



Ames Procedural Requirements

APR 8715.1

Effective Date: ____12/31/2024____
Expiration Date: ____12/31/2028____

COMPLIANCE IS MANDATORY

Subject: Chapter 49 – Laboratory Decommissioning Procedure

Responsible Office: Code QH / Occupational Safety, Health, and Medical Service Division

CHANGE LOG

Status [Baseline /Revision /Cancelled]	Document Revision	Date of Change	Description
Revision	2	4/25/2019	Updated formatting and added “Document Change Log” and Preface. Added requirement in section 49.1.2, for QH to review lab safety plan and chemical inventory as well as interview the PI of the lab being decommissioned. In section 49.3.1.2 added a new requirement for the PI or the Branch Chief to notify QH by filling out the request for laboratory decommissioning inspection form, Appendix F, which should be submitted along with the latest laboratory safety plan and chemical inventory, at least 4 weeks before moving. In section 49.3.1.4, added the requirement for PI or Branch Chief to notify QH when compressed gas(es) are returned to the manufacturer prior to their removal from the Center. Updated appendices
Revision	3	12/31/2024	Update references. Converted Laboratory Decommissioning Clearance Form to ARC Form 914. Converted Decontaminated Equipment Tag to ARC Form 910. The Principal Investigator and the Branch Chief shall notify the Facility Utilization Officer (Code J) 120 days in advance of decommissioning of a laboratory.

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PREFACE

P.1 PURPOSE

- a. This Chapter addresses environmental, occupational health, and safety requirements associated with vacating laboratory spaces and auxiliary spaces serving laboratories.

P.2 APPLICABILITY

- a. This directive is applicable to ARC and associated facilities.
- b. This directive applies to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, grants, or agreements.
- c. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term "shall." The terms "may" or "can" denote discretionary privilege or permission, "should" denotes a good practice and is recommended, but not required, "will" denotes an expected outcome, and "are/is" denotes descriptive material.
- d. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

- a. NPR 8715.1B, NASA Safety and Health Programs

P.4 APPLICABLE DOCUMENTS AND FORMS

- a. APR 1465.1, Mail Management and Shipping Procedures
- b. APR 8715.1 Chapter 44, Compressed Gas Cylinder Safety
- c. ARC Form 749, Waste Pick-Up and Container Delivery Request
- d. APR 8553.1, Ames Environmental Management System
- e. APR 8500.1, Environmental Procedural Requirements
- f. ARC Form 914, Laboratory Decommissioning Clearance Form
- g. ARC Form 910, Decontaminated Equipment Tag

P.5 MEASUREMENT/VERIFICATION

- a. Verification of conformance to requirements in this directive are measured through Center and Responsible Organizational management reviews, self-assessments, and subsequent analysis and reports of conformance to requirements, as well as periodic internal audits.
- b. Verification and measurement for compliance to this directive will be tracked through Ames Voluntary Protection Program (VPP) self-inspection.

P.6 CANCELLATION

- a. APR 8715.1 Chapter 49, Laboratory Decommissioning Procedure, dated April 25, 2019.

Eugene Tu
Director

DISTRIBUTION STATEMENT:

Internal and external distribution. APR 8715.1, Ames Health and Safety Manual, chapters are made available via the procurement website to anyone bidding a job at Ames Research Center. The exceptions are Chapter 10 – Pressure Systems Safety, Chapter 12 – Explosives Safety, and Chapter 23 – Control of Narcotics and Other Controlled Drugs including Alcohol, which are not made public but can be viewed onsite.

CHAPTER 49 LABORATORY DECOMMISSIONING PROCEDURE

49.1 Responsibilities

49.1.1 Managers and Supervisors shall:

- a. Ensure that Principal Investigators (PIs) and laboratory employees using biological, hazardous, and/or radioactive materials are aware of requirements associated with decommissioning of laboratories.
- b. Ensure the notifications listed in paragraph 49.3.1 of this chapter are completed.
- c. Ensure hazardous materials that belonged to the PI, have been removed from the decommissioned laboratory and shared spaces, including freezers in other laboratory or outside the laboratory space.
- d. Ensure their Division Chiefs update their Profile Directory if the laboratories being decommissioned are turned into offices or shops.

