

NASA Ames Research Center  
Environmental Work Instruction (EWI) 7, Closure Plan

---

Responsible Office:  
Code JQ Environmental Management Division Ext. 4-5602, Mail Stop 237-14

<b>Approval Signatures</b>		
<b>Name of Approver (original signature on file)</b>	<b>Title of Approver</b>	<b>Date Approved</b>
Ann Clarke	Chief	02/01/2012

<b>Document History Log</b>			
<b>Status (Baseline/Revision/Cancelled)</b>	<b>Document Revision</b>	<b>Effective Date</b>	<b>Description</b>
Baseline		02/01/2012	Replaces APR 8800.3 Chapter 11

**TABLE OF CONTENTS**

**Preface:**

- P.1 Purpose
- P.2 Applicability
- P.3 Authority
- P.4 Applicable Documents
- P.5 Measurement Verification
- P.6 Cancellation

**Chapter 1: Responsibilities**

- 1.1 Mission Directorates
- 1.2 Tenant/Partner
- 1.3 Environmental Management Division
- 1.4 Facilities Project Manager
- 1.5 Facilities

**Chapter 2: Requirements**

- 2.1 General Requirements for Coordinating Environmental Closure

**Chapter 3: Records**

- Appendix A: Definitions
- Appendix B: Acronyms
- Appendix C: Reports
- Appendix D: Facility Closure Work Flow Plan

**Preface:**

**P.1 PURPOSE**

This Work Instruction sets forth procedure requirements for the design, construction, operation and maintenance, monitoring, and reporting, and closure for hazardous materials storage closure requirements to ensure compliance with applicable Federal, State, and local laws, regulations and executive orders and NASA policies and procedures, and is incorporated by reference into Ames Procedural Requirements (APR) 8500.1, Environmental Procedural Requirements, and APR 8553.1, Ames Environmental Management System.

**P.2 APPLICABILITY**

- a. This work instruction applies to NASA Ames Research Center and Component Facilities for NASA civil servants, on-site support service contractors, and, to the extent determined by their agreements with NASA regarding their tenancy, to resident agency personnel and partners.
- b. A requirement is identified by “shall,” a good practice by “should,” permission by “may” or “can,” expected outcome or action by “will,” and descriptive material by “is” or “are” (or another verb form of “to be”).

**P.3 AUTHORITY**

The major authorities include:

- a. Resource Conservation and Recovery Act (RCRA) of 1976 (42 United States Code (U.S.C.) 6901 – 6692k)., amending the Solid Waste Disposal Act (SWDA) of 1972, and amended by the Federal Facilities Compliance Act (FFCA) of 1992.
- b. National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470 – 470a-2).
- c. 40 Code of Federal Regulations (CFR) Parts 260-270, Solid and Hazardous Wastes.
- d. 40 CFR Part 61, Subpart M (Asbestos-NESHAPs).
- e. 40 CFR Part 273, Standards for Universal Waste Management.
- f. 40 CFR Part 761, Polychlorinated biphenyls (PCB) manufacturing, processing, distributing in commerce, and use prohibitions.
- g. 36 CFR part 800, Regulations Implementing Section 106 of the National Historic Preservation Act.
- h. Executive Order (E.O.) 12088, Federal Compliance with Pollution Control Standards, signed October 13, 1978 (43 FR 47707, October 17, 1978), amended by E.O. 12580, Superfund

Implementation, signed January 23, 1987 (52 FR 2923, January 29, 1987), and revoked in part by E.O. 13148, Greening the Government through Leadership in Environmental Management, signed April 21, 2000 (65 FR 24595, April 26, 2000).

i. E.O. 13423, Strengthening Federal Environmental, Energy, and Transportation Management, signed January 24, 2007 (72 FR 3919, January 26, 2007), codified as § 748, Omnibus Appropriations Act of 2009.

j. E.O. 13514, Federal Leadership in Environmental, Energy, and Economic Performance, signed October 5, 2009 (74 FR 52117, October 8, 2009).

k. California Health and Safety Code, Chapter 6.5, Articles 9 and 12.

