

**Forest Service Handbook
National Headquarters (WO)
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Forest Service Handbook 2109.14 – Pesticide-Use Management And Coordination Handbook

Chapter 40 - Storage, Transportation, and Disposal

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Responsible Staff:

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Superseded Document(s): 2109.40,40 Contents, Amendment 2109.14-94-1, December 6, 1994; 2109.40, 40, Amendment 2109.14-94-1, December 6, 1994

Digest: Following is an explanation of the changes throughout the directive by section.

40: Makes minor technical, formatting, and editing changes throughout the chapter.

41: Changes caption from “Storage, Transportation, and Disposal” to “Storage”. Removes Exhibit 01 since the exhibit has been classified as Forest Service form FS-2100-7.

41.1: Changes caption from “Storage” to “General Requirements for Permanent and Temporary Storage”. Modifies, clarifies, and adds direction to emphasize that all storage facilities, whether permanent or temporary, must follow an extensive list of requirements. Emphasizes that temporary storage is meant for project-level pesticide storage and should not be a replacement for permanent storage facilities. Updates references, adds technical specification references, and removes obsolete references. Clarifies when flammable-materials storage cabinets or facilities are required. Recodes to this section direction previously set out in 41.11, 41.14, and 41.15 as appropriate.

41.11: Removes code, caption, and direction and recodes to 41.1.

41.12: Removes code, caption, and direction and recodes to 41.3.

41.13: Removes code, caption, and direction and recodes to 41.2.

41.14: Removes code, caption, and direction and recodes to 41.1 or 41.2 as appropriate.

41.15: Removes code, caption, and direction and recodes to 41.1 or 41.2 as appropriate.

41.2: Establishes new code, and recodes to this section caption and direction previously set out in 41.13. Recodes direction previously set out in 41.14 and 41.15, as appropriate.

41.3: Establishes new code and recodes to this section caption and direction previously set out in 41.12. Edits the description of temporary storage to emphasize that it is intended for project-specific storage of pesticides necessary for the current field-season.

42.2: Updates Department of Transportation (DOT) transport regulations to reflect current requirements for transporting pesticides as well as pesticide waste.

43: Clarifies direction that coordination with the forest or regional hazardous materials coordinators is necessary when considering the disposal of excess pesticides and pesticide waste.

43.1: Adds direction that disposal of empty pesticide containers by burning or burying the containers is prohibited on National Forest System lands.

Table of Contents

41 - Storage	4
41.1 - General Requirements for Permanent and Temporary Storage	4
41.2 - Permanent Storage	9
41.3 - Temporary Storage.....	11
42 - Transportation.....	11
42.1 - General Requirements	11
42.2 - Department of Transportation Regulations.....	12
43 - Disposal.....	13
43.1 - Disposal of Pesticide Containers	13
43.2 - Disposal of Excess Pesticides	14

Follow the direction in this chapter to ensure that proper storage, transportation, disposal, and handling precautions are implemented to prevent and control pesticide spills. Disposal of pesticides classified as hazardous wastes is regulated under 40 CFR Parts 260-262, and 273 (implementing regulations for the Resource Conservation and Recovery Act).

If a spill or accident occurs, implement proper spill cleanup and disposal to minimize possible adverse impact to the environment, public, or employee health and safety. This chapter provides:

1. Guidelines for pesticide storage and transportation;
2. Guidelines for routine inspection of storage areas and vehicles for leaking or damaged containers;
3. Guidelines and procedures for pesticide disposal; and
4. Procedures for pesticide spill prevention.

The direction in this chapter is intended for Pesticide Coordinators and others who have pesticide storage, transportation, and disposal responsibilities for projects or incidents.

Contracts for pesticide application services, when used, must include requirements for contractor storage, transportation, and disposal of project pesticides. Safety requirements within the contract should include support to the Contracting Officer's Representative (COR) by the unit Safety Manager, or other safety professional, to ensure contract language meets or exceeds governing requirements related to storage, transportation, and disposal.

41 - Storage

Apply the following requirements, unless applicable State or local requirements are more stringent. In all cases identify and implement applicable State and local regulations when they are more stringent.

