

**Armed Forces Pest Management Board**  
**TECHNICAL INFORMATION MEMORANDUM NO. 15**

\*\*\*\*\*

**PESTICIDE SPILL PREVENTION**  
**AND MANAGEMENT**

\*\*\*\*\*

Published and Distributed by  
DEFENSE PEST MANAGEMENT INFORMATION ANALYSIS CENTER  
Forest Glen Section  
Walter Reed Army Medical Center  
Washington, DC 20307-5001

June 1992

## ACKNOWLEDGEMENT

This revision of Technical information Memorandum (TIM 15) was prepared through the efforts of the Armed Forces Pest Management Board Pesticides, Equipment and Real Property Committees.

Real Property Committee, Chaired by Mr. William Gebhart provided technical assistance and guidance for the revision of this TIM.

## DISCLAIMER

TIM 15 discusses specific proprietary products in a few cases where examples are needed. Such information does not constitute a recommendation or an endorsement of these products by the Department of Defense. Neither should the absences of an item be interpreted as DoD disapproval.

# PESTICIDE SPILL PREVENTION AND MANAGEMENT

## TABLE OF CONTENTS

Acknowledgement .....	1
Disclaimer.....	2
INTRODUCTION AND PURPOSE .....	1
LEGAL REQUIREMENTS .....	2
SPILL PREVENTION.....	2
A. General Procedures .....	2
B. Storage Procedures .....	3
SPILL CONTINGENCY PLANNING.....	4
SPILL EMERGENCY PROCEDURES .....	6
A. Identification .....	6
B. Safety and First Aid .....	6
C. Care of Injured .....	6
D. Site Security .....	7
E. Containment and Control .....	7
F. Pesticide Spill Reporting .....	8
G. Cleanup .....	8
H. Decontamination .....	9
I. Disposal .....	10
POST-SPILL PROCEDURES.....	10
A. Sample Collection and Analysis .....	11
B. Investigation of Cause .....	11
C. Disposal .....	11
INFORMATION AND ASSISTANCE.....	11
REFERENCES .....	12
APPENDIX A .....	A-I
APPENDIX B .....	B-I
APPENDIX C .....	C - I

## I. INTRODUCTION AND PURPOSE

Practically all DoD facilities routinely do pest control operations, The magnitude of these operations depends largely on the size of the facility and whether the work is contracted or done in-house. Both dilute and concentrated pesticides are used. Use of these chemicals involves handling, storage, application and disposal of various pesticides.

Most bases/installations use a wide variety of pesticides ranging from those that are practically nontoxic for mammals to those that are highly toxic. Included are insecticides, herbicides, fungicides, fumigants, nematocides, rodenticides and other miscellaneous pesticides. Each of these pesticides has particular characteristics that require special attention. This document does not take into account the special characteristics of each group to any great extent. It was developed as a basic guideline to developing plans for pesticide spill prevention, control and cleanup.

The probability of a pesticide spill can be effectively reduced by an education program training personnel in:

- a. Pesticide spill prevention, control and cleanup procedures.
- b. Methods of handling and storing pesticides.
- c. Shop safety and fire regulations

Additional spill prevention practices should include:

- a. Properly securing pesticides in vehicles and shops.
- b. Inspecting storage areas for leaking or damaged containers on a monthly basis.
- c. Adequate advance contingency planning for controlling and cleaning up spills.
- d. Providing and properly maintaining spill kits at all pesticide storage and mixing facilities and pesticide vehicles.

In spite of planning and training, spills do occur. Typical spills range from a 1-gallon service container falling off a vehicle to several 55-gallon drums punctured by a forklift. The worst case of a spill would be exploding containers in a fire. The problem for all persons concerned is the management of the spill, the cleanup and the proper disposal of all the residual material.

## II. LEGAL REQUIREMENTS

Most pesticide spills occur in areas such as loading docks, warehouses and mixing areas. If the spill did not result in a release to the environment (i.e., no lost material such as might occur in a confined area, diked pad with no outlet, or on a concrete floor of an enclosed facility) and there is no threat to air, soil, or water environments, then the spill is not reportable to external regulatory agencies. If the spill occurred under uncontrolled conditions such as onto grounds outside the shop and the amount spilled equaled or exceeded a so-called reportable quantity (RQ) of Part 117 of the Clean Water Act (CWA) or Part 302 or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), then the spill must be reported off-base because it affects the environment. This reporting procedure will be explained later.

Consequently, report all spills to your chain-of-command regardless of the amount spilled. Base/installation environmental engineers/coordinators can help in making a RQ determination and in properly reporting hazardous substance releases to regulatory agencies. Failure to report a RQ spill is a violation of Federal law.

