# SOP TEMPLATE FOR WORKING WITH UNSEALED RADIOACTIVE MATERIALS

This SOP applies to all authorized radioactive materials users when working with unsealed radioactive material sources.

## Personal protective equipment (PPE) and personnel monitoring

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|  | **Eye protection**  At a minimum ANSI Z87.1-compliant safety glasses |  | **Gloves**  Consult with your preferred glove manufacturer to ensure that the gloves selected are compatible with the chemical(s) being handled |
|  | **Lab coat**  Chemically compatible |  | **Respiratory protection**  If you must use a respirator, please contact 206-616-3777 for training and fit testing |
|  | **Dosimetry**  Exchanged on a monthly or quarterly basis, if issued |  | **Bioassays**  Notices to submit for bioassays are included with radioactive material packages; please contact 206-543-0463 to schedule an appointment |

*Follow requirements set in* [*Laboratory Personal Protective Equipment (PPE) Hazard Assessment Guide*](https://www.ehs.washington.edu/system/files/resources/lab-ppe-hazard-assessment.docx)

*Image credit: UCLA Environment, Health & Safety*

### Radiation detection instrumentation

[Indicate all applicable radiation detection equipment to be used to measure for loose or fixed contamination and/or exposure monitoring and the measurement frequencies. Examples: Ludlum Model 3 with a 44-9 Pancake Probe to be used during experiments; checking gloves frequently when handling P-32 stock vials or Beckman 6500 Liquid Scintillation Counter to be used on a monthly basis as per the Radiation Safety Manual to measure for loose H-3 contamination.]

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| [Describe radiation detection equipment.] |

## Hazard controls

### Engineering controls

[Indicate any engineering controls will be used. Examples: Remote handling tools, shielding, interlocked safety devices, fume hoods, glove bags or glove boxes, etc.]

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| [Describe engineering controls.] |

### Designated areas

[List all authorized areas you plan to work in (e.g., storage locations, counting facilities, waste storage) and what it will be used for. Include a map if this is your initial application for a Radiation Use Authorization (RUA).]

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| Radioactive materials will only be used in work areas designated on the Radiation Use Authorization (RUA). Under no circumstance will radioactive material be moved to or used in an area not designated on the RUA (including a personal residence) without prior approval from Radiation Safety.  [List authorized work areas.] |

### Security

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| Radioactive materials must be secured when not in use and locations locked when unattended. Radioactive materials can be secured in locked storage containers, provided these containers cannot be easily removed from the premises.  Any loss or potential loss of radioactive material must be reported to Radiation Safety 206.543.0463 soon as possible after the loss is suspected.  [Indicate additional security precautions your lab will take to secure radioactive materials, if any.] |

## contamination control and waste management

### CONTAMINATION CONTROL

Clearly label contaminated equipment, glassware, containers, etc. until it has been decontaminated and measured to be below the action level. The action level is an LSC reading of 100 cpm above background or count rate meter reading of 2X background.

Surface of contamination can be cleaned with paper towels and a decontamination solution. Start by wetting a paper towel with your decontamination solution and, working from the outer edge of the contaminated area, wipe the surface inward toward the center of the contaminated area. Discard the towels into a radioactive waste container after each pass. Do not re-use the paper towels or wipe the contaminated area in a circular fashion. Repeat this until the paper towels are no longer picking up removable contamination.

Notify UW Radiation Safety at **206.543.0463** of surface contamination exceeding the action level.

### WASTE DISPOSAL

For more information, see [Radioactive Waste Management](https://www.ehs.washington.edu/radiation/radioactive-waste-management)

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| Dry Waste: Collect the dry waste in durable plastic bags. [If your waste warrants shielding indicate that here, e.g., P-32 waste should be kept in Plexiglas shielding]. Indicate the radionuclide for that container, activity, and date sealed on the waste label affixed to the box.  Liquid Waste: The UW is allowed to dispose of material that is soluble or readily dispersible in water into the sanitary sewer, as long as quantities are restricted. Refer to Section 14.A.2.a of the Radiation Safety Manual for sink disposal limits. Each radioactive materials laboratory may have a sink or drain designated for radioactive liquid waste disposal. Records of all sink disposals must be maintained by each PI to show compliance within the limits. Radiation safety has a Form 170 *Quarterly Sink Disposal Record for Radioactive Material* for this purpose.  Collect all other radioactive liquid waste in tightly capped bottles or carboys within secondary containment. [If your waste warrants shielding indicate that here; e.g., P-32 waste should be kept in Plexiglas shielding]. Label the waste container with a caution radioactive materials label and indicate the radionuclide for that container (e.g. “P-32”).  Liquid Scintillation Vial Waste: No sewer disposal of radioactive liquid scintillation vial (LSV) waste is permitted even for biodegradable cocktails. Collect all LSV waste in the original cardboard trays provided by the vendor. Make sure that each vial is tightly capped. Keep the trays in secondary containment (e.g. buckets or Nalgene wash tubs, etc.).  IF YOU BELIEVE YOUR RESEARCH WILL GENERATE MIXED WASTE YOU MUST GET PRIOR APPROVAL FROM EH&S – RS BEFORE YOU GENERATE THIS WASTE. Remember to segregate your waste by radionuclide and by waste type.  When the waste container is full, request a [Radiation Waste Collection Request](https://www.ehs.washington.edu/secure/radiation-waste-collection-request). Keep liquid waste bottles and carboys stored in secondary containment until the waste is picked up by Radiation Safety (this process typically takes five business days). |

