CHEMICAL HYGIENE PLAN

Washington Administrative Code (WAC) 296-828, **Hazardous Chemicals in Laboratories**, AKA the "Laboratory Standard", requires each Washington State University (WSU) laboratory to implement a written Chemical Hygiene Plan (CHP) and designate a "Chemical Hygiene Officer" responsible for ensuring the laboratory adheres to the CHP. The CHP helps to protect employees from hazardous substances in the laboratory and maintain exposure levels below those listed in WAC 296-841, **Airborne Contaminants**.

WAC 296-828 outlines the CHP scope and requirements for all laboratories using hazardous chemicals. WSU Environmental Health and Safety (EH&S) has developed this CHP Guide to assist you with developing a CHP specific to your laboratory per WSU policy (**SPPM 4.12 Chemical Hygiene Plan for Laboratories**). Once complete, a CHP is unique to the laboratory for which it was created and cannot be shared. The CHP must be reviewed annually and updated as necessary.

Additionally, WSU's **Laboratory Safety Manual** (LSM) is available as a comprehensive online resource developed to assist you in identifying potential laboratory hazards. The information provided will help your laboratory run safely and efficiently. Please consult the LSM when needed as you complete your CHP.

In order to complete your laboratory specific Chemical Hygiene Plan, follow these steps:

- ✓ Complete the pages in this guide document to provide laboratory specific information, including designating individuals responsible for specific activities. Attach Standard Operating Procedures (SOPs) and reference other safety information such as your College or Department Accident Prevention Program (APP).

- ✓ Store a physical (paper) copy of the completed lab-specific CHP in an easily identified location in the laboratory. Remember, the CHP must be "readily available" for employees and may be requested by select visitors. Review and the update the CHP annually.

- ✓ Ensure that there is easy access to the most current version of WSU's LSM for everyone that works in or visits the laboratory. One way is to bookmark the electronic version of the LSM on the EH&S website: **https://ehs.wsu.edu/laboratory-safety-manual/**

- ✓ Employee training is required on your CHP and your laboratory specific procedures. This training must be documented, preferably within your CHP. An additional page has been added to this guide to assist you in documenting employee training completion.

If you have any questions regarding the CHP, laboratory safety or your initial laboratory set up, contact Tom Ebeling at 509-335-0948 or email **tom.ebeling@wsu.edu**. For general inquiries, call the EH&S main telephone number at 509-335-3041 or email **ehsweb@wsu.edu**.

Laboratory Identification

Principal Investigator (name):

Jane Anderson

Lab Supervisor/Manager (name), if applicable:

Brian Johnson

Department or Unit:

Chemistry

Building:

Butch T. Cougar Hall

Room(s):

134, 134A

PI Signature: **Date:**

Jane Anderson 5/1/2020

Responsibility for Chemical Hygiene and Safety

*WSU's **Laboratory Safety Manual section I.D.** provides information on laboratory safety responsibilities.*

Complete the following information for your Laboratory Specific Chemical Hygiene Plan by identifying a Chemical Hygiene Officer (CHO).

Person responsible for chemical hygiene and the Chemical Hygiene Plan in this laboratory (Principal Investigator, Faculty Member, or Supervisor/Laboratory Manager):

Jane Anderson	Principal Investigator
Name	**Title**

Building and Room(s)[1] covered by this plan:

Butch T. Cougar Hall, Rooms 134, 134A

Implementation Date: July 28 , 2017

Annual Review Dates:	**Approved By:**
July 25, 2018	Jane Anderson (PI)
July 27, 2019	Jane Anderson (PI)

[1] **The room(s) for which the Chemical Hygiene Plan is written must be adjoining rooms, a single room, or an area within a room as long as the Plan is accessible to all laboratory staff at any time, day or night.**

Chemical Inventory, Purchasing, Storage, and Dispensing

*WSU's **Laboratory Safety Manual section II.B** provides information on chemical inventories, purchasing, storage, and distribution.*

WSU laboratories may purchase hazardous chemicals through University Stores, which are distributed by Central Receiving. Hazardous chemicals should be carefully handled and stored when not in use.

Inventory:

Develop and implement an inventory control system to determine which chemicals are necessary to laboratory operation and which are not, reducing inventories of unneeded chemicals.