Regulations promulgated under the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 1510) require federal agencies to develop plans and procedures for containment and cleanup of accidental discharges of hazardous substances. In compliance with these regulations, pesticide facilities shall be included in base/installation hazardous substance spill contingency plans. Procedures for the handling and disposal of spill cleanup residues according to requirements of the Resource Conservation and Recovery Act (RCRA) also should be addressed in the Contingency Plan.

## III. SPILL PREVENTION

The best means by which a spill can be reduced or prevented is to take precautionary measures such as providing adequate storage facilities for all pesticide chemicals, monthly inspection of these facilities, and ensuring that emergency equipment is on hand for spill cleanup. The following guidelines should be followed for reducing the probability and severity of a spill:

### A. General Procedures

1. Train personnel in proper procedures for handling pesticides during receipt, storage, formulation, loading, application and disposal.
2. Advise and train pest control personnel in proper spill prevention, emergency response and containment procedures.
3. Identify locations and operations where spills are likely to occur.

4. Prepare pesticide spill emergency response and spill control countermeasure plans for shops and storage areas consistent with the total hazardous materials management and spill contingency plans for the facility, i.e. Navy Hazardous Materials Management Guide (Reference 14).
5. Post emergency phone numbers in conspicuous locations.
6. Prepare and maintain spill kits
7. Inspect storage areas monthly and spill kits quarterly.

## **B. Storage Procedures**

Proper storage of pesticides should be accomplished employing the following procedures:

1. Store all pesticides with labels plainly visible. Containers should be checked at least monthly to ensure that lids are tight and containers are not damaged. They should be stored in rows off the ground to provide effective access.
2. Incompatible pesticides, such as herbicides and insecticides, must be stored separately, maintaining sufficiently safe segregation, in order to avoid cross-contamination or adverse reactions, for example, phenoxy and urea herbicides should be physically separated (not share the same air ventilation system) from all insecticides. Where separate air supplies are not feasible, the pesticides should be arranged so that clean air flows continuously from the insecticides past the herbicides and out of the facility.
3. Containers must be stored in well ventilated (six room air changes per hour), dry storage areas. Temperatures should be between 40°-100° F. Stored pesticides should be protected from freezing temperatures and direct sunlight.
4. Emergency procedures (fire, spill. etc.) should be conspicuously posted near work areas and exits. A complete inventory of the pesticides contained in the storage area should be given to the local fire department along with the name and phone number of the pest control shop supervisor and building custodian.
5. Containers found leaking or damaged should be handled as follows:
  - (a) Don appropriate protective equipment and ensure that backup responders are available.
  - (b) Separate clean undamaged containers from those that are leaking.

(c) Isolate, for later cleanup, any containers that have been contaminated by leakers.

(d) Leaking containers should be repackaged. Overpacking may be employed only if the pesticide and its container are being prepared for disposal. Repackage when necessary by obtaining containers of the same type used originally to store or transport the pesticide chemicals. The numbers on bottom of the containers, either Department of Transportation (DOT) or Federal Specifications (Fed. Spec.), refer to the proper container specifications to be used for repackaging. Broken bags can be placed in heavy-duty plastic bags and sealed with twist ties. Leaking drums can be temporarily sealed using epoxy glue, fiberglass patch kits, or other suitable materials on hand.

(e) All labeling must be duplicated on the repackaged pesticide containers.

(f) Transfer contents of each leaking container by pouring or siphoning the contents into the new container. When pouring, use a wide-mouth funnel. Use only a mechanical siphon. NEVER START SIPHON BY MOUTH. Use a forklift to lift large containers. Mechanical pumps also can be used for transferring liquids to new containers.

(g) Clean any spilled pesticides from the outside of contaminated containers by using decontamination and/or cleaning solutions (household detergent). Collect all ~~rinseate~~ in a drip pan and store in a marked drum for proper disposal. Clean the inside of the damaged container by triple rinsing. All collected spilled materials may be used in accordance with the label. All ~~rinseate~~ can be saved for future use as a diluent. Refer to the NEPSS Hazardous Waste Disposal Guide (Reference 4) for proper disposal guidance.

(h) All contaminated areas should be thoroughly cleaned after completing the repackaging operation (refer to Appendix B).

