Purpose: To define minimum standards for personal protective equipment (PPE) when working with research animals at the University of Michigan for the purpose of preventing or controlling personnel exposure to zoonotic organisms and allergens inherent in the animals. Additional PPE may be required to protect personnel from additional hazards that may be encountered in the research setting, including the following: chemicals, toxins, infectious organisms, or radioactive materials purposefully administered to animals in an approved animal use protocol; physical, chemical or noise hazards present in cage wash facilities or diagnostic laboratories; and hazards associated with field research or wild caught animals. PPE required for use in these settings must be determined after consultation with the Department of Environment, Health and Safety (EHS). Contact EHS Biological Safety at 647-1143 for additional information. Use of additional PPE may be required by ULAM to help protect the health of the animals or humans. Personnel with compromised immune systems or who are pregnant may need additional protections as required by a physician or occupational health specialist. EHS and UM-Occupational Health Services will evaluate potential risks and make recommendations for individuals upon request.

Note - Animal care personnel should be aware that exposure to infectious and/or hazardous materials can occur through cuts/punctures with contaminated sharp objects, blood or other potentially infectious materials entering a break in the skin, splashes to the eyes, nose or mouth. The proper use of standard personal protective equipment will significantly reduce the risk of exposure to potentially hazardous materials. If employees have an open cut, wound or skin abrasion, cover the affected area with a bandage or other type of waterproof dressing and wear double gloves to prevent transmission through breaks in the skin before entering the space. Any exposure incidents should be reported immediately to the area supervisor and complete the Work Connections Illness or Injury Report Form. Treatment and counseling following such an incident is available through Occupational Health Services (734-764-8021).

This PPE chart does not cover the requirements for containment rooms. Please refer to the ULAM SOP, Animals Administered a Hazardous Substance Requiring Containment, for the specific requirements for those rooms.
Responsibilities:

1. It is the responsibility of the Principal Investigator to ensure that laboratory staff members are trained in the appropriate use of PPE when working with animals or tissues in research and that their staff appropriately utilize the required PPE.

2. It is the responsibility of EHS to periodically reassess potential risks within the animal facility that could be mitigated by use of PPE and amend PPE requirements as needed.

3. It is the responsibility of EHS to perform a risk assessment and determine the appropriate PPE for use in situations for which this policy does not apply (e.g., for pregnant or immunocompromised personnel).

4. It is the responsibility of the management of each animal facility to ensure the signage detailing required PPE is clearly visible to all facility users and that all users are monitored for appropriate PPE use.

For questions regarding this document, please contact EHS at 647-1143.

Definitions:

Animal body substances – tissues or fluids of animal origin (e.g., urine, feces, blood, saliva).

Dedicated clothing- a garment (e.g., scrubs or laboratory coat) worn only in the animal facility or research laboratory but not in general public areas. These garments must not leave the workplace and must be laundered and stored in the workplace.

Face Mask- covering for the mouth or face that supplies splash and gross debris protection (should be water resistant), but is not intended to provide respiratory filtration (see EHS approved respirator).

Fixed tissue - tissues processed with a chemical substance (e.g., formalin, formaldehyde, gluteraldehyde) known to inactivate select biological hazards.

In-room observation – visual observation of an animal within a room (e.g., housing room, procedure room, behavioral suite) of the animal facility that does not include touching of the animal or, when applicable, opening of a microisolation cage.

Personal Protective Equipment- protective coverings (e.g., clothing, gloves, hair covers, goggles, mask) designed to protect the wearer’s body from exposure to infectious agents or allergens associated with animals.

EHS Approved Respirator- NIOSH certified N-95 or higher particulate respirator or positive air purifying respirator (PAPR).

Sealed eye protection- goggles with closed top, side, and bottom and indirect vents that fit snugly against the face forming a seal around the eyes, thus preventing liquids from splashing or dripping into the eyes. Goggles must meet standards described in 29 CFR 1910.133 Eye and Face Protection and ANSI Z87.1 -1989.