49.1.2 The Occupational Safety, Health, and Medical Service Division (Code QH) shall:

- a. Inspect the laboratory upon notification by the PI and the Branch Chief that research activity in the laboratory will be discontinued and inform the PI and the responsible Branch Chief of the inspection results.
- b. Obtain information on work conducted in the lab by interviewing the PI and reviewing the lab safety plan and chemical inventory to identify potential residual contamination that needs to be cleaned up.
- c. Verify laboratory decommissioning requirements are met by completing the Laboratory Decommissioning Clearance Form (ARC Form 914).

49.1.3 The Environmental Management Division (Code JQ) shall:

- a. Upon notification, meet with the designated PI and Branch Chief to ensure they are aware of the environmental requirements associated with laboratory decommissioning, such as hazardous waste disposal requirements and updating hazardous material management business plan (which includes the hazardous material inventory).
- b. Schedule removal and remove hazardous waste materials.

49.1.4 The Radiation Safety Officer (RSO) shall:

- a. Inspect the laboratory if radioisotopes were stored or used there.
- b. Advise the PI and Branch chief on precautions to be taken during transfer of radioactive materials.
- c. Collect all radioactive waste containers not being transferred to a new facility.
- d. Conduct radiological decommissioning surveys of the facility and all equipment used to store or analyze radioactive materials.
- e. Decontaminate all areas that don't meet release criteria and resurvey.
- f. Remove and destroy all labels indicating the presence of radioactivity once it has been confirmed the labeled items/areas are free of contamination.
- g. Notify the PI and branch Chief of the radiological survey results.

49.1.5 Code JS shall:

- a. Ensure Janitorial services listed in the JS Janitorial Service web page <https://js.arc.nasa.gov/jsl/janitorial.html> are completed.

49.1.6 Principal Investigators (PIs) shall:

- a. Complete the notifications specified in section 49.3.1 Arrange for the disposal of all unwanted hazardous or biological materials by submitting a completed Form ARC 749, once they know the laboratory will be decommissioned. If radioactive materials were authorized in the laboratory, take the following specific measures for the transfer or disposal of those radioactive materials before leaving the laboratory/center. These measures include:
- (1) Work with the RSO to survey and decontaminate all areas where radioactive materials were used and/or stored. Equipment in which radioactive materials were used/stored shall also be surveyed and decontaminated as necessary. The surveys shall be documented in the radiation project authorization records for review by the RSO.
 - (2) Transfer remaining radioactive materials to the Radiation Safety Officer or to another permitted radioactive material laboratory if authorized by the RSO. Arrangements can be made, through the RSO, to ship radioactive materials and radioactive equipment off site.
 - (3) Reconcile the radioactive materials inventory.
- (a) Ensure all radioisotope inventory records are updated with the current remaining quantities.
- (b) Ensure radioactive waste containers have an accurate inventory of radioactive material in each waste stream.
- b. Clean all surfaces.
- c. Decontaminate areas and surfaces when appropriate.
- d. Clean out all fume hoods.
- e. Biological safety cabinets shall be cleaned and/or decontaminated.
- f. After any decommissioning survey, the PI will be responsible for all problems that require corrective action.
- g. Comply with APR 8500.1, Closure Plan, if advised by the Environmental Management Division that one is needed.
- h. Ensure JS janitorial staff have access to lab, so they can provide janitorial services.