#### IV. SPILL CONTINGENCY PLANNING

Contingency plans call for pre-planning the response to and cleanup of a spill that happens. Site specific pesticide spill contingency plans should be developed for all pest control shops and pesticide storage areas. This plan should be included in, or attached as an annex to, the facility's Pest Management Plan, Hazardous Waste Management Plan, Oil and Hazardous Substances Spill Contingency Plan, and Installation Spill Prevention Control and Countermeasure Plan. The plan should outline specific procedures to be followed when a pesticide spill occurs and clearly identify the roles and responsibilities of each individual involved in the overall response scheme. Such a plan will save valuable time and will effectively reduce human risk and environmental damage from an accidental spill. The plan should include the following information:

A. Notification list including emergency phone number for:

1. Designated base/installation spill coordinator or the contact designated in the base/installation spill contingency instruction.
2. Nearby offices and buildings requiring evacuation.
3. Base/installation fire and security departments.
4. Base bioenvironmental engineer (or equivalent, depending on the service)
5. EFD/NEPSS hazardous waste management contact (Navy only).
6. Nearest emergency medical unit
7. Local poison control center (800-424-9300) (See Reference 8).
8. CHEMTREC (800-424-9300) or National Agriculture Chemical Association (NACA) operator.
9. National Response Center at Coast Guard headquarters (800-442-8802). To be notified immediately by voice when spills occur in U.S. waters.
10. Local Emergency Planning Committee (LEPC) and State Emergency Response Commission (SERC).
11. DoD Pesticide Hotline (410-671-3773) DSN 584-3773 U.S. AEHA.

B. A complete inventory of all pesticides on hand, including EPA registration numbers and manufacturer's name and address.

C. A detailed, up-to-date sketch of the pesticide shop or storage area should be included. This sketch or map should show exterior runoff patterns, nearby water sources (wells, lakes, streams, etc.), water drainage patterns and times, volume capacity of holding basins, available gate valves in storm drainage system, storage location of specific pesticides, and location of spill kits and other emergency response equipment.

A copy of this plan should be given to the base/installation's spill coordinator and the fire department for use in responding to emergencies. Another copy of this plan should be maintained in a predetermined highly visible location within the shop or storage area. Spill kits should be included as part of a spill contingency plan. Being properly prepared for handling pesticide spill emergencies requires preparation of a

pesticide spill kit and understanding the steps to be followed when a spill occurs, The kit should contain an emergency spill procedures sheet and should be labeled and designated only for use in managing pesticide spills. Recommended materials for inclusion in the pesticide spill kit are listed in Appendix A. Most items can be obtained through the federal supply system or local manufacturers and suppliers.

The exact size and contents of each spill kit will vary with the amount and type of pesticides handled by the shop. Each pest control shop vehicle that transports pesticides also should have a small spill kit for cleaning up and decontaminating spills from service containers or 1-gallon sprayers. The exact contents of each spill kit should be tailored to the needs of the individual shop. The spill kit should be able to contain and clean-up the largest container or sprayer at the site.

## **V. SPILL EMERGENCY PROCEDURES**

When a pesticide spill occurs, specific procedures should be followed for providing first aid, notifying proper authorities, and cleaning up and decontaminating the spill area. Personnel working with pesticides or in areas containing pesticide chemicals should be adequately trained for quick evacuation and proper spill prevention and emergency procedures as follows:

### **A. Identification**

Determine the pesticide involved in the spill incident. Information such as formulation, percent active ingredient, and manufacturer's name and address should be obtained.

### **B. Safety and First Aid**

All persons working with pesticides should be well trained in basic first aid and evacuation procedures. It must be emphasized that when managing any spill the most immediate concern is for the health and well being of persons in and around the immediate spill area.

First aid kits and personal protective equipment should be maintained at pest control shops and storage areas and carried on pest control vehicles. In addition, the telephone numbers of the local medical unit and poison control center should be posted in visible locations and always carried by pest control personnel when on the job.

### **C. Care of Injured**

It is recognized that pesticide spill emergencies will differ, but the immediate concern

should be to minimize contamination of personnel. Although the sequence may vary, the following basic procedures should be accomplished as rapidly as possible. PRIOR TO ENTERING A CONTAMINATED AREA, DON PERSONAL PROTECTIVE EQUIPMENT (PPE).

1. Quickly assess the spill to determine if personnel are involved.
2. Eliminate all sources of ignition (e.g., pilot lights, electric motors, gasoline engines) in order to prevent the threat of fire or explosion from inflammable vapors (if present).
3. If personnel are involved, the rescuer should quickly don necessary protective equipment and remove the injured to a safe location upwind from the spill. If the spill occurs in an enclosed area, doors and windows should be opened to enhance ventilation of the area.
4. If necessary, remove contaminated clothing from the victim and/or rescuer, then wash affected areas of body with soap and water. Administer additional first aid as required by the symptoms/signs and label, which may include flushing contaminated eyes with clean water for 15 minutes.
5. Obtain medical assistance for injured or contaminated persons. **NOTE:** Do not leave injured or incapacitated persons alone. Always instruct someone to stay with them until proper medical assistance is provided or a physician has been informed of the incident.