Sheep with increased risk of Q Fever- Q fever is a zoonotic disease caused by Coxiella burnetii. Pregnant female sheep, newborn or nursing lambs can shed high levels of the organism in the placental membrane, birthing fluids, milk, feces and urine.
Attachment: Minimum PPE for Animal Handlers

1) Minimum required PPE for mammalian/avian species: *Dedicated outer-covering or disposable outer-covering with long sleeves, disposable gloves, closed-toed shoes, and long pants or equivalent leg covering.*

2) Refer to Table 1 and Table 2 for additional PPE based on species and tasks.

3) Always consult room specific PPE requirements posted at the entrance.

Table 1

<table>
<thead>
<tr>
<th>Tasks or Animals Involved</th>
<th>Direct contact with animals (including post mortem examination of animals “necropsy”)</th>
<th>Contact with animal caging, bedding or equipment</th>
<th>In room observation only</th>
<th>Handling or processing animal body substances or unfixed tissues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working with Rodents and Rabbits</td>
<td>No additional PPE</td>
<td>EHS approved respirator <em>(only for husbandry and dirty cage wash staff changing/dumping cages w/out engineering controls)</em></td>
<td>No additional PPE</td>
<td>No additional PPE</td>
</tr>
<tr>
<td>Carnivores (Dogs, Cats, Ferrets)</td>
<td>Waterproof shoe covers or waterproof dedicated shoes</td>
<td>Waterproof shoe covers or waterproof dedicated shoes <em>(only required when in the animal room &amp; dirty cage wash)</em></td>
<td>Waterproof shoe covers or waterproof dedicated shoes</td>
<td>No additional PPE</td>
</tr>
<tr>
<td>Cattle, Pigs, Goats, and Sheep in a Research Building (See Table 2 below for Sheep with Orf lesions and/or increased risk for Q fever transmission)</td>
<td>Waterproof shoe covers or waterproof dedicated shoes</td>
<td>Waterproof shoe covers or waterproof dedicated shoes <em>(only required when in the animal room &amp; dirty cage wash)</em></td>
<td>Waterproof shoe covers or waterproof dedicated shoes</td>
<td>No additional PPE</td>
</tr>
<tr>
<td>Non-Human Primates:</td>
<td>• Sealed eye protection</td>
<td>• Sealed eye protection</td>
<td>• Sealed eye protection</td>
<td>• Sealed eye protection</td>
</tr>
<tr>
<td></td>
<td>• 2 layers of disposable gloves</td>
<td>• 2 layers of disposable gloves</td>
<td>• 2 layers of disposable gloves</td>
<td>• 2 layers of disposable gloves</td>
</tr>
<tr>
<td></td>
<td>• Surgical mask or EHS approved respirator <em>(for procedures producing aerosols/particles)</em></td>
<td>• EHS approved respirator</td>
<td>• Surgical mask</td>
<td>• Surgical mask</td>
</tr>
<tr>
<td></td>
<td>• Waterproof shoe covers or waterproof dedicated shoes</td>
<td>• Waterproof shoe covers or waterproof dedicated shoes <em>(only required when in the animal room &amp; dirty cage wash)</em></td>
<td>• Waterproof shoe covers or waterproof dedicated shoes</td>
<td>• Waterproof shoe covers or waterproof dedicated shoes</td>
</tr>
<tr>
<td></td>
<td>• Hair bonnet</td>
<td>• Hair bonnet</td>
<td>• Hair bonnet</td>
<td>• Hair bonnet</td>
</tr>
<tr>
<td>Birds</td>
<td>Shoe covers or dedicated shoes</td>
<td>Shoe covers or dedicated shoes <em>(only required when in the animal room &amp; dirty cage wash)</em></td>
<td>Shoe covers or dedicated shoes</td>
<td>No additional PPE</td>
</tr>
</tbody>
</table>

*Table 2*

- For Sheep with Orf lesions:
  - Waterproof shoe covers or waterproof dedicated shoes *(only required when in the animal room & dirty cage wash)*
  - Sealed eye protection
  - 2 layers of disposable gloves
  - Surgical mask
  - EHS approved respirator
  - Temporary work area at least 6' away from research space