l. California Health and Safety Code, Chapter 6.95.

m. California Code of Regulations (CCR), Title 22, Sections 66264.110 through 66264.120.

n. Santa Clara County Hazardous Materials Storage Permit Ordinance, No. NS-517.31.

o. Santa Clara County Toxic Gas Ordinance, NS-517.44.

p. Bay Area Air Quality Management District (BAAQMD) Rules and Regulations.

q. Sunnyvale Municipal Code, Chapter 12.12 Sewer Use Ordinance.

r. Palo Alto Municipal Code, Chapter 16.09 Sewer Use Ordinance.

s. Ames Policy Directive (APD) 8800.1, Real Property Management.

t. APD 8500.1, Ames Environmental Policy.

u. Ames Procedural Requirements (APR) 1700.1, Ames Health & Safety Procedures, Chapter 49, Laboratory Decommissioning.

v. APR 8500.1, Environmental Procedural Requirements.

w. APR 8553.1, Ames Environmental Management System.

x. APR 8800.1, Closure, Caretaker, Maintenance, and Reactivation of Facilities.

#### **P.4 APPLICABLE DOCUMENTS**

a. UN-003, Underground Storage Tank System Closure Permit Application.

b. UN-033, Closure Application for Aboveground Hazardous Materials Storage Facilities.

- c. HMCD-018-1/1, Aboveground Tank Closure Permit Application/Closure Plan.
- d. HMCD-112-2/2, Hazardous Materials Storage Tank System Cleaning/Cutting Application.
- e. UPCF HWF1249, Unified Program Consolidated Form Hazardous Waste Tank Closure Certification.

## **P.5 MEASUREMENT/VERIFICATION**

- a. Metrics will be tracked in Center Level Management Objectives (CLeMO), Safety and Mission Assurance Operating Agreements. Additional metrics may also be tracked for specific Work Instructions.

## **P.6 CANCELLATION**

Replaces APR 8800.3, Chapter 11, Environmental Closure Requirements.

### **Chapter 1: Responsibilities**

#### **1.1 Mission Directorates**

1.1.1 Ames mission directorates shall conduct closure activity in accordance with this work instruction.

#### **1.2 Program and Project Managers, NASA Research Park, Resident Agency Liaison**

Program and Project Managers, NASA Research Park, Resident Agency Liaison responsible for Tenants, Partners, or Resident Agencies shall:

1.2.1 Assure that the closure activity is conducted in accordance with this work instruction unless otherwise stated in the agreement document with NASA, in which case Tenants, Partners, and Resident Agencies are required to obtain Closure Permits from the County of Santa Clara for their facilities.

#### **1.3 Environmental Management Division**

The Environmental Management Division shall:

1.3.1 Inform the Safety, Health & Medical Services Division of the planned activity and of the facility walkthroughs. Coordinate sampling.

1.3.2 Advise for the maximum feasible reuse, recycling, and reclamation of facility, equipment, and materials.

1.3.3 Prepare the required notification, closure plan and application, and post-closure report for submittal and approval by the appropriate regulatory agencies.

- 1.3.4 Input the closure activity into the environmental impact analysis database.
- 1.3.5 Inform the applicable regulatory agency 30 days prior to closure.
- 1.3.6 Coordinate closure inspection by the regulatory agencies.
- 1.3.7 Conduct sampling, as required, to determine if operating the equipment or handling and storing of hazardous materials or waste may have negatively impacted the environment or property. Evaluate sampling data to identify decontamination and/or mitigation options. Prepare sampling report(s) documenting the sampling effort.
- 1.3.8 Inform the permittee of the investigation results in adequate time to allow for funding.
- 1.3.9 Interface with the regulatory agencies.
- 1.3.10 Maintain copies of records indicating disposition of all hazardous materials/waste and the recycling and reclamation opportunities taken.
- 1.3.11 Amend the Building Emergency Action Plan (BEAP), and environmental permits if necessary to reflect changes due to closure.
- 1.3.12 Prepare the Post Closure Report for approval by the regulatory agency, documenting results of any inspections, decontamination, sampling, mitigation and final disposition of any hazardous materials or hazardous waste and associated equipment, and of recycling and reclamation opportunities taken.
- 1.3.13 Inform potentially affected personnel and organizations of all changes in Federal, State, and local regulations.
- 1.3.14 Advise Facilities Project Managers to coordinate with the Ames History Office, Ames Logistics Division, and Ames Facility Historic Preservation Officer regarding closure of facilities, equipment, and other personal property, such as manuals and uniforms, that may be historic.