Update chemical inventories when new chemicals are procured, when chemical stocks are consumed, or old chemicals are removed from the laboratory. Generally, chemical inventories are updated at least annually.

Describe the location of your physical and/or digital chemical inventory system:
Digital inventory located on Dr. Anderson's Quartzy webpage. Physical copy of inventory located in CHP binder on shelf in main lab room 134.

Purchasing:

Chemicals delivered by University Stores will be delivered to (location):
Chemicals are delivered to departmental stockroom in the building's basement and obtained for laboratory use from there.

If chemicals are procured from vendors other than University Stores, then special provisions may apply. **If you will receive chemicals through an alternative method (following WSU Purchasing Policies), please describe it below**:

Not applicable

- Some chemicals may require prior approval from the department or other unit before their purchase due to specialized hazards, storage, use, or reporting requirements.
- NEVER accept a chemical without an adequate identifying label.

Person(s) who can accept or reject chemicals and other materials for this laboratory:

Brian Johnson	Laboratory Manager
Name	**Title**

List any chemical(s) that requires prior departmental and/or laboratory approval for purchase:

1) Not applicable

2)

3)

Storage:

A chemical storage system with easily identified areas should be maintained and arranged first by hazard classification followed by alphabetical order to prevent potential co-mingling of incompatible materials. Segregate acids and bases, oxidizers and flammable materials (organic and inorganic acids), and other incompatible materials.

Person(s) responsible for the storage of the chemicals for this laboratory:

Brian Johnson	Laboratory Manager
Name	**Title**

Dispensing:

Generally, chemicals are delivered to, dispensed from, and used within, the same laboratory.

If chemicals will be stored in another location and dispensed or picked up for use in the laboratory, **describe the locations of the storage and dispensing of the chemicals below:**

Chemicals are stored and dispensed in the main lab rooms 134 and 134A. Excess solvents are stored in flammable solvent storage room 139, shared by several labs.

Person(s) responsible for the transport and distribution of chemicals for this laboratory:

Brian Johnson	Laboratory Manager
Name	**Title**

Secondary Labeling System

*WSU's **Laboratory Safety Manual section II.H** provides information on labeling requirements.*

The **primary** labeling for chemical containers is the original manufacturers' labeling system attached to the container at the time of purchase or acquisition. It shall be readable (in English), maintained in good condition, and replaced if it becomes missing/damaged/unreadable.

Secondary containers filled from the primary chemical container require labels (in English) so that occupants will be aware of the contents of the container. In the event of an emergency, such as a chemical spill, clear legible labels will enable responders to take action more efficiently.

A container is something that contains a hazardous substance and must be labeled, such as:

- Barrel
- Bottle
- Bucket
- Can
- Cylinder
- Drum
- Reaction Vessel
- Storage Tank

Secondary containers are required to be labeled with the first two at the bare minimum:

- Chemical or common name spelled out (no abbreviations), including concentration/dilution
- Hazard warning (GHS, NFPA, HMIS system(s) or equivalent)
- *Recommended*: Date of transfer to container and initials of person who performed the transfer

***Alternative labeling systems are allowed if labeling the container itself is impractical or unreasonable (e.g. containers too small and numerous, such as test tubes/vials). Alternative methods include wire tags, labels attached to test tube racks, walls, shelves, etc. Abbreviations may be used if a poster with the full chemical name identifying chemical hazards associated with the abbreviation is prominently displayed.**

If an alternative method of container labeling is used, please describe it below:

Numerous samples are prepared daily in small test tubes and placed in test tube holder racks. Labels are placed on the racks to identify the contents of the vials instead of on the vials themselves.

The person(s) responsible for ensuring all labeling is completed in this laboratory:

Brian Johnson	Laboratory Manager
Name	**Title**
Jane Anderson	Principal Investigator
Name	**Title**
Name	**Title**

Safety Data Sheets (SDSs)

*WSU's **Laboratory Safety Manual section II.M** provides information on Safety Data Sheets.*

Safety Data Sheets are documents provided by chemical manufacturers describing the physical and health hazards and other information pertaining to hazardous chemicals (and trade name products) used in your laboratory. They must be accessible to all employees on all work shifts.

Location of current SDSs:

Online SDSs are located at the following web address:
http://www.fishersci.com/ or **https://www.sigmaaldrich.com/united-states.html**

Hard copies of SDSs are located in (building, room number, and description of binder):
SDS for chemicals used in lab are stored in binder in main lab room 134 next to CHP binder.
The department also maintains a server folder containing PDF copies of SDSs.