*For Q fever transmission:
- Waterproof shoe covers or waterproof dedicated shoes *(only required when in the animal room & dirty cage wash)*
- Sealed eye protection
- 2 layers of disposable gloves
- Surgical mask
- EHS approved respirator
- Temporary work area at least 6’ away from research space
<table>
<thead>
<tr>
<th>Tasks or Animals Involved</th>
<th>Direct contact with animals (including post mortem examination of animals “necropsy”)</th>
<th>Contact with animal caging, bedding or equipment</th>
<th>In room observation only</th>
<th>Handling or processing animal body substances or unfixed tissues</th>
</tr>
</thead>
</table>
| **Sheep with ORF Lesions in a Research Building** | • Water-resistant jumpsuit/coverall that covers entire body and arms that is either discarded after each use or sterilized  
• Surgical mask (recommended)  
• Eye protection  
• Waterproof shoe covers or waterproof dedicated shoes | • Water-resistant jumpsuit/coverall that covers entire body and arms that is either discarded after each use or sterilized  
• Waterproof shoe covers or waterproof dedicated shoes *(only required when in the animal room & dirty cage wash)* | • Dedicated outer-covering or disposable outer-covering with long sleeves can be worn in place of water resistant gown  
• Waterproof shoe covers or waterproof dedicated shoes | • Dedicated outer-covering or disposable outer-covering with long sleeves can be worn in place of water resistant gown |
| **Working with Sheep with Increased Risk of Q fever Transmission in a Research Building** | • Water-resistant jumpsuit/coverall that covers entire body and arms that is either discarded after each use or sterilized  
• EHS approved respirator  
• Waterproof shoe covers or waterproof dedicated shoes  
• Hair bonnet  
• Sealed eye protection | • Water-resistant jumpsuit/coverall that covers entire body and arms that is either discarded after each use or sterilized  
• EHS approved respirator  
• Waterproof shoe covers or waterproof dedicated shoes *(only required when in the animal room & dirty cage wash)*  
• Hair bonnet  
• Sealed eye protection | | • Water-resistant jumpsuit/coverall that covers entire body and arms that is either discarded after each use or sterilized  
• EHS approved respirator  
• Hair bonnet  
• Eye protection |
1) Minimum required PPE for Amphibian, Reptile, Aquatics: **Disposable gloves**
2) Refer to Table 3 for additional PPE requirements based on species and task
3) Always consult room specific PPE requirements posted at the entrance

<table>
<thead>
<tr>
<th>Tasks or Animals Involved</th>
<th>Direct contact with animals (including post mortem examination of animals “necropsy”)</th>
<th>Contact with animal caging, bedding or equipment</th>
<th>In room observation only</th>
<th>Handling or processing animal body substances or unfixed tissues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrestrial Amphibians and Reptiles</td>
<td>No additional PPE</td>
<td>No additional PPE</td>
<td>No PPE required</td>
<td>No additional PPE</td>
</tr>
<tr>
<td>Aquatic Amphibians, Reptiles, and Fish</td>
<td>Disposable gloves of suitable length to prevent skin contacting water</td>
<td>Disposable gloves of suitable length to prevent skin contacting water</td>
<td>No PPE Required</td>
<td>No additional PPE</td>
</tr>
</tbody>
</table>
Minimum Required PPE for Working with Sheep in a Farm Setting

General work in sheep corals, pens, pastures with No Animal Contact at all times of the year:

- Dedicated shoes or shoe coverings (for farm use only)
- During non-birthing season, street clothes may be worn in the animal areas

Cleaning of sheep areas with No Animal Contact:

- Dedicated shoes or waterproof shoe coverings
- Disposable gloves
- Clothing that is only worn while working with the sheep and is washed at the farm
- EHS approved respirator (Recommended) – minimize aerosols

Any direct contact with Sheep (e.g. dyeing wool, shearing, blood collection):

