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LABORATORY PERSONAL PROTECTIVE EQUIPMENT (PPE) HAZARD ASSESSMENT GUIDE

Principal Investigator's (PI) Name (print name): Katharine Huntington	**Department/Unit:** Earth and Space Sciences	
Building(s): Johnson Hall (JHN)	**Room(s):** JHN 318	
Lab Manager's Name: N/A	**Lab Manager's Phone:**	
Completed by (print name):	**Signature:**	**Date**
Signature of PI:	**Date**	

This form must be completed by the PI, Lab Manager, or their designee. This person must conduct a laboratory hazard assessment specific to operations in their laboratories. The laboratory hazard assessment identifies hazards to employees and specifies personal protective equipment (PPE) to protect employees during work operations. The completed document and associated training will satisfy the Dept. of Labor & Industries requirements for PPE in WAC 296-800-160. EH&S personnel are available to assist you with completing this form or with reviewing it after you have completed it. EH&S may be consulted by calling EH&S at 206-543-7388. PIs/Lab Managers are responsible for ensuring PPE requirements are followed.

This Assessment Guide consists of two sections.

Section 1: Laboratory PPE Hazard Assessment
Section 2: Conduct PPE Training

Section 1: Laboratory PPE Hazard Assessment

In this section, the PI, Lab Manager or their designee will:

- Conduct a hazard assessment of the laboratory operations using the PPE Assessment guide. The guide will assist to identify operations when PPE is needed to protect lab staff from exposure to hazards. Describe the specific PPE your lab uses for each hazardous operation performed in your lab in the boxes you check off.
- Certify the hazard assessment for the laboratory by signing the table above after the PPE hazard assessment has been completed.

CHEMICAL HAZARDS **Minimum PPE: Lab coat, safety glasses, long pants or skirt, closed-toed shoes, disposable 4-mil nitrile gloves or appropriate chemical resistant gloves.** **Operations may need to be performed inside a fume hood.**				
(√) **If applies**	**Activity (Modify to fit your needs)**	**Potential Hazard**	**Check PPE Selected**	**Notes**
	Working with solids of low or moderate toxicity	Skin or eye damage; potential poisoning through skin contact	☐ Nitrile or other appropriate chemical-resistant glove ☐ List any other lab-specific-PPE	
	Working with very small volumes (<0.1L) of organic solvents, corrosives or other toxic liquids	Potential respiratory, skin, or eye damage; potential poisoning through skin contact	☐ Safety glasses ☐ Safety goggles where splashing may occur ☐ Nitrile or other chemical resistant gloves ☐ List any other lab-specific-PPE	
	Working with larger volumes (≥0.1L) of organic solvents, corrosives or other toxic liquids	Potential respiratory, skin, or eye damage; potential poisoning through skin contact	☐ Safety goggles ☐ Face shield and/or apron where splashing may occur ☐Nitrile or other chemical resistant gloves ☐ List any other lab-specific-PPE	
	Working with particularly hazardous agents or procedures such as: • Chemicals of high acute toxicity (e.g. hydrogen fluoride, hydrogen cyanide) • Human carcinogens, mutagens, and reproductive toxins • Select Agent toxins	Potential respiratory, skin, or eye damage; potential poisoning through skin contact.	☐ Refer to SOP ☐ Safety glasses ☐ Safety goggles where splashing may occur ☐ Chemical resistant gloves ☐ List any other lab-specific-PPE	
	Working with an apparatus with contents under pressure or vacuum _____ (mm of Hg, psi, or torr).	Eye or skin damage	☐ Goggles w/face shield- Use blast shield for high risk activities ☐ Chemical-resistant gloves / apron if chemicals are involved ☐ Refer to SOP	
	Working with air or water reactive chemicals	May give off toxic gases, heat, and energy. Potential inhalation, skin and eye damage, fire	☐ Work in inert atmosphere or inside glove box, where possible ☐ Goggles w/ face shield ☐ Chemical-resistant gloves ☐ Flame retardant lab coat ☐ Blast shield ☐ Refer to SOP	