Limit the quantity of pesticides held in storage to amounts planned for near-term use. Stockpiling of pesticides for potential future use is discouraged.

Forest Service form FS-2100-7 should be used for inspecting pesticide storage facilities.

41.1 - General Requirements for Permanent and Temporary Storage

Use proper storage techniques to eliminate or minimize risk of accidental poisonings, environmental contamination, creation of hazardous materials disposal issues, and danger of fire.

Follow these practices to ensure safe storage of pesticides:

1. Know and follow the most restrictive requirements among Federal and State laws, and Forest Service policy (FSM 2150) regulating pesticide storage.
2. Select a storage site that limits potential harm to human health and the environment due to spills, contaminated runoff, or fires.
 - a. Site storage facilities so that any outdoor stormwater and meltwater drains away in order to prevent flooding.
 - b. Avoid locating storage facilities on sandy soils, karst formations, or fractured bedrock where accidental spillage could leak into groundwater.
 - c. Site storage facilities so that they are readily accessible to authorized emergency responders.
3. Restrict access to storage facilities to authorized persons only. Pesticide storage facilities must be kept locked; and a key log maintained and updated where appropriate. Provide additional security measures, such as additional fencing or outdoor lighting, if necessary, to prevent unauthorized access.
4. For storage of pesticides, conform to specifications of National Fire Protection Association (NFPA) 400. Sign those pesticide storage facilities on all approachable sides with signs stating “DANGER – PESTICIDE STORAGE”. If any pesticides to be stored display the skull and crossbones insignia and the “danger” signal word on the label (considered a poison), then the signs should also include the word “POISON”.
5. Post pesticide storage facilities in accordance with NFPA Code 704, Standard System for the Identification of the Hazards of Materials for Emergency Response (“fire diamond”). Work with local fire/emergency response authority to determine the numbering (on the signs) and position of these signs on the buildings.
6. Store pesticides in cool, dry storage areas which are well-ventilated. Ventilation might be non-mechanical or mechanical. However, if flammable and combustible liquids are stored, mechanical ventilation should be used if non-mechanical ventilation is insufficient to prevent the buildup of potentially flammable or combustible fumes (29 CFR 1910.106). Where mechanical ventilation is used, equip the facility with an exterior switch so personnel can manually purge the building prior to entry. When using mechanical ventilation, post a sign to inform personnel of the minimum purge time prior to entry.
7. Protect stored pesticides from freezing temperatures, rain, and direct sunlight.
8. Follow the manufacturer's recommendations regarding other storage precautions as listed on the pesticide label and the safety data sheet (SDS) [29 CFR 1910.1200(g)].

9. Construct the facility to contain spillage from the largest bulk container to be stored in it, plus 25 percent. This can be accomplished by floor curbs or spill containment devices such as spill pallets, trays, pans, or by using approved pesticide or flammable materials storage cabinets. If containment is provided by a sump (not recommended), it must meet the capacity requirement, must not have an automatic pumping system, and must be purged as needed. Materials purged from a sump must be treated as waste material and be disposed of as excess pesticide or hazardous waste as appropriate. Sumps must be inspected annually to ensure that they are watertight.

10. Equip facility with one or more ABC-type (all purpose) portable fire extinguisher(s) in a visible, readily accessible, exterior location, and inspect it regularly.

11. Prepare and post a safety plan (FSH 2109.14, ch. 10, sec. 16) which includes a pesticide spill emergency plan for use in the event of an emergency (FSH 2109.14, ch. 60). Copies of this plan should also be maintained in the unit's administrative office, fire dispatcher's desk, or other readily accessible location, and reviewed and updated periodically to ensure current information is accurate.

12. Prominently post the following telephone numbers in a readily accessible exterior location and maintain the listing together with the safety plan at all locations where it is maintained.

- a. National [Spill] Response Center (NRC) toll-free telephone number (1-800-424-8802);
- b. Telephone number and location of the local poison control center;
- c. Telephone number and location of the local fire department; and
- d. 24-hour telephone numbers for persons responsible for the storage site. Update contact information for primary and alternates as needed.

13. Prepare and maintain readily accessible spill kits at all facilities to allow rapid cleanup of an accidental spill of pesticides (FSH 2109.14, ch. 60).

