

**SUBJECT: **GUIDELINES FOR HANDLING RADIOACTIVE MATERIALS AND
RADIATION PROTECTION****

1. **PURPOSE:** The purpose of these guidelines is to control the receipt, possession, use, transfer, and disposal of radioactive materials in a safe manner that maintains compliance with federal regulations and Department of Veterans Affairs policies.

2. **DEFINITIONS:**

ALARA	As Low As Reasonably Achievable
ARSO	Assistant Radiation Safety Officer
NHPP	National Health Physics Program
PI	Principal Investigator
PPE	Personal Protective Equipment
RAM	Radioactive Material
RSC	Radiation Safety Committee
RSO	Radiation Safety Officer
VMU	Veterinary Medical Unit

3. **DIVISION OF RESPONSIBILITIES:**

- a) Radiation Safety Committee (RSC) is responsible to the Minneapolis VAHCS Director for:
 - i) The radiological safety of all patients and personnel exposed to ionizing radiation from radioactive material and machine generating sources (x-ray tubes, etc.).
 - ii) Compliance with the National Health Physics Program (NHPP), VHA Directives 1105, 1105.04, and 1129.
 - iii) Determining whether a principal investigator (PI) is qualified to use radioactive material in accordance with the NHPP Directives.
 - iv) Holding meetings at the request of the chairperson.
 - v) The records of all Committee proceedings and actions.
 - vi) The quarterly reviews, with the assistance of the Radiation Safety Officer (RSO), of the Occupational Radiation Dose Records of all personnel working with radioactive material.
 - vii) Reviewing the remedial actions to correct any violations or deficiencies found by the NHPP during routine compliance inspections.
- b) Individual PIs are responsible for:
 - i) The radiological health and welfare of their personnel as well as reporting to the RSC any Minneapolis VAHCS patients or staff who are exposed to radiation due to their project(s).
 - ii) Reporting to the RSO any health or contamination hazards that may result from their project(s). The PIs are responsible for all corrective actions necessary to eliminate or minimize these hazards. If the PI cannot carry out the corrective actions, they can request the assistance of the RSO or the RSC.
 - iii) Seeing that each member of their staff designated to use radioactive material receives the required radiation safety training. This training is mandatory prior to the use of and work with radioactive material.

- iv) Maintaining the required records of usage of all radioactive material delivered to them, i.e., records of use, sink disposal records and radioactivity monitoring reports.
 - v) Monitoring for contamination in their work areas, ensuring that any contamination is cleaned up, and keeping records on the contamination levels found.
 - vi) Seeing that each member of their staff wears a dosimeter badge properly if the project involves the use of RAM that requires personnel monitoring as per the NHPP Guidelines and/or per the RSO.
 - vii) Contacting the RSO for technical assistance or support in resolving radiation related concerns. The RSO can be reached at Extension 31-2620 or the Assistant RSO may be reached at Extension 31-4574.
- c) RSO is responsible for:
- i) Reviewing and processing through appropriate VA channels all changes and amendments to NHPP Permit for the Minneapolis VAHCS.
 - ii) Keeping all the records required by the NHPP as set forth in their Guidelines.
 - iii) Reviewing and approving all requisitions for the purchase of RAM.
 - iv) Handling all emergencies arising with the use of RAM.
 - v) Training personnel who work with radioactive materials.
 - vi) Reviewing RAM usage and exposures on all projects and reporting any violations of the NHPP Guidelines to the PI and the RSC.
 - vii) Ensuring all radiation detection and measurement equipment is calibrated on an annual basis.
 - viii) Establishing policies and procedures for the safe management of all radioactive waste and maintaining records regarding this waste.
 - ix) Specifying the procedures that must be followed by all persons involved in the handling and care of animals that receive radioactive materials (RAMs).
 - x) Assisting the RSC to insure minimal health and contamination hazards to all patients, staff, visitors of the Minneapolis VAHCS and residents. Continued commitment to ALARA as stated in 10 CFR 20.1003. *ALARA* (acronym for "as low as is reasonably achievable") means making every reasonable effort to maintain exposures to radiation as far below the dose limits as practical; consistent with the purpose for which the licensed activity is undertaken. This includes considering the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, other societal and socioeconomic considerations, and the utilization of nuclear energy and licensed materials in the public interest.