CHEMICAL HAZARDS **Minimum PPE: Lab coat, safety glasses, long pants or skirt, closed-toed shoes, disposable 4-mil nitrile gloves or appropriate chemical resistant gloves.** **Operations may need to be performed inside a fume hood.**				
(√) If applies	**Activity (Modify to fit your needs)**	**Potential Hazard**	**Check PPE Selected**	**Notes**
	Working with pyrophoric materials	Fire, potential inhalation, skin and eye damage, severe burns	☐ Work in inert atmosphere or inside glove box ☐ Goggles w/ face shield ☐ Flame retardant lab coat and gloves with inner chemical-resistant gloves ☐ Wear non-synthetic clothing ☐ Refer to SOP	
	Working with potentially explosive chemicals	Detonation, flying debris, skin and eye damage, fire	☐ Safety goggles w/ face shield and blast shield ☐ Chemical resistant gloves ☐ Flame retardant lab coat ☐ Refer to SOP	
	Working with high temperature equipment or objects	Burns, fire	☐ Safety glasses ☐ Thermal insulated gloves	
	Working with cryogenic material	Burns, frostbite, eye damage	☐ Safety glasses w/ face shield ☐ Thermal insulated gloves	
√	Minor chemical spill cleanup	Potential skin, eye, respiratory damage	■ Safety glasses or goggles ■ Chemical-resistant gloves ☐ Chemical-resistant apron ■ Refer to SOP for additional PPE requirements Contact EH&S for assistance.	
√	Large chemical spill	Skin or eye damage, respiratory damage	Call 911. Report all injuries and fires. Call EH&S for assistance.	
	List any unique particularly hazardous lab tasks involving chemicals		☐ Refer to SOP ☐ List PPE required by the lab	

RADIOLOGICAL HAZARDS **Minimum PPE: Lab coat, long pants or equivalent, safety glasses, closed-toed shoes, disposable 4-mil nitrile gloves or appropriate chemical resistant gloves. Operations may need to be performed inside a fume hood.**				
(√) **If applies**	**Activity**	**Potential Hazard**	**Applicable PPE**	**N** **Notes**
	Working with solid radioactive material or solid radioactive waste	Cell damage, potential spread of radioactive contamination	☐ Safety glasses ☐ Impermeable gloves ☐ Lab coat ☐ Enclosed shoes ☐ Long pants- No shorts *Note: This PPE not needed when using sealed radiation sources.*	
	Working with liquid radioactive material (in corrosives, flammables, aqueous liquids – including liquid radioactive waste) or radioactive powders	Cell damage or spread of contamination, plus hazards for the specific chemical	☐ Safety glasses (or goggles for splash hazard) ☐ Impermeable gloves ☐ Lab coat ☐ Enclosed shoes ☐ Long pants- No shorts *Note: Select glove type for the applicable chemical hazards.*	
	Working with ultraviolet radiation	Conjunctivitis, corneal damage, skin burns	☐ UV face shield and/or goggles ☐ Lab coat ☐ Nitrile gloves if hand exposure is possible	
	Working with infrared-emitting equipment (e.g., glass blowing)	Cataracts, burns to cornea	☐ Appropriate polycarbonate infrared filter glasses ☐ Lab coat	
NANOMATERIALS **Minimum PPE: Lab coat, long pants or equivalent, safety glasses, closed-toed shoes, disposable 4-mil nitrile gloves or appropriate impermeable glove. Work inside a fume hood or HEPA filtered vented enclosure.**				
(√) **If applies**	**Activity (Modify to fit your needs)**	**Potential Hazard**	**Additional Recommended PPE**	**NNN** **Notes**
	Working with engineered nanomaterials	Inhalation, chemical exposure, dermal exposure	☐ Use P100 dust respirators if working outside a vented enclosure ☐ Nitrile gloves ☐ Review Guidelines for Handling Nanomaterials	

LASER HAZARDS Minimum PPE: Lab coat, long pants or equivalent, safety glasses, closed-toed shoes, disposable 4-mil nitrile gloves or appropriate chemical resistant gloves.				
(√) If applies	Activity	Potential Hazard	Applicable PPE	Notes
	OPEN BEAM			
	Performing beam alignment, laser experiment, troubleshooting or maintenance that requires working with an open laser beam, and/or defeating the interlock(s) on any Class 3b or Class 4 laser system	Eye damage	☐ Appropriate laser safety goggles/glasses with optical density based on individual beam parameters *EH&S to determine the needed optical density.*	
	Viewing a Class 3R laser beam *with magnifying optics* (including eyeglasses)	Eye damage	☐ Appropriate laser safety goggles/glasses with optical density based on individual beam parameters *EH&S to determine the needed optical density.*	
	Working with a Class 3b open beam laser system with the potential for producing direct or specular (mirror-like) reflections	Eye damage	☐ Appropriately shaded goggles/glasses with optical density based on individual beam parameters *EH&S to determine the needed optical density.*	
	Working with a Class 4 open beam laser system with the potential for producing direct, specular, or diffuse reflections	Eye damage, skin damage	☐ Appropriate laser safety goggles/glasses with optical density based on individual beam parameters *EH&S to determine the needed optical density.* ☐ Long sleeved shirt (tightly wound fabric) ☐ Lab coat ☐ Nitrile gloves	
	NON-BEAM			
	Handling dye laser materials, such as powdered dyes, chemicals, and solvents	Cancer, explosion, fire	☐ Impermeable gloves ☐ Safety glasses ☐ Flame-resistant lab coat or coveralls	
	Maintaining and repairing power sources for Class 3B and Class 4 laser systems	Electrocution, explosion, fire	☐ Electrical isolation mat ☐ Flame-resistant lab coat ☐ Insulated gloves ☐ Safety glasses ☐ Coveralls ☐ Implement Lockout/Tagout procedures ☐ Refer to SOP Contact EH&S for assistance.	
PHYSICAL HAZARDS **Minimum PPE: Lab coat, long pants or equivalent, safety glasses, closed-toed shoes, disposable 4-mil nitrile gloves.**				
(√) If applies	Activity (Modify to fit your needs)	Potential Hazard	Additional Recommended PPE	Notes
	Working with cryogenic liquids	Major skin, tissue, or eye damage	☐ Goggles and face shield ☐ Cryogenic or loose fitting heavy leather gloves ☐ Cryogenic apron	