- Hard copy SDSs are not required, though it is necessary all laboratory employees know where digital copies are maintained and how to access them at all times.
- If you produce chemicals in the laboratory for users outside the laboratory, an SDS for the chemical will need to be created per WAC 296-901-14014, **Safety Data Sheets**. Contact EH&S for assistance.

The person(s) responsible for maintaining SDSs:

Brian Johnson	Laboratory Manager
Name	**Title**

SDSs for this laboratory may be obtained from:

Brian Johnson	Laboratory Manager
Name	**Title**

Standard Operating Procedures for Hazardous Substances

*WSU's **Laboratory Safety Manual section IV.C** provides direction on creating and documenting SOPs. EH&S makes **SOP Templates** available for use by WSU laboratories if needed.*

Standard Operating Procedures (SOPs) must be prepared for all procedures involving hazardous substances, defined as: *A chemical which 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; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard; or simple asphyxiate.* Laboratory specific procedures shall also be prepared identifying controls for physical hazards such as fire, explosion, over pressurization etc. if those hazard controls are not already identified in your Accident Prevention Program.

- SOPs are crucial in defining additional employee protection needed for select carcinogens, reproductive toxins, and chemicals with high degree of acute toxicity (formerly referred to as particularly hazardous substances). Additional protection includes exposure control areas, containment devices (fume hoods or glove boxes), and decontamination procedures.

- SOPs shall also include descriptions of circumstances when specific laboratory operation, activity, or procedure requires prior approval from the PI or their designated representative.

- SOPs for hazardous substances are considered part of the CHP and copies should be kept with the laboratory's CHP.

Describe where SOPs are stored:

Hardcopy SOPs are included and stored with this CHP in the binder in the main lab room 134.

Person responsible for developing and maintaining SOPs for this laboratory (Name and title):

Jane Anderson	Principal Investigator
Name	**Title**

Chemical Spill Information, Clean-Up, and Reporting

Chemical Spill Clean-Up By Employees:

Employees can clean-up minor chemical spills ONLY when all of the following conditions are met:

- The chemical is known and the spill can be cleaned-up in ten minutes or less.
- Employees are trained to safely clean-up chemical spills.
- Employees can wear the same personal protective equipment that they wear during normal work activities.
- Appropriate clean-up supplies are readily accessible.
- The chemical does not have a Ceiling Limit listed in **WAC 296-841** or can create an Immediate Danger to Life and Health (IDLH) atmosphere. IDLH information can be found in the **NIOSH Pocket Guide to Chemical Hazards**.
- Clean-up materials are disposed of per SPPM **5.66**.

*Chemical cleanup may be only conducted by trained personnel.

Training conducted by:

Jane Anderson	Principal Investigator
Name	**Title**

Instructions concerning specific chemical clean-up procedures are located in the Standard Operating Procedures for the chemical or provided during spill response training.

Person(s) Trained to Clean-up Spills (name and title):

Jane Anderson	Principal Investigator
Name	**Title**
Brian Johnson	Laboratory Manager
Name	**Title**
Dana Barrett	Research Assistant
Name	**Title**

Mercury Spills:

Employees cannot clean-up mercury spills. EH&S responds to all mercury releases. Call 509-335-3041 during business hours and 509-335-9000 after business hours.

When to Call 911:

If any of the above conditions cannot be met, then **immediately** evacuate all personnel from the area and call 911. Qualified emergency response personnel will respond to clean-up the spill.

Recommended Spill Clean-Up Kit:

Each laboratory should assemble a chemical spill clean-up kit consisting of:

- Personal protective equipment normally worn during routine work (e.g. gloves, safety goggles, lab coat)
- Absorbent pads
- One-gallon Ziploc bags
- Dust pan and brush
- Duct tape
- Five-gallon bucket with lid

The five-gallon bucket can be used to store spill clean-up materials and then can used to store contaminated items, such as gloves and absorbent pads, used during the clean-up. Once the spill is cleaned up, the bucket is to be closed and labeled as Dangerous Waste. Submit an on-line Chemical Collection Request (CCR) form at **http://forms.ehs.wsu.edu/Main.aspx** and EH&S will pick-up the container.