4. LABORATORY AND FACILITY ADEQUACY:

- a) To minimize the health and contamination hazards accompanying receipt, storage, handling, use and disposal of RAM, each PI must have adequate facilities in which to conduct their radioactive work.
- b) Requirements for these facilities include good ventilation, dish washing and decontamination facilities, shielding, remote handling devices, protective apparel, private rooms for patients when required, etc.
- c) Each project must be examined individually and the RSO will determine whether facilities are adequate for a given project and/or will recommend ways to improve the facilities.

5. APPLICATION FOR LICENSE BY PIS:

- a) PIs must apply with the RSO to become an Authorized User of RAM before ordering or using RAM in their laboratory and project(s).
- b) Authorized User applications are available through the RSO's office.
- c) The application must be filled out completely and returned to the RSO.
- d) The Authorized User application will be reviewed by the RSO and voted on by the RSC at their next quarterly meeting.
- e) Upon approval as an Authorized User for their project, certain provisions may be set down by the RSO to ensure the health and welfare of the PI and their staff, to meet the goals of ALARA. Failure to comply with these provisions will be just cause for revocation of Authorized User status.

6. REQUISITION AND PROCUREMENT OF RAM:

- a) All requests for the purchase of RAM must be approved by the RSO, or their designee, within the scope of the NHPP Permit.
- b) Requests must meet the following conditions:
 - i) PI is a current Authorized User and is authorized by the RSO to receive the requested RAM.
 - ii) The maximum possession limit of the Minneapolis VAHCS's NHPP Permit will not be exceeded by receipt of the order.
 - iii) The maximum possession limit of the PI will not be exceeded by receipt of this order.
 - iv) Radioactive Material Inventory/Order Form (Appendix A) must be completely filled out by the laboratory personnel and delivered to Radiation Safety.
 - v) RAM Inventory/Order Form must reference an approved protocol number. The Radiation Safety Office will verify this is an active protocol with the Research Office prior to processing form and ordering.
 - vi) Once the order for RAM has been placed, the person responsible for placing the order must notify the Radiation Safety Office, providing an estimated date of arrival and shipping/PO reference number.
- c) If an order does not arrive within two weeks from the date the order was placed, the Radiation Safety Office reserves the right to retract your request until such time that the RAM becomes available. If an order is not approved, the RSO will contact the investigator and explain the reason(s). Failure to comply may result in revocation as an Authorized User.

7. RECEIPT, STORAGE, AND DISTRIBUTION:

- a) The receipt, storage, and distribution of all RAMs are without exception the responsibilities of the RSO or their designee.
- b) Receipt:
 - i) All radioactive material used at this facility, whether purchased by the Minneapolis VAHCS, through the University of Minnesota or other sources, shall be received by the RSO or designee.
 - ii) In compliance with 10 CFR 20.1906, the RSO or the designee will pick up all radioactive shipments in the warehouse and examine them for damage, breakage, or leakage as well as proper labeling. The RSO or designee shall "wipe-test" the outer carton of the shipment. If

no contamination is found on the outer carton, the shipment will be entered into the "Cradle to Grave" bar code inventory system and then delivered to the responsible investigator/laboratory. If the outer carton of the shipment is contaminated or if the order is incorrect, the RSO's office and/or PI will contact the vendor and arrange for the return and replacement of the order.

- iii) It is the responsibility of the laboratory personnel receiving RAM to remove or deface all labels and printed matter describing RAMs on the shipping carton or container in which RAM was shipped prior to disposal of the item.

c) Storage:

- i) Only designated sites as approved and posted by the RSO.
- ii) Temporary storage areas may be designated by the RSO.
- iii) All permanent storage areas satisfy the following requirements:
 - 1) They have sufficient shielding to reduce external radiation to permissible levels that meet occupational dose limits stated in 10 CFR 20.1201.
 - 2) They are adequately posted with appropriate signs according to the levels of activity present in the area.
 - 3) A properly operating and calibrated survey instrument is available in the area. The range of the instrument is such to ensure the monitoring of the highest radiation level that can possibly arise in the area.
 - 4) The areas are locked when not under the direct supervision of qualified personnel.

