BOISE STATE UNIVERSITY
ENVIRONMENTAL HEALTH, SAFETY AND SUSTAINABILITY

STANDARD OPERATING PROCEDURE

BIOHAZARDOUS MATERIAL SPILL CLEAN-UP

College/Dept: BSU Colleges, Departments, Laboratories	Building/Room:
Laboratory Name:	Revision: 1.0

Approval

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Overview

Spills involving biohazardous materials create exposure hazards. Exposure routes generally include absorption through the skin, especially if the skin is broken or irritated, inhalation if the spill created aerosols that may have dispersed in the air, contact with mucous membranes from aerosols or splashes and accidental ingestion through hand-to-mouth contact. Use of appropriate personal protective equipment is particularly important in decontaminating spills involving human pathogens.

Scope

This SOP provides basic safety guidance for the clean-up of a biohazardous material spill both inside and outside of a biosafety cabinet. This document only addresses BSL-1 or BSL-2 agents.

Potential Hazards

☒ Chemical	☐ Thermal	☐ Hydraulic	☐ Electrical	☐ Slip/Trip	☒ Biological	
☐ Mechanical	☐ Radiation	☐ Pneumatic	☐ Fire	☐ Fall	☐ Other	

Hazard Specifics: Biological hazards will depend on the nature of the biological materials used and the manner in which they are used (needle stick, aerosol, surface contamination, etc.).
Chemical hazards can include bleach or disinfecting agent.

Engineering Controls (EC)

☐ Fume hood	☒ Biosafety Cabinet	☐ Other Local Exhaust	☐ Shielding	☐ Other

EC Specifics: < if necessary, identify type, location, flow requirements, material requirements, etc.>

Training Requirements – except for classroom lab safety, must be completed prior to performing the procedure

☒ Boise State University Laboratory Safety	☐ Radiation Worker
☒ Biosafety Training	☒ Other (specify): Biowaste Guidance
☐ Lab/Work Group Specific Training (specify): Training regarding specific biohazards	

Personal Protective Equipment (PPE)

☐ Safety glasses	☒ Safety goggles	☐ Face shield & safety glasses	☒ Face shield & safety goggles
☒ Lab coat	☐ Apron	☐ Tyvek suit	☐ Tyvek sleeves
☒ Gloves	☐ Leg coverings	☐ Hard hat	☐ Hearing protection
☐ Respirator	☐ Shoes	☐ Fall protection	☐ Other

PPE Description: Powder-free nitrile gloves, lab coat, safety goggles and face shield depending on splash hazard or aerosol hazard

Equipment, Materials, Supplies, & Facility Requirements

- Disinfectant solution*
- Forceps, tongs, broom, dust pan
- Personal protective equipment (PPE): safety glasses, goggles, or face shield, utility gloves, wrap-around lab coat, shoe covers (optional)
- Biohazard bag, biohazard sharps container
- Paper towels or other absorbent

*A 1/10 dilution of household bleach (5-6% sodium hypochlorite as sold), prepared fresh daily is effective in most situations; contact EHSS for more information about selection of disinfectants, particularly for any organisms suspected of being atypical in their sensitivity to disinfectants.

Handling, Work Area & Storage Requirements

Personal exposure takes priority over clean up. If you are exposed, immediately remove contaminated clothing and other protective equipment and wash affected areas with soap and water. If medical follow-up is warranted it should be sought immediately.

Spills involving microorganisms requiring BSL-1 or BSL-2 (low to moderate risk agents) containment
* As with wild type microorganisms, those containing recombinant DNA are assigned a biological safety level. Clean-ups must proceed according to the guidance for the relevant biological safety level.

- Alert people in immediate area.
- Put on protective equipment.
- Cover an area twice the size of the spill with disinfectant soaked-paper towels. Or, surround spill with dry disinfectant as per label directions.
- Allow a 20 minute contact period.
- Wipe down any contaminated stationary equipment or furniture with disinfectant.
- Use forceps, tongs, or broom to remove broken glass and other items; place in sharps container (broken glass or any item that may puncture bag) or red bag (paper towels, gloves, etc.). If the microorganism of concern requires incineration as a treatment/disposal method (per approved protocol), package it separately in a leak-proof, sealable container and contact EHSS.
- Remove towels and re-clean area with disinfectant solution. It is best to gently pour the disinfectant solution on the spill area, as opposed to spraying, since spraying could create aerosols. Allow a second 20 minute contact period.
- Decontaminate (autoclave, chemical treatment) reusable clean-up items and other reusable equipment.
- Disinfect any waste bottles or other items that are stored nearby (particularly if biohazard compound is aerosolized)
- Remove personal protective equipment and thoroughly wash hands, arms, face, and any other

exposed body parts. Disinfect non-disposable PPE.
- Wash hands thoroughly with soap and water after gloves are removed.
- Report the spill incident to your lab supervisor or PI and fill out an Incident/Accident Injury Report Form (link?) and submit it to the Boise State Risk Management and Insurance Office.