14. At the time of purchase, obtain from the manufacturer or distributor a specimen label and a safety data sheet (SDS) for each pesticide formulation.

- a. Post a set of labels and SDSs on or immediately near the storage facility. Posted materials should be protected from the weather. Copies of all labels and SDSs should also be available at readily accessible locations (the unit's administrative office, fire dispatcher's desk, or other accessible location) for use in the event of an emergency.

15. Outside of pesticide storage facilities, protected from the weather, post and maintain an inventory of the pesticides stored within. The inventory should be dated and signed by the preparer. This inventory should contain an additional sheet for noting removal and restocking of pesticides, to keep it current.

16. Store pesticides and their containers off the ground.
17. Store pesticides away from food, feed, seed, potable water, clothing, oil-based paints, flammable liquids, and fertilizer (except pesticide-fertilizer combinations). Do not allow anyone to eat, drink, or smoke in or near facilities where pesticides are stored.
18. Use of wooden shelving and work surfaces should be avoided. Wooden shelving and work surfaces can easily become contaminated and cannot be readily decontaminated, thus potentially becoming hazardous waste (HAZWASTE). If wooden shelving or other surfaces are already in place, impervious containment trays must be used to protect the wood from contamination.
19. Shelving above head height must be rated for load strength and the appropriate load limits must be posted.
20. Store pesticides in original containers with legible and visible labels. Do not store pesticides in unmarked containers at any time.
 - a. Mark the date of storage on each container.
 - b. Ensure that labels are plainly visible to permit ready access and inspection.
 - c. Protect pesticide container labels so they remain legible.
 - d. Do not store pesticides in containers meant for food, feed, or beverages, or in any other unauthorized containers.
21. Pesticides containing the same active ingredient should generally be stored together, apart from dissimilar products, with signage displaying the common name of the active ingredient(s).
22. Store non-flammable but volatile pesticides in tightly sealed containers and in areas separate from other easily contaminated pesticides. Pesticides must be adequately separated to avoid cross-contamination or adverse reactions.
23. Store flammable pesticides, and segregate incompatible materials, in accordance with the Forest Service Health and Safety Code Handbook (FSH 6709.11) NFPA Flammable and Combustible Liquids Code (30), and OSHA (29 CFR 1910.106) requirements. For additional material storage guidance consult Forest Service Everyday Hazmat Users Training Guide #0471-2810-MTDC.
24. Keep appropriate eyewash/shower facilities readily available at temporary and permanent storage facilities, mixing stations, and work project locations.
 - a. When storing pesticides, an eyewash station meeting the American National Standards Institute (ANSI) Z358.1 and when storing corrosive pesticides OSHA 29 CFR 1910.151 (c) standards must be followed.

- b. All eyewash stations and emergency showers must be maintained and routinely tested for functionality, and equipment (both installed and transportable) should be replaced according to OSHA and manufacturer's specifications.
25. Keep clean water, labeled "WASHWATER ONLY," available at all storage facilities for emergency decontamination purposes.
- a. Maintain sufficient clean water, soap, and towels available on site for decontamination of personnel.
 - b. When storing pesticides that are corrosive or severely irritating to the skin, or highly toxic via dermal absorption, an emergency shower that meets the American National Standards Institute (ANSI) Z358.1 standard is required.
26. Personal protective equipment (PPE) and clothing must be stored separately from pesticides; or if stored within the storage facility, must be protected from potential spill or vapor contamination.
27. At the completion of a project or day's work,
- a. All unused chemicals and empty containers must be returned to and stored in a locked permanent (FSH 2109.14 sec. 41.2) or temporary (FSH 2109.14 sec. 41.3) storage facility. Hold empty labeled containers in the pesticide storage facility until final disposal (FSH 2109.14 sec. 43).
 - b. All used tools and PPE must be cleaned prior to being returned to storage.
 - (1) Collect all rinsate from tool cleanup into a drip pan and store in a marked drum for proper use as a diluent, or for disposal. RCRA-compliant labeling is required after a decision is made that collected pesticide rinsate cannot be reused.
28. Check containers routinely to ensure that lids are tight and containers are not damaged or leaking. At least annually inspect storage facilities and document inspection results using Forest Service form FS-2100-7, and take prompt appropriate corrective actions. Various State and local regulations might require more frequent inspections of pesticide storage areas.
29. Handle leaking or damaged containers as follows:
- a. Separate clean, undamaged containers from those that are leaking and implement any appropriate spill response actions..
 - b. Isolate leakage-contaminated containers from leaking containers, for later cleanup.
 - (1) Clean any spilled pesticides from the outside of contaminated containers by using appropriate decontamination or cleaning solutions (see product SDS).