	Removing freezer cryovials from liquid nitrogen	Vials may explode upon rapid warming, cuts to face/neck and frostbite to hands	☐ Safety glasses or goggles and face shield ☐ Cryogenic or loose fitting heavy leather gloves	
	Working with very cold equipment or dry ice	Frostbite, hypothermia	☐Safety glasses ☐ Cryogenic or heavy leather gloves (possibly warm clothing)	
	Working with hot liquids, heating equipment, open flames (autoclave, Bunsen burner, water bath, oil bath)	Burns resulting in skin or eye damage	☐Safety glasses ☐ Goggles for hot liquids ☐ Autoclave gloves (impermeable insulated gloves for liquids, steam)	
	Glassware washing	Lacerations	☐Safety glasses ☐ Cut resistant gloves	
	Working with loud equipment, noises, sounds, alarms, etc.	Potential ear damage and hearing loss	☐ Earplugs or ear muffs as necessary ☐Contact EH&S for noise exposure assessment	
	Working with a centrifuge	Imbalanced rotor can lead to broken vials, cuts, potential exposure to aerosols.	☐ Centrifuge rotor should be opened inside fume hood or biosafety cabinet if potential for broken vials exists ☐ Goggles ☐ Appropriate gloves	
	Working with a sonicator	Ear damage, exposure to aerosols	☐ Place inside fume hood or biosafety cabinet to capture aerosols ☐ Goggles ☐ Impermeable gloves	
	Working with sharps	Cuts, exposure to aerosols	☐ Use tongs for broken glass and designated sharps container for contaminated wastes ☐ Cut resistant gloves (Kevlar) with nitrile underneath	
	Working with compressed gases inside environmental chambers	Asphyxiation or toxic gas exposure	NOT ALLOWED. Contact EH&S for guidance. Review SOP and install oxygen sensors inside chamber.	

BIOLOGICAL HAZARDS **Minimum PPE: Lab coat, closed-toed shoes, disposable 4-mil nitrile gloves.**				
(√) **If applies**	**Activity (Modify to fit your needs)**	**Potential Hazard**	**Additional Recommended PPE**	**Notes**
	Working with human blood, body fluids, cell lines (primary or established), tissues, or blood borne pathogens (BBP)	Exposure to infectious material	☐ Perform inside a Biosafety cabinet (BSC) ☐ Latex or nitrile gloves ☐ Lab coat or gown	
	Working with preserved animal and/or human specimens	Exposure to infectious material or preservatives	☐ Perform in a BSC ☐ Safety glasses required if performed outside of a BSC ☐ Impermeable glove for preserved specimens according to preservative used ☐ Lab coat ☐ Disposable gown	

BIOLOGICAL HAZARDS Minimum PPE: Lab coat, closed-toed shoes, disposable 4-mil nitrile gloves.				
(√) If applies	Activity (Modify to fit your needs)	Potential Hazard	Additional Recommended PPE	Notes
	Working with radioactive human blood, body fluids, or blood borne pathogens (BBP)	Cell damage, potential spread of radioactive contaminants, or potential BBP exposure to infectious material	☐ Perform in a BSC ☐ Latex or nitrile gloves ☐ Lab coat ☐ Gown	
	Working with agents or recombinant DNA classified as Risk Group 1 and requiring Biosafety Level 1 containment	Biological agents that typically pose a minimal potential for infection via injection, skin exposure, ingestion or inhalation	☐ Safety glasses or goggles for protection from splash or other eye hazard ☐ Latex or nitrile gloves ☐ Lab coat ☐ Disposable gown	
	Manipulation of recombinant DNA, cell lines, viruses, bacteria, or other organisms classified as Risk Group 2 and requiring Biosafety Level 2 (BSL-2)	Biological agents that pose a moderate potential for infection via injection, skin exposure, ingestion or inhalation	☐ Perform in a BSC ☐ Latex or nitrile gloves ☐ Lab coat ☐ Surgical gown	
	Manipulation of infectious materials classified as Risk Group3 but manipulated in a BSL 2 facility with BSL-3 practices (BSL 2+)	Biological agents that pose a moderate/serious potential for infection via injection, skin exposure, ingestion, or inhalation	☐ Safety glasses or goggles for protection from splash or other eye hazard ☐ Nitrile gloves (double) ☐ Lab coat ☐ Disposable gown (preferred) that ties in the back ☐ Respirator if indicated	
	Manipulation of infectious materials classified as Risk Group 3 and requiring Biosafety Level 3 (BLS-3) containment	Biological agents that pose a serious or lethal potential for infection via injection, skin exposure, ingestion or inhalation	☐ Safety glasses or goggles for protection from splash or other eye hazard ☐ Nitrile gloves (double) ☐ Full disposable coverall suit (preferred) ☐ Respirator ☐ Shoe cover or dedicated shoe	