49.2 General Requirements

- 49.2.1 When spaces are vacated, all hazardous materials (e.g., chemical, radioactive, biological, sharps, and other wastes) shall be removed and disposed of properly.
- 49.2.2 If equipment held hazardous materials, waste products from decontamination shall be disposed of as hazardous waste.
- 49.2.3 All surfaces and storage locations can present potential sources of exposures. These areas shall be properly cleaned and decontaminated when appropriate.
- 49.2.4 Refer to ARC Form 914, Laboratory Decommissioning Clearance Form, for details of requirements.

49.3 Procedures for Laboratory Decommissioning

49.3.1 Notifications

49.3.1.1 The PI \ shall notify Code JQ and the Facility Utilization Officer (Code J) 120 days in advance of decommissioning, refer to Chapter 4 of APR 8500.1, Environmental Procedural Requirement.

49.3.1.2 The PI shall notify Code QH at least four weeks in advance of decommissioning by contacting the Health and Safety customer service representative for your organization, <https://q.arc.nasa.gov/safety-and-health-customer-service>.

49.3.1.3 The PI shall ensure that the hazardous material inventory, including compressed gases, of their laboratories in Code QH's Document Management System, is accurate.

49.3.1.4 The PI shall notify the RSO at least four weeks in advance of decommissioning, to facilitate scheduling of radiological release surveys and planning for the transfer or relocation of radioactive materials.

49.3.1.5 The Branch Chief shall notify the Facility Utilization Officer prior to a laboratory being decommissioned.

49.3.2 Disposition of Hazardous Materials (including chemicals) and Decontamination of Equipment

49.3.2.1 The following actions shall be completed prior to the removal of any hazardous materials:

- a. Complete a Hazardous Waste Accumulation Log Label, Appendix C1.1, in APR 8500.1, for each container removed from the lab. To have chemicals picked up for disposal, use Form ARC 749.
- b. Ensure waste containers are suitable for transport (container compatible with waste, tight fitting caps, outside of containers clean). Contact Code JQ for containers.

Note: Hazardous Waste Accumulation Log labels and additional information regarding disposal of chemicals are available from Code JQ upon request.

49.3.2.2 All chemical shipments to off-site locations shall be packaged by trained individuals and sent in accordance with U.S. Department of Transportation requirements (see APR 1465.1).

49.3.2.3 Clean and/or decontaminate all laboratories and storage areas before vacating. Clean all surfaces with an appropriate decontamination agent and method (the Lab Safety Plan or the Biosafety Operations Manual may contain guidance).

49.3.2.4 Hazardous Material, including chemicals and/or biological storage equipment (corrosive cabinets, flammable liquid storage cabinets, incubators, refrigerators, freezers, centrifuges, cryostats, etc.), shall be cleaned and/or decontaminated prior to moving.

49.3.2.5 Biological safety cabinets shall be cleaned and/or decontaminated.

49.3.2.6 After the appropriate decontamination activity is completed, attach a copy of the Decontaminated Equipment Tag (ARC Form 910) to the piece of equipment/apparatus. If the tag is not completed, it may be assumed that the equipment was not decontaminated and this will delay moving, repairing, renovation, and disposal activities.

49.3.2.7 Any laboratory-specific research apparatus that is no longer needed or wanted must be dismantled, correctly packaged, and removed from the laboratory prior to decommissioning.

49.3.2.8 All compressed gas cylinders are to be removed prior to the closing of the laboratory in accordance with the transport safety requirements of APR 8715.1 Chapter 44.

49.3.2.9 All trash and/or recycling (e.g., papers, rags, empty bottles, boxes, etc.) are to be properly disposed of prior to vacating the laboratory.

49.3.3 Inspection

49.3.3.1 An inspection shall be conducted by Code QH to verify all required laboratory decommissioning actions are completed. Refer to ARC Form 914.

49.3.3.2 The inspection results will be documented by the inspector on the Decommissioning Clearance Form (ARC Form 914) and approved by the Ames Chemical Hygiene Officer.