(2) Collect all residues in a drip pan and store in a marked drum for proper use as a diluent, or for disposal. RCRA requirements are triggered if the material is deemed a waste.

(3) Waste pesticides classified as hazardous in 40 CFR Part 261, or applicable State and/or local hazardous waste management regulations, must be handled as hazardous waste when disposed. Hazardous waste accumulation, marking, and disposal requirements are in 40 CFR Parts 262 and FSH.2109.14, section 43. Forest and units need to also check State and local hazardous waste management requirements as they may be more stringent than Federal regulations.

c. If container leakage occurs or is probable, the container(s) must be overpacked (repacked), even if disposal is planned.

(1) Repackage damaged or leaking pesticide containers by overpacking in approved containers.

(2) Label overpacked pesticide containers with facsimiles of original labels.

(3) Include the date of repackaging on the outside of the new container.

(4) Clean all contaminated areas after completing the repackaging operation.

(5) Clearly mark empty containers or containers of surplus pesticides and cleanup materials awaiting disposal "FOR DISPOSAL ONLY" (40 CFR Parts 262 and FSH.2109.14, sec. 43).

(6) Properly dispose of, or recycle if permitted, emptied, and rinsed pesticide containers.

30. Notify local fire departments of the location, types, and quantities of pesticides being stored.

a. Supply them with copies of pertinent labels and safety data sheets.

b. Advise local firefighting officials that special hazards are involved when fighting pesticide fires and that it is sometimes best, where no other significant resources are threatened, to allow the fire to burn itself out.

c. Advise firefighters that self-contained, positive-pressure breathing apparatus and training are required in order to fight pesticide fires.

41.2 - Permanent Storage

In addition to the general requirements above for all storage facilities (sec. 41.1), the following requirements must be met for all permanent storage facilities.

1. Site the facility outside the 500-year floodplain where flooding is unlikely, if feasible.
 - a. Site facility a minimum of 400 feet (preferably downgradient) from wells, and a minimum of 200 feet from surface water.
2. Equip pesticide storage facilities with appropriate wiring, equipment, and fixtures as specified in the National Electrical Safety Code (FSH 7309.11).
 - a. For storage facilities in which pesticide labeled 'flammable or combustible' is to be stored, a higher standard might need to be met. Construction must meet the National Electrical Safety Code and the requirements for facility development and operation (FSM 7310).
 - b. Locate structures a sufficient distance from other structures to meet national code (NFPA code 30 and other relevant codes; FSH 7309.11).
3. When water piping within the facility is directly connected to a potable water system, provide an air gap or reduced pressure principle backflow assembly (RPBA) on the supply line.
4. Construct pesticide storage facilities with flooring that is continuous and impervious to pesticides. If spill containment devices are not utilized, the floor must slope to one or more liquid-tight collection points that allow spilled or deposited materials to be easily removed. The floor must be constructed of materials that:
 - a. Must have sufficient thickness and chemical resistance to contain a release until it is recovered;
 - b. Must be chemically compatible with the materials being stored; and
 - c. Must be properly sealed to prevent leakage.
5. Dispensing of pesticides inside a permanent storage facility must only be allowed if the facility is adequately ventilated either by mechanical or non-mechanical means to prevent exposure of handlers to fumes at or above the permissible exposure limits established by OSHA.
6. In the case of flammable or combustible pesticides (flash point <200 degrees F) the structure or building must meet the requirements for a flammable, combustible storage inside room authorized for dispensing flammable, combustible liquids as described in OSHA Standards 29 CFR 1910.106.
7. In addition to the signing required on buildings, provide identification and warning signs on rooms, approved pesticide storage cabinets or approved flammable storage cabinets, to advise of the contents of the stored material.