#### **1.4 Facilities Project Managers**

Facilities Project Managers shall:

- 1.4.1 Close the facility, handling or storage areas, or pieces of equipment to notify the Environmental Management Division (EMD) of its intent to cease operations. Any facility that has been issued a hazardous materials permit, air permit, industrial wastewater discharge permit, has equipment containing oil, PCBs, or other hazardous materials, hazardous waste treatment authorization, or stores or utilizes hazardous materials must contact the EMD of its closure intent.
- 1.4.2 Inform the EMD at least 120 days prior to the closure activity. One-year notice is preferred.

1.4.3 Include costs for closure activities in the organization's budget.

1.4.4 Obtain a NASA Ames Construction Permit for the planned activity.

1.4.5 Coordinate implementation of the following measures:

1.4.5.1 Plan for the maximum feasible reuse, recycling, and reclamation of facility, equipment, and materials.

1.4.5.2 Provide to the EMD information requested and access for inspections during the closure process.

1.4.5.3 Implement requirements identified by the EMD during closure operations, which may include the following:

1.4.5.4 Drain and containerize equipment fluids.

1.4.5.5 Remove or decontaminate all hazardous residues and contaminated containment system components, equipment, structures, etc.

1.4.5.6 Remove and arrange for the proper disposition of hazardous materials and hazardous wastes.

1.4.5.7 Use properly trained personnel to clean up any hazardous waste spills or stains.

1.4.5.8 Provide information regarding proposed disposition of hazardous materials and hazardous wastes.

1.4.5.9 Provide information on the proposed reuse, recycling, or reclamation of equipment or materials.

1.4.5.10 Close hazardous waste treatment systems in a manner that minimizes the need for further maintenance, and controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post closure escape of hazardous waste, hazardous constituents, leachate, contaminated rainfall or run-off, or waste decomposition products to groundwater, surface waters, or to the atmosphere as prescribed in Title 22 California Code of Regulations Section 66264.110.

1.4.5.11 Conduct actions described in the approved Closure Plan in a manner that minimizes the need for further maintenance, and controls, minimizes, or eliminates threats to human health and the environment from residual hazardous materials in the handling and storage areas. Demonstrate that hazardous materials handled and/or stored will be removed, disposed, or reused in an appropriate manner.

1.4.5.12 Provide information documenting actions taken to the EMD upon request.

1.4.5.13 Continue performing routine inspections of remaining equipment containing hazardous materials in accordance with applicable requirements.

### **1.5 Facility Services Managers (FSM)**

The FSM for NASA occupied buildings subject to closure shall:

1.5.1 Request updates to BEAP following procedures at <http://environmentalmanagement.arc.nasa.gov>.

1.5.2 Cooperate with the Environmental Management Division in facilitating closure activities, for example, by providing access to inspect.

### **1.6 Ames Property Disposal Manager**

Ames Property Disposal Manager shall:

1.6.1 Provide documentation of metal recycling as requested by EMD upon request.

## **Chapter 2: Requirements**

### **2.1 General Requirements for Coordinating Environmental Closure**

2.1.1 Plan for the maximum feasible reuse, recycling, and reclamation of facility, equipment, and materials.

2.1.2 Provide to the EMD information requested and access for inspections during the closure process.

2.1.3 Implement requirements identified by the EMD during closure operations, which may include the following:

2.1.4 Drain and containerize equipment fluids.

2.1.5 Remove or decontaminate all hazardous residues and contaminated containment system components, equipment, structures, etc.