8. WASTE DISPOSAL PROCEDURES:

- a) For practical purposes, radioactive wastes are divided into three classes: solid, liquid, and gas. All contaminated waste should be handled as RAM and personnel shall follow all regulations set forth in 10 CFR 20.2001 – 10 CFR 20.2008, when disposing of such materials.
- b) Liquid Waste Disposal into the Sanitary Sewer:
 - i) All liquid radioactive waste must be water soluble or biodegradable to be disposed of into the sanitary sewer system. Liquid radioactive waste should be given to the RSO for disposal.
 - ii) The RSO will determine how much RAM can be disposed into the sanitary sewer according to the type and quantity of RAM being used by the Investigator.
 - iii) Large amounts of detergent/water must be used when disposing of RAM down the drain.
 - iv) Any radioactive liquid waste that is collected and placed in the radioactive waste room must be properly contained and labeled. The label shall identify the RAM, its activity, the date, lab room number, the telephone extension, and the person's initials.
- c) Solid Radioactive Waste Disposal:
 - i) All solid radioactive waste material with a half-life ≤ 120 days shall first have their radioactive labels defaced, then placed in plastic bags in the radioactive waste room. Labels on radioactive waste with half-lives greater than 120 days shall remain intact prior to being placed in the plastic bag. Different RAMs must be bagged separately.
 - ii) All bags must be sealed and properly labeled. The label shall identify the RAM, its activity, the date, lab room number, telephone extension, and the person's initials.
 - iii) Biological tissue waste must be properly labeled and put in the appropriate freezer.
 - iv) No radioactive waste shall be disposed of in the "Red Biohazard" waste barrels.

- v) Contaminated sharps shall be packaged for disposal, e.g., in an enclosed sharps container to prevent any sharps injury to persons handling them, labeled as in 7. b) v) above, and placed in the radioactive waste room.
- d) Gaseous Radioactive Waste:
 - i) Radioactive wastes in gaseous form will be controlled so that their release to the atmosphere will not result in activity levels in working areas and/or unrestricted areas exceeding the permissible concentrations established by the NHPP.
 - ii) Contact the RSO before releasing any radioactive gases.

9. WORK AREA SURVEYS AND INVENTORIES:

- a) It is the responsibility of Authorized Users of RAM to perform weekly or monthly surveys of their work areas in the lab and in common service rooms for contamination. The results shall be properly recorded in the Radioactive Contamination Report and submitted to the RSO.
- b) The methods for the contamination surveys are detailed in Appendix B.

10. SURVEY INSTRUMENTS:

- a) Some investigators have purchased radiation survey/detection instruments for use in their research laboratories. These instruments are maintained by the investigator, except for the annual calibration done on them by the RSO.
- b) The RSO also maintains some survey instruments for use by research investigators. These instruments are available upon request by any laboratory personnel.

11. PERSONNEL MONITORING:

- a) Dosimeters for personnel monitoring are not automatically issued to persons in Research Service who use RAM in their research. This determination is made on a case-by-case basis by the RSO.
- b) Any personnel issued dosimeters are instructed on the wear and use of such devices.
- c) Dosimeters are exchanged on a quarterly or monthly basis.

12. PREGNANT WORKER POLICY:

- a) Pregnant personnel in Research who work with RAMs have the right to choose whether or not to declare their pregnancy.
- b) If they choose to declare, they must do so in writing to their supervisor and the RSO. Included in the declaration must be the estimated date of conception. If the pregnancy is declared, it is the responsibility of the RSO to ensure that the dose to the embryo/fetus does not exceed the established exposure limit as stated in 10 CFR 20.1208.
- c) If they choose not to declare their pregnancy, then the facility is under no obligation to measure and document the exposure received by the embryo/fetus.

13. CARE OF RADIOACTIVE ANIMALS:

- a) Radioactive animals will be kept in separate cage racks from non-radioactive animals.
- b) The cage rack will have a "CAUTION: RADIOACTIVE MATERIAL" sign on it. On this sign, the RAM and the amount will be listed along with the name of the researcher.
- c) Waste products will be collected in plastic bags for disposal by the RSO, if necessary. In all cases, the RSO shall check the waste before disposal.
- d) The animal caretakers shall wear PPE minimally consisting of disposable gloves and a respirator mask when handling waste and bedding from radioactive animals. Normally, there is no external radiation hazard. If an external hazard exists a warning will be posted, and the Animal Caretakers shall be properly trained in accordance with Federal guidelines.
- e) The disposal of dead animals will be supervised by the RSO. The animal caretaker should not act on their own. Dead animal carcasses MUST be placed in a designated radioactive animal carcass freezer. Contact the VMU, or the Assistant RSO, for freezer locations.
- f) Any animal room where radioactive animals are kept will be locked when not under the direct supervision of a caretaker or researcher.
- g) The Animal Caretaker shall wear PPE minimally consisting of gloves and a respirator mask during cage decontamination. Normal cage washing procedures are sufficient for decontamination. The researcher involved is responsible for checking the cage for contamination before it is released for reuse.
- h) Contact the RSO or Assistant RSO immediately if problems occur.