Spills inside a Biological Safety Cabinet

- **Keep the cabinet running.**
  Clean-up as per directions above, making sure to wipe down equipment, back and side walls of cabinet, and any materials (including waste containers) sitting in the cabinet.
- If material has spilled into the catch basin beneath the work surface, add a volume of disinfectant equal to the quantity in the basin, wait 20 minutes, and absorb with paper towels.
- After completion, allow cabinet to run for ten minutes before resuming work.
- Wash hands thoroughly with soap and water after gloves are removed.
- Report the spill incident to your lab supervisor or PI.

Spills inside a centrifuge - *The potential for multiple infections from a single centrifuge accident is great. Aerosols are created when fluid escapes from the rotor or cup while the centrifuge is operating at high speed. All opening of centrifuges must be performed slowly.*

- Shut centrifuge off and do not open the lid for 30 minutes to allow aerosols to settle. If a breakage is discovered after the machine has stopped, re-close the lid immediately and allow the unit to sit for 30 minutes.
- Post a sign on the door of the room where the centrifuge is located indicating a spill has occurred and the room should not be entered.
- Unplug the centrifuge before initiating clean up.
- Put on PPE.
- Apply disinfectant soaked paper towels to all contaminated surfaces within the chamber, taking care to minimize splashing.
- Allow 20 minute contact period and then complete clean-up of the chamber using forceps and tongs to remove paper towels.
- Use mechanical means (such as forceps or tongs) to remove broken tubes and glass fragments. Place them in a biohazard sharps container for autoclaving and disposal as infectious waste. If the microorganism of concern requires incineration as a treatment/disposal method (per approved protocol), package it separately in a leak-proof, sealable container and contact EHSS.
- Remove buckets and rotors to nearest Biological Safety Cabinet; disinfect and clean as per manufacturer's instructions.
- Wash hands thoroughly with soap and water after gloves are removed.
- Report the spill incident to your lab supervisor or PI.

Spills Outside the Laboratory

- Viable organisms should only leave the laboratory in a well-sealed primary (inner) **and** secondary (outer) container with a closable top. A test-tube rack inside a tray is not acceptable.
- The exterior of the secondary container should be wiped down with disinfectant prior to leaving the laboratory so that it can be transported without wearing gloves.
- Carry paper towels and if a spill occurs use the towels to cover the spill but do not attempt a clean-up without appropriate disinfectant and personal protective equipment.
- Notify people in the immediate area, limit access and collect clean-up material and proceed with clean-up.

Emergency Response Equipment & Supplies

☒ Eyewash	☐ Fire extinguisher	☐ First aid kit	☐ Calcium gluconate gel (HF use)
☐ Safety shower	☐ Fire blanket	☒ Spill kit	☐ Emergency gas shutoffs
☐ Drench hose	☒ Other: Disinfectant and absorbent materials		

Description: Disinfectants can include bleach or other agents. Contact EHSS if you need help selecting a proper disinfectant.

Basic Biohazard Spill Kit Contents

1. Nitrile gloves (several pairs can be used for double gloving)
2. Lab coat or disposable gown
3. Goggles and/or face shield to prevent splashing of disinfectant or agent into mucous membranes
4. Disposable shoe covers
5. Small disposable broom with dust pan, tongs, or forceps
6. Red medical waste/biohazard bags and/or biohazard sharps container
7. Disinfectant suitable for the biologically hazardous materials found in the lab. Most often this is a container of household bleach (5-6% sodium hypochlorite) (< 1 year old) and a spray bottle to make up a fresh 10% solution.
8. Absorbent materials (i.e., paper towels)
9. Diking material or spill pillows for large spills (stops the spread of a spill)
10. Signage to post at lab entrance for controlling access (provided on next page)
11. Bucket to keep all spill clean-up supplies and for disposal of contaminated material (with biohazard symbol sticker).
12. Copy of this SOP

Decontamination & Waste Disposal

Gather all clean up materials for disposal and place in labeled, sealed bucket. Contact EHSS for disposal instructions.

Additional Safety Information

Review of applicable safety references such as safety data sheets to ensure appropriate protective measures, spill supplies, and first aid procedures.

References

NIH Guidelines for Research Involving Recombinant DNA Molecules (NIH Guidelines), National Institutes of Health

Biosafety in Microbiological and Biomedical Laboratories (BMBL), Centers for Disease Control and National Institutes of Health

Bloodborne Pathogens Standard, 29 CFR 1910.1030, Occupational Safety and Health Administration

Columbia University Biological Safety