41.3 - Temporary Storage

In addition to the general requirements for all storage facilities (sec. 41.1), the following requirements must be met for all temporary storage facilities.

Use temporary storage facilities to store pesticides needed on-site for project operations. (Temporary storage must not be used to replace permanent facilities.) Temporary storage facilities might include research laboratories, fenced compounds, truckboxes, empty paint sheds, storerooms, and warehouses, where provisions are made to prevent access by unauthorized personnel or damage to the pesticide by weather. However, do not store pesticides inside vehicles such as SUVs or other types of enclosed vehicles

1. Temporary storage sites must be located where flooding is unlikely and where contamination of any water system by runoff can be prevented.
2. Post appropriate identification and warning signs on rooms, buildings, fences, vehicles, or storage cabinets being used as temporary storage facilities to disclose the nature of the stored material.
3. Temporary storage of pesticides for immediate use is limited to the quantities needed for the current field season's activity of a specific project.

42 - Transportation

Be sure to check current hazardous material (HAZMAT) transport law, and applicable State and local law before transporting other than incidental amounts (see section 42.2) of pesticide mixes (off-the-shelf product plus any water or carrier already field mixed at the time of transport) as these rules change [consult Forest Service Health and Safety Code Handbook, 6709.11, ch. 60; and the unit Safety Office].

42.1 - General Requirements

Accidental spills can occur during the transport of pesticides. Observe relevant safety precautions of the Forest Service Everyday Hazmat User's Training Guide #0471-2810-MTDC to minimize such incidents and mitigate their effects when they do occur, including:

1. Transport from the storage facility only the quantity needed for the day's operations. Return leftover pesticides to an approved pesticide storage facility at the end of each day.
2. Do not transport pesticide containers in the same cargo area with food, livestock feeds, clothing, or potable water.
3. Do not leave vehicles that are transporting pesticides unattended unless the pesticides are locked in an attached transport/storage unit.

4. Keep pesticides in truck beds or trailers isolated from drivers and passengers. Do not store pesticides inside vehicles such as SUVs or other types of enclosed vehicles.
5. Trucks with wooden bed platforms must not be used, as spills in these trucks would generally require replacement of the platform planking for complete decontamination.
6. Transport pesticides in their original containers which must be tightly closed and properly secured to prevent shifting and spills.
7. Make periodic checks en route to ensure that no spillage and no punctures have occurred during transport. The outside of containers must not be contaminated with pesticide.
8. Cover pesticide containers to protect them from direct sunlight while in transit to the worksite, and place them (moving them as necessary) to keep them in the shade. Excessive heat can cause expansion of certain pesticides, resulting in container rupture or violent discharge when opened.
9. Carry in the vehicle copies of the accident and spill plan, as well as pesticide labels and SDSs for all products being transported regardless of the volume of pesticide being transported.
10. Maintain a manifest of each pesticide cargo. Identify the amount of pesticide being transported, number and size of containers, product name, chemical name, and their EPA registration numbers.
11. Service containers (any container used to hold, store, or transport a pesticide diluted preparation) must be labeled as follows:
 - a. Product name preceded by the word "Diluted";
 - b. EPA registration number preceded by the words "Derived From";
 - c. Name and percent of active ingredient as diluted; and
 - d. Signal word(s) from registered label.
12. Follow the specific procedures described in project safety plans (FSH 6709.11, ch. 60, and FSH 2109.14, sec. 61.1) if a pesticide accident or spill occurs.

42.2 - Department of Transportation Regulations

Transportation of hazardous materials and hazardous wastes is regulated by the U.S. Department of Transportation (DOT). Although not all pesticides are classified as hazardous materials, certain pesticides must be properly classed, described, packaged, segregated, marked, and labeled for shipment when shipped in amounts above certain threshold quantities as defined by DOT. Confer in advance with local unit Safety Office to identify applicable requirements (for

example, container types) and limitations (for example, maximum cargo amount) for proposed transport of pesticides in appropriate vehicles. Vehicle placarding and manifesting requirements might apply, and drivers must have required training (see FSM 2161.44) and have the appropriate endorsements on their motor vehicle driver's license. Forest Service employees require a valid State driver's license and a U. S. Government motor vehicle operator's identification card (Form OF-346) to drive a Government vehicle