14. SPECIAL EQUIPMENT:

- a) Since the needs and problems of each project differ, the RSO will recommend to each investigator any special equipment necessary to minimize health and contamination hazards, meeting ALARA goals.
- b) Various types of shielding for gamma and beta radiation are available through the RSO. Also available are shielded containers to be used for transporting RAM from the permanent storage areas to the laboratories.
- c) Metabolism cages are available for collecting excreta from experimental animals, both for the purpose of studying the excreta and for the purpose of limiting the radioactive contamination. Sizes of the cages range from individual mouse size to medium size dog cages.
- d) The VAHCS staff includes physicists, chemists, physicians, and the medical-surgical staff who can design special equipment, and electronic and machine shops staffed by technical personnel who can build special equipment and/or modify commercial equipment to eliminate or minimize many hazards of RAM usage.

15. CONTAMINATION CONTROL:

- a) Confinement and control of radioactive contamination can be achieved by cooperation, careful work habits, and project planning by everyone who has contact with laboratories and projects using RAM. Foreseeable health hazards can and must be eliminated or minimized before they occur via appropriate planning by the investigator. The RSO can assist, if necessary. While contamination can seldom be completely eliminated in a laboratory, many ways to reduce contamination problems are available to the investigator. Some of these are:
 - i) Confinement of contamination by using leak-proof stainless steel trays.
 - ii) Lining trays with absorbent paper and changing these liners as often as necessary.
 - iii) Using proper radioactive handling procedures.

- iv) Using fume hoods when applicable.
- v) Performing "dry runs" of new procedures to determine where problems might arise.
- vi) Using proper procedures for the removal and handling of waste.
- vii) Adequate use of decontamination procedures.

16. GENERAL RULES FOR PERSONNEL HANDLING RAMS:

- a) The primary goal in research laboratories is to prevent contamination of work areas, apparatuses, and glassware that may affect the accuracy of tracer experiments. In addition, precautions must be taken to prevent the health hazard of chronic inhalation or ingestion of RAMs. The following rules must be followed:
 - i) NO SMOKING, EATING, DRINKING, OR APPLYING COSMETICS IN LABORATORIES, COUNTING ROOMS, INSTRUMENT ROOMS, RECEIVING ROOM, OR TREATMENT ROOMS.
 - ii) NO INDIVIDUAL WITH OPEN CUTS OR ABRASIONS IS PERMITTED TO WORK WITH RAMS WITHOUT TAKING SPECIAL PRECAUTIONS.
 - iii) NO COATS OR LINENS ARE TO BE SENT TO THE LAUNDRY UNLESS THEY HAVE BEEN MONITORED FOR CONTAMINATION.
 - iv) LABORATORY COATS SHALL BE WORN BY ALL INDIVIDUALS WHEN WORKING WITH RAM.
 - v) DISPOSABLE GLOVES SHALL BE WORN WHEN HANDLING RAM. Used gloves must be disposed of as radioactive waste.
 - vi) ALL INDIVIDUALS SHALL WASH THEIR HANDS THOROUGHLY AFTER WORKING WITH RAM.
 - vii) AT THE COMPLETION OF ANY ONE JOB, OR AT THE END OF THE DAY, EACH INDIVIDUAL SHALL CLEAN THEIR AREA AND DISPOSE OF ANY CONTAMINATED MATERIAL NO LONGER NEEDED.
 - viii) ANY CONTAMINATED EQUIPMENT, INSTRUMENT, TOOL, ETC. THAT MUST BE REPAIRED SHALL BE MONITORED AND DECONTAMINATED BEFORE IT IS SENT OUT FOR REPAIR.
- b) The following rules apply to all laboratory procedures involving RAM:
 - i) All RAM not under the direct supervision of qualified personnel shall be secured in a locked storage area.
 - ii) Work with RAM is to be carried out on bench-tops or in fume hoods lined with absorbent paper which shall be removed and disposed of as radioactive waste at the end of the procedure or when contaminated.
 - iii) Any manipulations involving volatile RAM or sprays shall be carried out in a fume hood.
 - iv) All containers of RAM must be kept covered when not in use.
 - v) All unnecessary equipment should be kept away from any area where RAM is being used.
 - vi) When using reagents, utmost care should be taken to prevent contamination of stock supplies.
 - vii) Before centrifuging RAM, run a non-radioactive sample in the same manner at a higher speed to make sure the centrifuge tubes will withstand the forces used.
 - viii) Whenever a new procedure involving RAM is to be attempted, a "cold" run of the procedure without the radioactivity must be made for the purpose of locating and eliminating any unforeseen possibilities of spills or equipment breakage which could result in radiation hazard or contamination.
 - ix) Any glassware weakened by a chip or crack must not be used for radioactive work.