### DECAY IN STORAGE

1. **Short-lived dry solid waste** consists of lab waste (gloves, benchpads, pipette tips, etc.) and other items with a half-life of less than 120 days. Waste will be stored for decay in a shielded box until ready for disposal.
2. Deface radiation symbols and labels before placing waste in box. Sharps should be in a strong container then placed in box. Complete a *Declaration of Decay in Storage Form 176 pt 1*. Once the box is filled, seal the inner liner with a zip tie or tape. Seal the box with strong tape. Fill out label on waste box with radioisotope, activity, PI name, lab room number, and date.
3. After ten half-lives have passed, trained RUA personnel from the lab survey the waste box with the appropriate meter. Waste can be disposed of as non-radioactive waste if there is no measurable activity over background. Complete a *Final Disposition of Decay in Storage Form 176 pt2* and submit to RS.

## emergencies

**Call 911 For Any Life-Threatening Emergency and Perform Appropriate First Aid.**

**S.W.I.M FOR ALL SPILLS\***

**S**: **Stop** the spill. Cover with absorbent material.

**W**: **Warn** others. Alert people in the immediate area of the spill.

**I**: **Isolate** the spill and secure the area. Close doors if possible.

**M**: **Minimize** your exposure by wearing PPE and avoiding contact, inhalation, or ingestion. Vacate the area if necessary. Wash hands after handling spill materials.

Utilize time, distance and shielding to prevent exposure.

Wear gloves and use tongs/scoop to collect contamination materials as radioactive waste.

Call UW Radiation Safety at **206.543.0463** or **911** if office is closed, notify your supervisor, and report spills within 24 hours via UW OARS: <https://oars.ehs.washington.edu>

**\*Spill is surface contamination resulting in an LSC reading of 100 cpm above background or count rate meter reading of 2X background.**

**In the event of skin contamination**:

Remove contaminated clothing and wash the contaminated area thoroughly for 15 minutes with warm water and sudsing soap. Survey skin and wash until the count rate cannot be reduced further. Stop if skin becomes irritated.

**In the event of Inhalation or ingestion**:

Move out of the contaminated area and seek fresh air. Do not induce vomiting unless instructed to do so. Blow nose into clean tissue and survey for contamination.

Call UW Radiation Safety at **206.543.0463** or **911** if the office is closed and notify your supervisor. Provide the radionuclide, estimated amount and time since exposure. For hospitalization or fatality notify EH&S immediately after performing first aid and getting medical help by calling the EH&S main phone line at **206.543.7262** or after hours call **206.685.UWPD(8973)**.

Submit a report via the UW Online Accident Report (OARS) within 24 hours at <https://oars.ehs.washington.edu>

## Notifications

**RS must be notified immediately of any of the following situations**:

Skin contamination

Ingestion of radioactive material

Unexpected personnel exposure

Airborne radioactivity

Loss or theft of radioactive materials

Spills\*

**\*Spill is surface contamination resulting in an LSC reading of 100 cpm above background or count rate meter reading of 2X background.**

## Experimental description and processes

[Provide a brief description along with the intended end goal of your experiment and the procedural steps involving radioactive material handling by each worker. The process should be detailed sufficiently such that radiation safety practices can be evaluated.]

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| [Describe experiment and steps.] |

## Other hazardous materials

[In addition to radionuclides, list all other hazardous materials that will be used in this experiment or could be potential hazardous intermediate byproducts. Please emphasize any mixed hazards produced during the experiment or any potential volatility of radioactive hazards.]

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| [List hazardous materials.] |

#### Special handling and storage requirements

[Describe in general what special handling procedures you will use to work safely and keep your dose as low as reasonably achievable (ALARA). Greater detail and the precautions taken at a particularly hazardous step of the process should be outlined here.

Describe any special storage requirements for your stock radioactive materials, materials in process, and wastes.]

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| [Describe special handling procedures and storage requirements.] |

#### For additional information please refer to the UW Radiation Safety Manual.

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| PI Signature |  | Date |

## Initial Lab-specific training documentation

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