2.1.6 Remove and arrange for the proper disposition of hazardous materials and hazardous wastes.

2.1.7 Use properly trained personnel to clean up any hazardous waste spills or stains.

2.1.8 Provide information regarding proposed disposition of hazardous materials and hazardous wastes.

2.1.9 Provide information on the proposed reuse, recycling, or reclamation of equipment or materials.

2.1.10 Close hazardous waste treatment systems in a manner that minimizes the need for further maintenance, and controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post closure escape of hazardous waste, hazardous constituents, leachate, contaminated rainfall or run-off, or waste decomposition products to groundwater, surface waters, or to the atmosphere as prescribed in Title 22 California Code of Regulations Section 66264.110.

2.1.11 Conduct actions described in the approved Closure Plan in a manner that minimizes the need for further maintenance, and controls, minimizes, or eliminates threats to human health and the environment from residual hazardous materials in the handling and storage areas. Demonstrate that hazardous materials handled and/or stored will be removed, disposed, or reused in an appropriate manner.

2.1.12 Provide information documenting actions taken to the EMD upon request.

2.1.13 Continue performing routine inspections of remaining equipment containing hazardous materials in accordance with applicable requirements.

### Chapter 3: Records

Record Name	Title of Responsible Person	Retention Requirements	Location
County of Santa Clara Official Notice of Inspection	EMD Closure Lead	NRRS Schedule 8, 23	EMD Document Tracking System, Post Closure Report
Sample Data	EMD Closure Lead	NRRS Schedule 8, 23	EMD Document Tracking System, Post Closure Report
Bills of lading, bills of sale, TSDf-signed copies of hazardous waste manifests, etc.	EMD Closure Lead	NRRS Schedule 8, 23	EMD Document Tracking System, Post Closure Report

## **APPENDIX A. DEFINITIONS**

**A.1 Abandoned.** There are no plans for future reactivation. A condition in which a facility has been "walked away from" or for which all maintenance activities have been halted. Facility systems and collateral equipment should be considered for excess and/or identified for use at other NASA locations where feasible and cost-effective. See APR 8800.1 for additional requirements.

**A.2 Active Facility.** Any facility that has a specific and present, or near-term, program or institutional requirement. Space utilization would normally be at least 50 percent and/or the usage level exceeds 50 percent of the available time for use.

**A.3 Building Emergency Action Plan (BEAP).** A plan required for facilities storing, handling, or dispensing hazardous materials at NASA Ames; the plan describes the chemicals stored and used, their locations, building hazards, building escape routes, and procedures for emergency response to hazardous materials spills.

**A.4 Closure.** Closure is when a facility no longer uses or stores hazardous materials in its operations at a specific location. Two possible scenarios follow:

A.4.1 When a facility holding hazardous materials storage permit(s) terminates its operations, a closure plan and application must be prepared and submitted to the local regulatory agency to show that steps have been taken to protect human health and the environment against the hazardous materials used at the facility. The facility will show that the hazardous materials have been removed and that there is no residual contamination remaining that may impact persons or the environment.

A.4.2 When a facility that has not been issued a hazardous materials permit but uses equipment containing hazardous materials terminates its operations, a closure plan is prepared and addresses all aspects of the facility operations that may impact human health and the environment. For example, the closure of a wind tunnel may leave lubricating oils in place to protect the equipment for potential future use. In this case, routine inspections of the facility will be performed to ensure that the lubricating oils are not leaking.

**A.5 Closure Plan.** A written plan outlining procedures to be followed to minimize present and future health and environmental hazards; a closure plan is prepared when a hazardous materials storage facility or operational unit discharging to the environment or storing oil, PCBs, or other hazardous materials or tiered permitting unit is to be closed.

**A.6 Facility Services Manager (FSM).** The FSMs and their alternates are the points-of-contact for building related safety issues (such as hazards due to obstructed walkways; poor housekeeping; hazardous stairways; inoperative/damaged fire suppression systems; and so on.) They also have the responsibility to assure that the Building Emergency Action Plan is updated following procedures in the BEAP Environmental Work Instruction.