43 - Disposal

Pesticide applicators encounter two basic situations in which waste disposal might be necessary. The first situation involves the disposal of empty pesticide containers. The second situation involves the disposal of excess pesticides or other related waste material (contaminated clothing, sump waste, and so forth). Follow the pesticide disposal requirements and recommended procedures in 40 CFR 273 when disposing of pesticide containers or pesticide wastes which are not classified as hazardous wastes. For waste pesticides classified as a hazardous waste, follow the disposal requirements in 40 CFR Parts 261-265 and applicable State and local hazardous waste management regulations. Contact the Regional Hazardous Materials Coordinator and the Regional Pesticide Coordinator/Specialist for further instructions on disposing of pesticides. Disposal of excess pesticides requires compliance with Environmental Protection Agency (EPA) and State hazardous waste regulations. Hazardous Materials Coordinators will assist in the classification of wastes and the determination of proper disposal methods.

43.1 - Disposal of Pesticide Containers

Empty pesticide containers must be handled cautiously. These containers can represent a hazard to humans and the environment. Follow all instructions on the pesticide label and the safety data sheet (SDS) to reduce the hazard associated with empty containers.

Take the following precautions in disposing of empty pesticide containers:

1. Maintain a regular system of disposal. Do not accumulate empty containers unless the containers are to be recycled by a pesticide container recycling program. Do not send pesticide containers to household recycling programs, unless they specifically allow pesticide containers and are authorized to accept, and agree to accept, containers from the Forest Service.
2. Prior to rinsing the exterior of containers, handle empty pesticide containers with the same caution accorded the active ingredient, including the use of required personal protective clothing and equipment specified on the pesticide label.
3. Triple rinse empty containers with the pesticide carrier and pour the washings back into the spray tank for application to the project target area. Do not pour rinse washings onto the ground. An alternative is to use a single pressure rinsing for 30 to 60 seconds, collecting the rinsate for appropriate use as a diluent or disposal.

4. Do not reuse empty pesticide containers for unauthorized purposes. Encourage the pesticide supplier to recycle empty containers.
5. Retain properly labeled empty containers in a secure pesticide storage facility until adequate disposal can be arranged.
6. Do not burn or bury empty pesticide containers (bags, drums, bottles, and so forth) on National Forest System lands. Do not burn, cut, crush, or punch holes in pressurized or aerosol containers, as they might explode. Crush and punch holes in other metal and plastic containers, break glass containers, and dispose of container lids separately from containers when depositing them in a landfill to ensure against reuse. Landfill operators generally prefer to receive crushed containers, since handling and disposal are easier and crushed containers can contain only small amounts of rinsate or other residue.
7. Follow State and local regulations regarding pesticide container disposal.

43.2 - Disposal of Excess Pesticides

When considering disposal of excess pesticide, give first preference to procedures designed to recover some useful value from these materials. The preferred approach is to use the pesticide for the purpose originally intended, provided this use is still legal. Explore all possibilities for transfer of significant quantities of leftover pesticide to a unit or subunit planning similar work. However, if time and circumstances permit, this material may be reported to General Services Administration (GSA) to optimize use of this already-acquired material. When an item that is determined to be extremely hazardous property becomes excess, the holding agency should notify the appropriate GSA Regional Personal Property Office, which will determine if the property should be reported using Report of Excess Personal Property, Standard Form (SF) 120 or another method (GSA 41 CFR 102—40.55). Another alternative is to return the material or containers to the manufacturer for potential reuse.

If use or transfer of excess pesticides is impossible, the excess pesticides become waste and triggers hazardous waste management regulations. Contact the unit Hazardous Materials Coordinator and the Regional Pesticide Coordinator/Specialist for further instructions on disposing of pesticides. Disposal of waste excess pesticides requires compliance with EPA (40 CFR 273.3) and State hazardous waste regulations. Unit Hazardous Materials Coordinators will assist in the classification of wastes and the determination of proper disposal methods.

Do not bury any containers of excess waste pesticides on National Forest System lands.

Refer also to FSM 2163 and FSH 6709.11, section 61.71c.