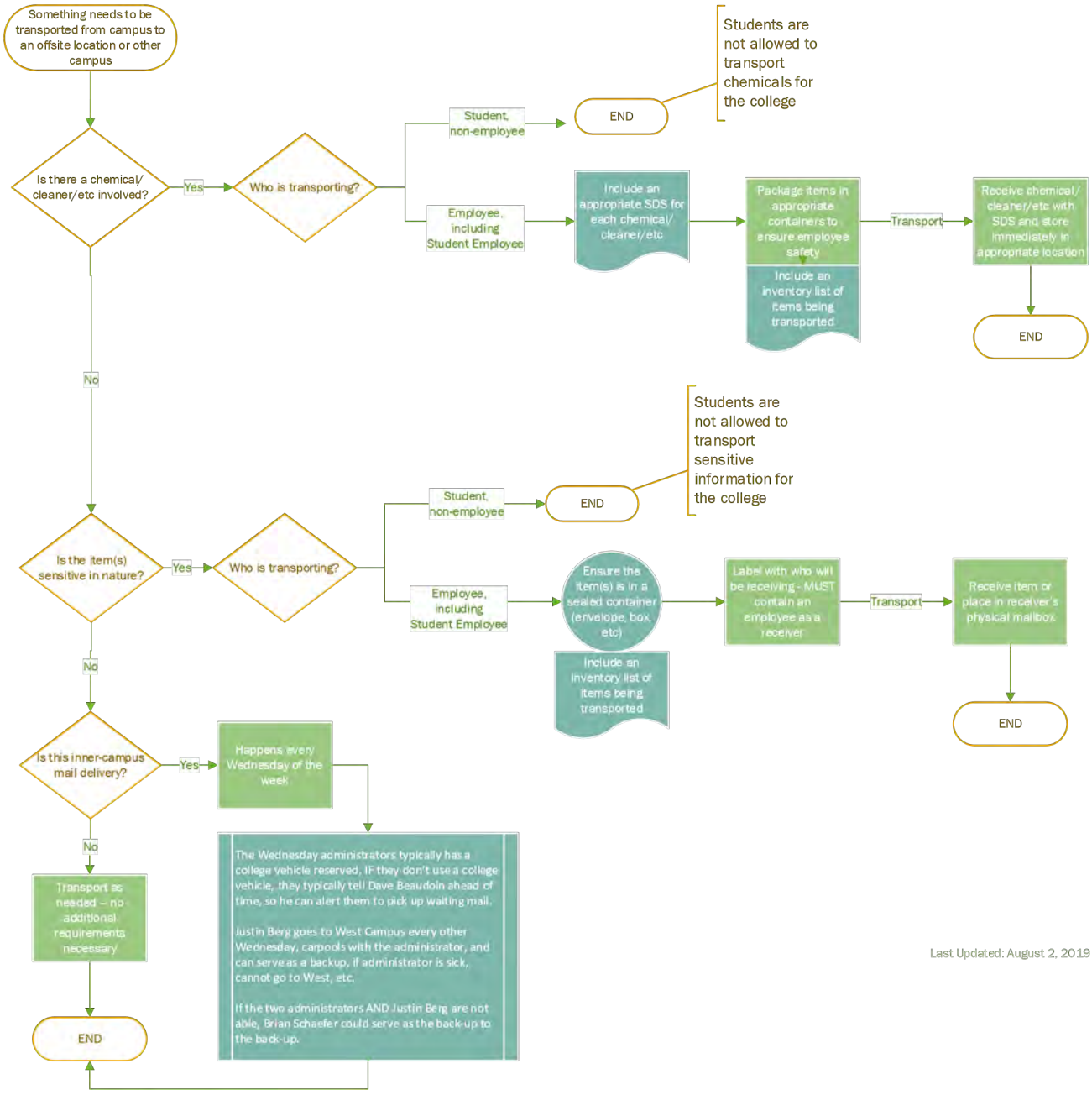
Chemical Ordering Procedure



APPENDIX D

Chemical Transport Protocol

Transportation Protocol


Something needs to be transported from campus to an offsite location or other campus
Is there a chemical/ cleaner/etc involved?
Yes
Who is transporting?
Student, non-employee
END
Students are not allowed to transport chemicals for the college
Employee, including Student Employee
Include an appropriate SDS for each chemical/ cleaner/etc
Package items in appropriate containers to ensure employee safety
Include an inventory list of items being transported
Transport
Receive chemical/ cleaner/etc with SDS and store immediately in appropriate location
END
No
Is the item(s) sensitive in nature?
Yes
Who is transporting?
Student, non-employee
END
Students are not allowed to transport sensitive information for the college
Employee, including Student Employee
Ensure the item(s) is in a sealed container (envelope, box, etc)
Include an inventory list of items being transported
Label with who will be receiving - MUST contain an employee as a receiver
Transport
Receive item or place in receiver's physical mailbox
END
No
Is this inner-campus mail delivery?
Yes
Happens every Wednesday of the week
The Wednesday administrators typically has a college vehicle reserved, IF they don't use a college vehicle, they typically tell Dave Beaudoin ahead of time, so he can alert them to pick up waiting mail.
Justin Berg goes to West Campus every other Wednesday, carpools with the administrator, and can serve as a backup, if administrator is sick, cannot go to West, etc.
If the two administrators AND Justin Berg are not able, Brian Schaefer could serve as the back-up to the back-up.
No
Transport as needed – no additional requirements necessary
END
Last Updated: August 2, 2019