**A.7 Inactive Facility.** Any facility that has no specific and present, or near-term, program or institutional requirement. An inactive facility may be placed in a "Standby," "Mothballed," or "Abandoned" status. See Ames Procedural Requirements (APR) 8800.1 for additional requirements.

**A.8 Mothballed.** A condition where a facility has been deactivated and appropriate maintenance measures have been taken to prevent deterioration of its vital or essential systems. Higher first year costs would be expected because of preparations for mothballing, but future annual costs should be significantly lower due to reduced maintenance and repair requirements. Total time to deactivate and then to reactivate the facility, including the mothballed period, is expected to exceed 12 months. See APR 8800.1 for additional requirements.

**A.9 Permittee.** Organization to whom the hazardous materials storage permit or hazardous waste treatment authorization air, industrial wastewater, or storm water permit is issued and any authorized representative, agent, or designee of such person, firm, or corporation.

**A.10 Post Closure Report.** A written report that documents the closure procedures that were implemented, including any analytical results, hazardous waste manifests, bills of lading, or other supporting documentation.

**A.11 Standby.** A facility that is temporarily not in use and for which appropriate maintenance measures have been taken to maintain its vital or essential operating systems in a state of readiness or availability for future use. Selective life cycle cost effective facilities maintenance and repair is required. Total time to deactivate and then to reactivate the facility, including the standby period, is expected to be less than 12 months. See APR 8800.1 for additional requirements.

**A.12 Taken Out of Service Owners.** Operators of facilities permanently taken out of service, or which are not monitored in accordance with an approved written monitoring plan, must submit a closure plan application and obtain a closure permit at least 30 days prior to final closure of the facility or aboveground/underground storage tank. Santa Clara County Ordinance (SCCO) Section B11-288(a) B11-288(c).

## **APPENDIX B. ACRONYMS**

APD	Ames Policy Directive
APR	Ames Procedural Requirements
BAAQMD	Bay Area Air Quality Management District
BEAP	Building Emergency Action Plan
CCR	California Code of Regulations
CFR	Code Federal Regulations
CLEMO	Center Leadership and Management Objectives
CY	Calendar Year
EMD	Environmental Management Division
E.O.	Executive Order
FFCA	Federal Facilities Compliance Act
FR	Federal Register
FSM	Facility Service Manager
FY	Fiscal Year
HMCD	Hazardous Materials Compliance Division
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
PCB	Polychlorinated biphenyls
RCRA	Resource Conservation and Recovery Act
SCCO	Santa Clara County Ordinance
SWDA	Solid Waste Disposal Act
TSDF	Transportation, Storage, and Disposal Facility

UPCF Unified Program Consolidated Form

U.S.C. United States Code

**APPENDIX C. REPORTS**

<b>Closure Plan Report</b>		<b>Reported to:</b>	<b>County of Santa Clara</b>
<b>Frequency:</b>	As Needed	<b>Reported by:</b>	Santa Clara County Hazardous Materials Storage Permit Ordinance, No. NS-517.31
<b>FY or CY Data:</b>	Not Applicable		
<b>Report Due:</b>	30 days prior to start of closure activities		
<b>Internally Report to:</b>	Dan Winningham, EMD, and Raymond Walker, ISSI, Project Manager		
<b>Data Source</b>	<b>Primary Contacts</b>	<b>Contact(s) For Past Reports</b>	<b>Data Required</b>
Facilities Engineering and Real Property Management Division	Chief, Facilities Engineering and Real Property Management Division Chief, Facilities Engineering Branch Chief, Plant Engineering Branch Chief, Logistics and Documentation Services Division Chief, Wind Tunnel Division	Peter Goldsmith (Facilities Engineering Branch); Tim Gafney (Facilities Engineering Branch)	Closure activities information, i.e. work plans, drawings, etc.
			<b>Units</b> NA

## APPENDIX D. FACILITY CLOSURE WORK FLOW PLAN

### FACILITY CLOSURE WORK FLOW PLAN