- Dedicated shoes or waterproof shoe coverings
- Disposable gloves
- Clothing that is only worn while working with the sheep and is washed at the farm
- EHS approved respirator (Recommended) – minimize aerosols

Any direct contact with sheep with ORF lesions:

- Dedicated outer-covering or disposable outer-covering with long sleeves
- Disposable gloves
- Waterproof dedicated shoes or waterproof shoe covers
- Eye protection
- Surgical mask (recommended)

Contact with newly parturient ewe, newborn lamb (less than 48 hours old) and/or fetal tissues during surgery or necropsy:

Contact with ewe during parturition, fetal tissues, placenta or other birth products, newborn lambs (less than 48 hours old), aborted fetus, waste material from these animals including bedding:

Direct contact with birth fluids or milk products (see note 2 below)

- NOTE (1): This level of protection must be used until ALL ewes are done birthing and the remains of the birth products and bedding have been removed
- Water-resistant jumpsuit/cover-all with hood or separate head covering - the suit must be discarded after each use or sterilized
- Sealed eye protection
- EHS approved respirator
- Disposable gloves
- Dedicated shoes or waterproof shoe coverings

Note 2: Birth fluids or milk products can contain orf virus.
Sheep with an increased risk of Q fever transmission include infected pregnant ewes.

- **NOTE (2):** There may be high levels of pathogenic organisms in these animal tissues at the time that they give birth, so particular care needs to be used in handling newborn (48 hours old) animals, placental or fetal tissues and other products of conception.

- For additional information on working with sheep with ORF lesions or increased risk of Q fever transmission refer to the ULAM SOP: Procedures to Reduce Human Exposure to Orf (Contagious Ecthyma) and Q Fever (*Coxiella burnetii*)

- Additional Q Fever precautions:
  - It is recommended that individuals with a history of heart conditions, women who are pregnant or individuals considered to have a higher risk for a severe outcome should wear full PPE covering (EHS approved respirator, sealed eye protection, dedicated shoes or waterproof shoe coverings and head covering) throughout the period of late pregnancy, parturition and lactation while in the corals or barns, whether in physical contact with the animals or not. The level of PPE can be reduced, as indicated above, upon removal and disposal of animal products (e.g., birth products, urine, feces, bedding, or milk) and the area has been thoroughly cleaned.
  - Dedicated shoes or waterproof shoe coverings will be supplied at the farm. Following use, dedicated shoes must be rinsed off and disinfected by spraying with bleach or Lysol solution while outside, and then placed back in the storage area inside the dedicated area. Disposable shoe covers must not be reused. Respiratory protection must be worn while rinsing of dedicated shoes.
  - All protective clothes worn on the farm during the period when ewes are giving birth should be washed at the farm. If clothing or surgical drapes used on pregnant animals are not placed immediately into the washer, they should be stored in a biohazard bag/container until ready for washing. The person unloading the biohazard bag/container should wear dedicated protective outer covering, disposable gloves, and an EHS approved respirator.
  - Disposable suits are meant for a one-time use, unless the suits are autoclaved. If the expectation is to re-use these suits, they must be autoclaved prior to re-use. No more than 3 cycles of autoclaving can be performed before the suits significantly deteriorate and must be replaced. *Note - A standard operating procedure must be developed if the suits will be autoclaved. Suits that are to be autoclaved must be placed in an approved autoclave bag after each use and transported directly to the autoclave for immediate treatment.*
  - **Note: a surgical mask is not considered a respirator**— From OSHA: Surgical masks are not designed or certified to prevent the inhalation of small airborne contaminants. These particles are not visible to the naked eye but may still be capable of causing infection. Surgical masks are not designed to seal tightly against the user's face. During inhalation, much of the potentially contaminated air can pass through gaps between the face and the surgical mask and not be pulled through the filter material of the mask. Their ability to filter small particles varies significantly based upon the type of material used to make the surgical mask, so they cannot be relied upon to protect workers against airborne infectious agents.