49.3.3.3 Laboratory personnel must complete any corrective actions identified in the inspection before the laboratory space can be approved for re-use by other personnel.

49.3.3.4 A re-inspection will be conducted after corrective actions are completed. The Chemical Hygiene Officer will sign the Decommissioning Clearance Form to indicate approval based on satisfactory completion of corrective actions.

49.3.4 Radiation Safety Requirements

49.3.4.1 New radioactive material laboratory locations shall be approved by the Radiation Safety Officer prior to the transfer of radioactive materials to those locations.

49.3.4.2 For information on equipment and/or area decontamination, contact the Radiation Safety Officer and refer to APR 8715.1 Chapter 7, Ames Radiation Safety.

49.4 Decontamination

49.4.1 Certain projects may work with chemical, radiological, or biological materials that can contaminate the laboratories if there is a spill, or during the course of their operations. Refer to Appendix H of ANSI/ASSP Z9.11-Laboratory Decommissioning for a list of common contaminants found in laboratories.

49.4.2 Refer to ANSI/ASSP Z9.11 on how to conduct a risk-based decontamination.

49.4.3 The cost of decontamination is the responsibility of the project that causes the contamination.

49.4.4 If the laboratory has not been properly decommissioned and the responsible PI is not available, the cost of decommissioning activities shall be paid by the Directorate that utilized the laboratory facility. These expenses may include but are not limited to decontamination of equipment, disposal of chemicals and cleaning laboratory spaces of old samples or other safety hazards.

49.4.5 If an inspection is conducted by an external agency and abandoned chemicals are found with no routine inspection report, the Directorate that utilized the laboratory facility will be held accountable for any fines NASA receives.

49.5 Information Resources

49.5.1 Contact the following groups for information on the removal of chemical, biological, and radiological equipment.

- a. Code QH: For issues relating to decontamination of biological safety cabinets, biological, chemical, and physical hazard issues, and to schedule a decommissioning survey.
- b. Code JQ: For issues relating to the disposal, storage, and maintenance of hazardous waste.

- c. Radiation Safety Officer: For any issue involving radiological site evaluations and radioactive materials disposal or transfer.

APPENDIX A. DEFINITIONS

Decommissioning	The formal deactivation of a laboratory, assuring the safety of the space for further cleaning, renovation, or occupancy. The decommissioning process begins with a survey by the Occupational Safety, Health and Medical Services Division for those locations where chemicals and biologicals were used. The Radiation Safety Officer will check those locations where radioactive materials were used.
Laboratory	A facility in which research or analytical chemical procedures are performed, where hazardous materials are stored and used in quantities that may easily be handled by one person (container sizes do not exceed five gallons); a workplace where relatively small quantities of hazardous chemicals are used on a nonproduction basis.

APPENDIX B. ACRONYMS

ANSI	American National Standards Institute
APR	Ames Procedural Requirements
ASSP	American Society of Safety Professionals
NRC	Nuclear Regulatory Commission
PI	Principal Investigator
RSO	Radiation Safety Officer

APPENDIX C. REFERENCES

- C.1 The Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6901 et seq.
- C.2 Nuclear Regulatory Commission Regulations, 10 CFR §20.1404 and 10 CFR §30.4
- C.3 Bloodborne Pathogens Program, 29 CFR §1910.1030
- C.4 OSHA Hazard Communication Standard, 29 CFR §1910.1200
- C.5 Occupational Exposure to Hazardous Chemicals in Laboratories, 29 CFR §1910.1450
- C.6 APR 8715.1 Chapter 7, Ames Radiation Safety
- C.7 APR 8715.1 Chapter 13, Chemical Hygiene Program
- C.8 APR 8553.1, Ames Environmental Management System
- C.9 APR 8500.1, Environmental Procedural Requirement
- C.10 Laboratory Decommissioning, ANSI/ASSP Z9.11
- C.11 NRC Consolidated Decommissioning Guide, NUREG-1757