17. HANDLING AND WASHING OF GLASSWARE:

- a) The basic requirements are as follows:
 - i) Each laboratory must protect its own glassware from contamination and observe the rules set up for the general use of available equipment.
 - ii) Each laboratory or group of laboratories shall have one or more sinks posted for washing contaminated glassware. These locations and sinks shall be approved by the RSO.
 - iii) No other sinks, except those designated and approved by the RSO, shall be used for washing contaminated glassware.
 - iv) Each group should mark its own glassware to distinguish that used for radioactive work.
- b) No glassware that has been used for radioactive work shall be returned to a stock room.

18. COUNTING AND ANALYTICAL INSTRUMENT ROOM PROCEDURES:

- a) The utmost care must be taken to prevent the contamination of work areas and equipment in the counting and analytical instrument rooms. The following requirements apply:
 - i) Personnel shall not enter these rooms wearing coats or gloves that could be potentially contaminated with RAM.
 - ii) No radioactive samples are to be left or stored in these rooms.
 - iii) No preparation or manipulation of radioactive samples is to take place in these rooms.
 - iv) Standard and background counting rates should be measured and recorded each day when a counting system is used in order that any contamination can be immediately detected and prevented from spreading. Unusual background rates should be reported as soon as possible to the RSO.

19. RADIATION EMERGENCIES:

- a) Based on the quantity of the material involved, most spills occurring in Research labs are minor spills. Any spill involving a potentially volatile RAM (e.g., radioiodine) is a major spill. The following are some general guidelines that shall be followed in the event of a spill:
 - i) Minor spills:
 - 1) Notify persons in the laboratory or affected area that a spill has occurred.
 - 2) Cover the spill with absorbent pads. If possible, the spill should be shielded, but only if it can be done without further contamination or without significantly increasing exposure.
 - 3) Confine the movement of all potentially contaminated personnel and evaluate for contamination before allowing them to leave the location.
 - 4) Clean up using disposable gloves and remote handling tongs (if necessary). Carefully fold the absorbent paper and pad. Insert into a plastic bag and dispose of in the radioactive waste container. Include all other contaminated materials such as disposable gloves.
 - 5) Survey with smear wipes and a survey meter (if appropriate). Check the area around the spill, hands, and clothing for contamination.
 - 6) Report the incident to the RSO (31-2620) or ARSO (31-4574) within 24 hrs.
 - ii) Major spills:
 - 1) Notify all persons not involved in the spill to vacate the laboratory or affected area.

- 2) Call for help. During normal office hours, notify the RSO (31-2620) or ARSO (31-4574). If after hours, call 1-911.
 - 3) Cover the spill with absorbent pads. The spill should be shielded, but only if it can be done without further contamination or without significantly increasing exposure.
 - 4) Confine the movement of all potentially contaminated personnel and evaluate for contamination before allowing them to leave the location.
 - 5) Leave the room and lock the door(s) to prevent entry. Placard the door so that no one inadvertently unlocks the door or enters the room.
 - 6) Clean up the spill under the guidance of the RSO or ARSO.
- iii) Personnel Contamination.
- 1) Radiation Safety must be notified immediately of any incident involving personnel contamination, regardless of the radionuclide or activity. During normal office hours, notify the RSO (612-467-2620) or ARSO (612-467-4574). See Section 20 for decontamination procedures.