BIOLOGICAL HAZARDS Minimum PPE: Lab coat, closed-toed shoes, disposable 4-mil nitrile gloves.				
(√) If applies	Activity (Modify to fit your needs)	Potential Hazard	Additional Recommended PPE	Notes
	Working with live animals (Animal Biosafety Level 1, ABL-1)	Animal bites, allergies	☐ Safety glasses or goggles for protection from splash or other eye hazard ☐ Nitrile or vinyl gloves for broken skin ☐ Lab coat or gown ☐ Consider need for wire mesh or Kevlar glove	
	Working with live animals (Animal Biosafety Level 2, ABL-2)	Animal bites, exposure to infectious material, allergies	☐ Safety glasses or goggles for protection from splash or other eye hazard ☐ Nitrile or vinyl gloves ☐ Disposable gown ☐ Shoe covers ☐ Consider need for wire mesh or Kevlar glove	
	Working with live animals (Animal Biosafety Level 2+, ABL-2+)	Animal bites, exposure to infectious material, allergies	☐ Safety glasses or goggles for protection from splash or other eye hazard ☐ Nitrile or vinyl gloves ☐ Disposable gown ☐ Shoe covers ☐ N-95 respirator as indicated ☐ Consider need for wire mesh or Kevlar glove	
	Working with live animals (Animal Biosafety Level 3, ABL-3)	Animal bites, exposure to infectious material, allergies	☐ Safety glasses or goggles for protection from splash or other eye hazard ☐ Nitrile or vinyl gloves ☐ Disposable gown ☐ Shoe covers ☐ Respirator (N-95 or PAPR) ☐ Consider need for wire mesh glove	

Additional Guidance

1. When materials have a potential for becoming airborne, use a chemical fume hood or other engineering control whenever possible. Activities, with a potential to generate airborne contaminants, not conducted inside a chemical fume hood or with another engineering control (such as a local exhaust at the workbench) should be evaluated to determine if the activity presents a respiratory hazard. In this case a respirator may be required and a respiratory protection program must be in place per EH&S. Guidance can be found *here.*

2. Chemical-resistant gloves are to be selected based on the specific chemical(s) used and manufacturer's glove permeation and compatibility charts. (Provide link)

3. All PPE must be inspected prior to use, during, and after use. Re-usable equipment must be decontaminated or disposed if not feasible.

4. Use a biosafety cabinet to minimize exposure. Activities that cannot be conducted inside biosafety cabinet should be separately evaluated by the EH&S Biosafety Office. For BSL-3 or ABL-3 activities, the PPE requirements will be addressed by the BSL-3 facility.

Section 2: Conduct PPE Training

PPE training consists of **lab specific training** conducted by the lab manager or PI. Documentation is required to indicate training has been conducted.

Step 1
The PI or lab manager assures that the employees have completed all applicable safety training courses.

Step 2

a. The PI, lab manager, or their designee reviews the **completed Lab PPE Hazard Assessment Guide** (this document) with the employee. It describes the operations in the lab where employees need PPE to protect themselves from exposure to hazards. In this step, the hazard assessment is used as a training tool.
b. While discussing lab operations and the associated hazards with lab staff, the manager will address how their lab obtains PPE, what types of PPE are used in the lab and for which tasks, where and how the PPE is stored and maintained, how to properly use the PPE, and discuss any limitations of the PPE. The manager should also discuss general PPE safety practices, including not wearing PPE outside of lab hazard areas (e.g. hallways and eating areas).
c. Each research staff will sign below acknowledging that they have reviewed the PPE assessment tool.

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Step 3
Conduct and document refresher training whenever the hazard assessment is updated.

PPE Hazard Assessment Tool Training Acknowledgement:
I have read, asked questions, and understand the PPE requirements for the activity/materials described herein.

Trainer's Name (print)	Trainer's Name (signature)	Trainees Name (print)	Trainees Name (signature)	Date