




RAM Lab Close Out			
<small>SOP NUMBER</small> EHS-SOP-RAD-501.02	<small>SUPERSEDES SOP (IF APPLICABLE)</small> EHS-SOP-RAD-501.01		
<small>Latest Version Prepared By</small> Cade Register, RSO	<small>APPROVAL</small> Cade Register, RSO	<small>EFFECTIVE DATE</small> 7/10/2024	<small>PAGE NUMBERING</small> Page 1 of 3

1. **Purpose:** The purpose of this SOP is to provide guidance for performing the required close out when the use of RAM is discontinued in a laboratory or room.
2. **Scope:** RAM users should use this SOP to review the requirements for performing a close out.
3. **Definitions:**
 - 3.1 Close Out Survey – A close out survey is a thorough evaluation of an area to identify any contamination that exceeds the release criteria.
 - 3.2 RAM – Radioactive Material
 - 3.3 RSS – Radiation Safety Staff
4. **Procedure Details:**
 - 4.1 Remove all RAM. This includes stock vials, research samples, waste, etc. If necessary, submit a request for a waste pick-up.
 - 4.2 Perform a visual survey of the space to ensure that all RAM has been removed.
 - 4.3 Perform a close out survey. An example of a close out survey checklist is included in Appendix A. Meter surveys should be performed at 1 cm from the surface and swipes should be taken over an area of 100 cm². See Radiation Safety Manual (RSM) Section “Monitoring the Lab for Contamination and Using a Survey Instrument” for guidance on performing surveys and swipes.
 - 4.4 If any surveys or swipes are above the release criteria in RSM Section “Survey Requirements”, attempt decontamination and perform another survey and swipe. If decontamination is unsuccessful, the affected area or equipment must be clearly noted on the survey map as contaminated (include the radionuclide, if known). Notify RSS about the contamination when you submit your close out request. Contaminated equipment may be transferred to another AU, if feasible.
 - 4.5 All actions taken and analytical results obtained must be documented and saved.
 - 4.6 Submit a request for a Final RAM Lab Close Out to your assigned Health Physicist or to rad@missouri.edu. Include a copy of your completed close out survey.
5. **References:**
 - 5.1 MU Radiation Safety Manual.
 - 5.2 NUREG-1556, Volume 11, Revision 1, Appendix L – Radiation Safety Survey Topics.
 - 5.3 NRC tie-down document.

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6. Revisions

- 6.1** Rev 01 – 2023-5-1 – New SOP.
- 6.2** Rev 02 – 2024-7-10 – Removed references to Radiation Safety Manual section numbers and replaced with section titles.

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APPENDIX A: Sample Close Out Survey Checklist

1. PRELIMINARY REVIEW

- 1.1 Determine if this close out means that the use of byproduct material has ceased in this building. If so, the building must be evaluated to meet release criteria within 24 months [10 CFR 30.36(d)(4)].
- 1.2 Review historical RAM use to determine which radionuclides were used.
- 1.3 Based on the review, determine the scope of the survey and select appropriate survey equipment.

2. SURVEY

- 2.1 Measure and record background radiation levels.
- 2.2 Survey and swipe all floors and floor drains, working surfaces, sinks and drains, equipment, hoods, and exhaust openings. Use a map of the space to document the swipe locations and survey results (in cpm).
- 2.3 Analyze swipes in the appropriate counter (LSC, gamma counter, proportional counter, etc). Ensure that all swiped areas and items are accounted for on the swipe results.

3. SURVEY REVIEW

- 3.1 Review swipe results to ensure that removable contamination is below the release criteria in RSM Section "Survey Requirements" (i.e., 200 dpm/100 cm² for gamma and beta emitters and less than 20 dpm/100 cm² for alpha emitters).
- 3.2 Review survey results to ensure that all readings are below release criteria (i.e., 0.3 mR/hr at 1 cm from the surface).
- 3.3 Save a copy of the swipe and survey results.

4. RELEASE

- 4.1 Based on the swipe results, completely deface or remove labels from equipment that is not contaminated. Any radiation symbols that are not defaced must be added to radioactive waste. Do not remove any radiation safety postings such as the emergency procedures, NRC Form 3, or door postings indicating a radiation space or area. The RSS will remove these postings once the final close out survey is complete.