20. DECONTAMINATION PROCEDURES:

- a) An evaluation shall be made of personnel contamination using a survey meter on hand or available from the RSO. If contamination is found on the clothing, clothing should be removed and held for further evaluation by the RSO. If appropriate monitoring instrumentation is NOT available, call the RSO or Assistant RSO for assistance.
- b) Skin decontamination.
 - i) For decontaminating skin surfaces, begin by thoroughly washing with soap and water, and progress to more involved procedures until the contamination is reduced to an acceptable level. The following is a decontamination sequence that can be used.
 - 1) Check contaminated area(s) with a survey meter.
 - 2) Wash contaminated area(s) thoroughly with warm (not hot) water and detergent for 2-3 minutes, working up a good lather, but being careful not to scald, scrub, or scratch your skin. Dry well with paper towel and resurvey. If contamination has been reduced, keep re-washing and surveying as long as there is a reduction in contamination. If after consecutive washings the contamination is not at background levels or is no longer decreasing, proceed to the next step (c).
 - 3) Repeat washing step using a hand surgical brush, being careful not to apply excess pressure that could scratch the skin. Resurvey. Decontamination should continue until no activity is detectable but should stop if effectiveness of the skin as a barrier is destroyed. Decontamination efforts should cease when the skin starts to become thin and reddened. The health of the skin should be maintained to minimize absorption and internal deposition of RAM.
 - ii) Eye decontamination: If a person's eyes are splashed with RAMs, immediately flush the eyes with water for a **minimum** of 15 minutes using an eye wash station.
- c) Internal contamination: If it is suspected that internal contamination has occurred resulting from accidental ingestion, inhalation, or skin puncture, contact the RSO immediately. Arrangements must be made for necessary bioassay and medical tests to determine the extent of potential exposure.

- d) General decontamination: See Appendix C for decontamination procedures for various types of materials and surfaces.

21. REFERENCES:

- 1) VHA Directive 1200.05, Requirements for the Protection of Human Subjects in Research. https://www.va.gov/vhapublications/publications.cfm?pub=1&order=asc&orderby=pub_Number
- 2) VHA Directive 1200.08, Safety of Personnel and Security of Laboratories Involved in VA Research. https://www.va.gov/vhapublications/publications.cfm?pub=1&order=asc&orderby=pub_Number
- 3) VHA Directive 1105, Management of Radioactive Materials. https://www.va.gov/vhapublications/publications.cfm?pub=1&order=asc&orderby=pub_Number
- 4) VHA Directive 1105.04, Fluoroscopy Safety. https://www.va.gov/vhapublications/publications.cfm?pub=1&order=asc&orderby=pub_Number
- 5) VHA Directive 1129, Radiation Protection for Machine Sources of Ionizing Radiation. https://www.va.gov/vhapublications/publications.cfm?pub=1&order=asc&orderby=pub_Number
- 6) 10 CFR PART 20, Standards for Protection against Radiation. <http://www.nrc.gov/reading-rm/doc-collections/cfr/part020/>
- 7) National Health Physics Program (NHPP) Sharepoint. <https://dvagov.sharepoint.com/sites/vhanhppmain/SitePages/About-us.aspx>

22. SRS APPROVED: August 29, 2023

23. RESCISSIONS: SRS-017 Guidelines for Handling Radioactive Materials and Radiation Protection. Approved January 26, 2021

24. EXPIRATION DATE: N/A

25. FOLLOW-UP RESPONSIBILITY: Subcommittee on Research Safety (SRS)

26. APPENDICES:

- A. RAM Inventory/Order Form
- B. Methods and Frequency for Conducting Radioactive Contamination Surveys
- C. General Decontamination Procedures