Location of Chemical Spill Kit:

In cabinet under main sink in lab bench in center of room 134. Cabinet door is labeled to indicate spill kit location.

Instructions for Re-stocking Chemical Spill Kit:

Contact EH&S at 509-335-3041.

***If applicable, describe alternate procedure:**

Not applicable.

Site Specific Ventilation Information

*WSU's **Laboratory Safety Manual section III.C** describes fume hood certification, general ventilation, and maintenance and repair requirements for WSU facilities.*

In order to protect employees and keep exposure levels below those in **WAC 296-841**, specific measures may need to be taken to ensure fume hoods and other protective equipment in your laboratory provide proper and adequate performance and are properly functioning.

Describe any additional ventilation requirements or usage in your laboratory (i.e. fume hood sashes must be left open at all times, snorkel procedures, clean benches procedures):

WSU Facilities Services tests fume hood face velocity annually, and certifies operation. The fume hood motor's operation is monitored via the building automation system (BAS). Should the motor malfunction, the malfunction will register at the Facilities Services control shop, and an electronic mail notification is sent to building coordinators and lab users via MyFacilities. A ChemWipe™ taped to the fume hood is also monitored by laboratory users as a visual (pulled inward) indicator of fume hood function.

There are two snorkel exhausts. One is located in room 134 and is used to collect vapors from a rotary evaporator. The other is located in room 134A and is used to vent a high temperature lab oven. Both snorkel systems should be placed as close to the lab equipment as possible without interfering with the operation of the equipment.

Regulated Hazardous Substances

*WSU's **Laboratory Safety Manual Appendix V.B** provides additional information on regulated hazardous substances that have specific rules.*

In addition to WAC 296-828, **Hazardous Chemicals in Laboratories**, some hazardous substances have their own individual rules which apply when using those substances in the workplace. If you use any of the substances listed in the table below, you should be familiar with the rule for that substance as they may contain additional provisions for employee exposure protection. Contact EH&S at 509-335-3041 for assistance.

Washington State Regulated Hazardous Substances	
• Acrylonitrile • Arsenic (inorganic) • Asbestos • Benzene • Butadiene • Cadmium • Coke ovens • Cotton dust • 1,2-Dibromo-3-chloropropane • Ethylene oxide • Formaldehyde • Hexavalent chromium • Lead • Methylene chloride • Methylenedianiline • Thiram	• Vinyl chloride • Ionizing radiation • 4-Nitrobiphenyl • Alpha-Naphthylamine • 4,4'-Methylene bis (2-chloroaniline) • Methyl chloromethyl ether • 3,3'-Dichlorobenzidine (and its salts) • Bis-chloromethyl ether • Beta-Naphthylamine benzidine • 4-Aminodiphenyl • Ethyleneimine • Beta-Propiolactone • 2-Acetylaminofluorene • 4-Dimethylaminoazobenzene • N-Nitrosodimethylamine

If you use any of the regulated substances in the table above, please list them here:

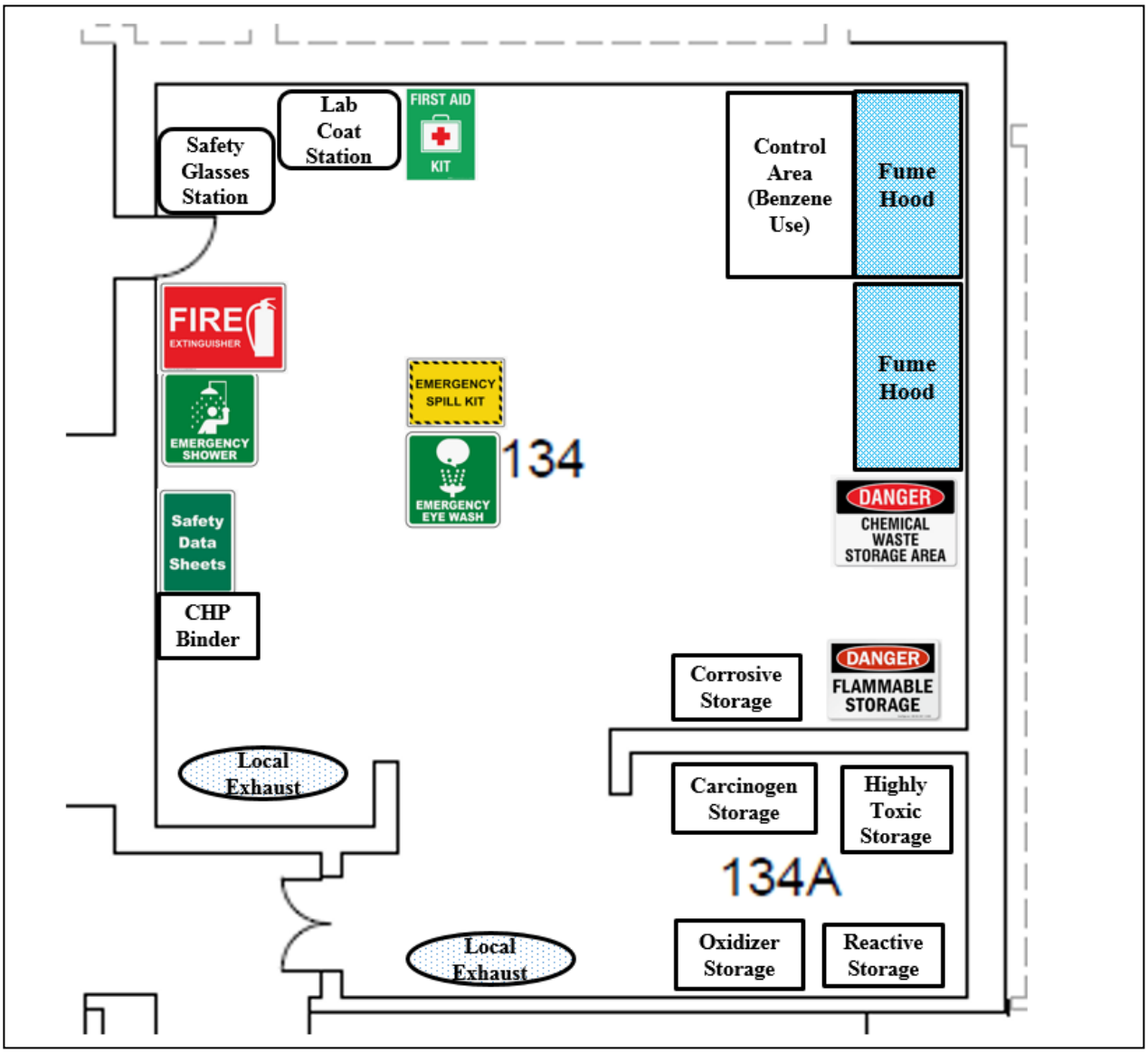
Small amounts of benzene are used in the fume hood occasionally. Employees have been trained on the contents of the rule for benzene (WAC 296-849). Initial monitoring of benzene usage by EH&S was below the permissible exposure limits (PELs). Benzene usage is confined to the control area made up of the fume hood in the northeast corner of room 134.

Floor Plan of Laboratory Layout

*WSU's **Laboratory Safety Manual section III.A** provides information on how to create a laboratory floor plan and provides an example. Additionally, EH&S can provide you with a scaled building plan section of your laboratory room(s) to help you create the floor plan in lieu of sketching it. Contact EH&S at 509-335-3041 for more information.*

Floor plans indicate the location of safety equipment and other features such as emergency washing facilities, first aid kits, fume hoods, biosafety cabinets, flammable storage cabinets, refrigerators, local exhaust units, fire extinguisher, control areas and hazardous substance storage and use areas.

Use the provided PowerPoint™ template and graphics to create your floor plan. Delete any of the graphics and/or text boxes representing features that don't apply to your laboratory.



Certificate of Employee Training

*WSU's **Laboratory Safety Manual section II.J** provides detailed information on employee training and the PI or Laboratory Supervisor's responsibilities.*

Name and title of person providing laboratory safety training:

Jane Anderson	Principal Investigator
Name	**Title**

Describe how employees are trained and informed about laboratory use of hazardous substances:

Employees are trained on the CHP, laboratory specific SOPs, the contents of WAC 296-828, and receive general laboratory safety training through HRS-provided online training modules. Hands on training is provided in handling hazardous substances safely initially and as needed.

The following employees have received laboratory safety training and reviewed the chemical hygiene plan for this laboratory:

Name of Employee:	**Date Trained:**
Brian Johnson	7/28/2017
Dana Barrett	5/22/2018