Appendix A: RAM Inventory/Order Form

Radioactive Material/Order Form Attn: Radiation Safety Officer Mpls VA Medical Center			
Date:		MSDS Sheet on file in Lab: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Service:		Bldg:	Floor/Rm #: Ext:
License/User:		Person Responsible for Inventory:	
Order/Chemical Information			
<input type="checkbox"/> VA Order <input type="checkbox"/> Non VA or U of M		Date Required:	27. <u>RSO Signature Required:</u>
Delivery instructions: Deliver to the attention of the <i>Radiation Safety Officer</i>			
Product Name:		RAM Name:	
Catalog Number of RAM:		Protocol Number:	
Quantity Ordered	Unit Price:	Total Price:	
	\$	\$	
Physical State (<i>Circle all that apply</i>): Pure liquid Solution Solid Mixture Gas			
RAM (Circle) ³ H ¹⁴ C ³² P ³⁵ S ⁵¹ Cr ¹²⁵ I Other (specify) _____		Specific Activity (dpm/mole, etc)	28. <u>Total Radioactivity (μCi, mCi, etc)</u>
Storage location:	Date Received:	29. <u>Bar Code</u>	
Vendor Information			
Manufacturers Name:		Phone Number:	
Address:			
City:	State:	Zip:	
Disposal Information/Return form to RSO			
<input type="checkbox"/> Check here if RAM was used up		Date used up:	
Otherwise, indicate disposal procedure and date:			
30. <u>If sewerred, was RAM sink log filed?</u> <input type="checkbox"/> Yes <input type="checkbox"/> No			
PLACE COMPLETED FORM IN RSO'S MAILBOX IN THE RESEARCH OFFICE			

Appendix B: Methods and Frequency for Conducting Radioactive Contamination Surveys

I. Frequency of Survey.

The NHPP requires that each laboratory licensed to use radioactive material conduct a monthly contamination survey of their work area and submit documentation of the findings to the RSO.

II. Wipe-Tests.

A series of wipe-tests shall be taken in all areas where radioactive material is handled in unsealed form. These locations shall be indicated on a survey form and should be chosen for maximum probability of contamination. Floors adjacent to doorways plus doorknobs, drawer handles, refrigerator handles and telephones should also be wipe-tested frequently. Care shall be taken to prevent any cross-contamination.

When checking for beta emitters, place the wipe in a liquid scintillation cocktail and count it in a liquid scintillation counter. A gamma counter should be used for gamma emitters (make sure the efficiency of the counter is known). In checking for different RAMs on the same wipe, the dry wipe should be counted first for gammas and then put into a cocktail and counted for betas.

III. Contamination Limits.

An individual wipe should cover approximately 100-150 cm². A level for beta-gamma at which cleanup is initiated is 200 DPM.

IV. Responsibility.

It is the responsibility of the RSO to see that the proper surveys are being made. It is the responsibility of the individual Authorized User or designee to survey and record the survey data for their area. Any contamination found during a survey shall be cleaned up and the area rechecked. This should be noted on the survey form.

V. Survey Forms.

Laboratory-specific changes may be made on the Radiation Contamination Report, but all the necessary information must be retained on the survey form. One copy of the completed form should be kept on file in the laboratory and one copy sent to the RSO at the end of each month. Any problems or questions should be discussed with the RSO immediately.

VI. Control.

Non-compliance with this requirement for area surveys will be brought to the attention of the RSC. This Committee has the authority to revoke the laboratory's RAM license.

Appendix C: General Decontamination Procedures

<u>Contaminated Material</u>	<u>Decontamination Steps*</u>
Glass:	1. Dish detergent and warm water 2. Lift-away
Porcelain:	1. Lift-away, NoCount, or Radiacwash
Stainless Steel:	1. Dish detergent and warm water 2. NoCount or Radiacwash
Brass:	1. Dish detergent and warm water 2. NoCount, Radiacwash or Lift-away
Plastics:	1. Dish detergent and warm water 2. NoCount, Radiacwash or Lift-away
Paints:	1. Dish detergent and warm water 2. NoCount, Radiacwash or Lift-away
Aluminum:	1. Dish detergent and warm water 2. NoCount, Radiacwash or Lift-away
Rubber Tile:	1. Detergent and warm water 2. Radiacwash, Lift-away or NoCount
Linoleum:	1. Dish detergent and warm water 2. Radiacwash, Lift-away or NoCount
Vinyl Tile:	1. Dish detergent and warm water 2. NoCount, Radiacwash or Lift-away
Ceramic Tile:	1. NoCount, Radiacwash or Lift-away

* Radiacwash, NoCount, and Lift-away are available from the RSO. These products are used straight, i.e., without dilution. The steps listed are to be used in sequence until radioactive activity is reduced to an acceptable background based on the radioactive material involved.