#### **D. Site Security**

Secure the spill site from entry by unauthorized personnel by roping off the area and posting warning signs. The boundary should be set at a safe distance from the spill, If necessary, obtain assistance from the base/installation's police or security unit.

#### **E. Containment and Control**

Spilled pesticides must be contained at the original site of the spill. The pesticide must be prevented from entering storm drains, wells, water systems, ditches, and navigable waterways by following these procedures:

1. Don appropriate protective equipment from a spill kit or the pest control shop.
2. Prevent further leakage by repositioning the pesticide container.
3. Prevent the spill from spreading by trenching or encircling the area with a dike of sand, absorbent material, or, as a last resort, soil or rags.

4. Cover the spill. If the spill is liquid, use an absorbent material appropriate to the type of material. If dry material, use a polyethylene or plastic tarpaulin and secure. **NOTE:** Use absorbent materials sparingly as they also must be disposed of as wastes.

## **F. Pesticide Spill Reporting**

Not all pesticide spills warrant reporting to EPA or the Coast Guard. However, spills that involve pesticides equal to or exceeding the designated reportable quantity (RQ) specified in EPA's Clean Water Act list of hazardous substances and the Comprehensive Environmental Response, Compensation, and Liability Act list of hazardous substances (see Appendix C for RQs of major pesticides) must be reported. All pesticide spills should be reported in accordance with each service's regulations (Air Force, AFR 19-8; Navy OPNAV Notice **5090.1A**, Environmental Protection; Army, AR 200-1 ; Marine Corps, **MCO P5090.2**), and the base/installation's spill contingency instruction. Pesticide spills should be reported to the spill coordinator designated in the base/installation's spill contingency instruction. The coordinator in turn will report the spill to EPA or the Coast Guard, as required.

The individuals or agencies in **IV.A.** should be notified, as appropriate, when spills occur. These contacts also can provide information on how to cope with problems that may be encountered in handling pesticide spills. The telephone numbers of contacts should be posted as part of the Pest Control Shop or base/installation's emergency plan.

## **G. Cleanup**

Adequate cleanup of spilled pesticides is essential in order to remove any health or environmental hazards. When cleaning up pesticide spills, it is advisable **NOT TO WORK ALONE** and to make sure the area is properly ventilated and that appropriate protective equipment is used by all personnel. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses. However, if the release is not an incidental release, only qualified, trained emergency personnel should undertake cleanup operations. Minimum initial training and refresher training requirements are specified in the Occupational Safety and health Standards of 29 CFR 1910.120.

1. Dry spills (dusts, wettable powders, granular formulations) should be picked up in the following manner:

(a) Immediately cover powders, dusts, or granular materials to prevent them from becoming airborne. This can be done by placing a polyethylene or plastic tarpaulin

over the spilled material. Weight the ends of the tarp, especially the end facing into the wind. Begin cleanup operations by systematically rolling up the tarp while simultaneously sweeping up the spilled pesticide using a broom, shovel, or dust pan. While sweeping, avoid brisk movements in order to keep the dry pesticide from becoming airborne. If indoors, a cover may not be necessary. When practical, light sprinkling with water may be used instead of a cover.

(b) Collect the pesticide and place in plastic or metal containers. Heavy-duty plastic bags should be used as a last resort as many pesticides may eat through the plastic bags. Property secure and label the bags, identifying the pesticide and possible hazards. Set the bags aside for later disposal.

2. Liquid spills should be cleaned up by placing an appropriate absorbent material (floor-sweeping compound, sawdust, sand, etc.) over the spilled pesticide. Work the absorbent into the spill using a broom or other tool to force the absorbent into close contact with the spilled pesticide. Collect all spent absorbent material and place into a properly labeled leakproof container.

3. Depending upon the spilled substance, contaminated soil may have to be removed to depths where no detectable amounts of the substance are evident. Residues may need to be placed in properly labeled leakproof containers. For this determination, contact the base/installation environmental engineer/coordinator.

#### H. Decontamination

Decontamination solutions can be used for decontaminating surfaces and materials where spills of dust, granular, wettable powder, or liquid pesticides have occurred. However, the bulk of the spilled pesticide should be cleaned up or removed before applying any decontaminant. After cleaning up the bulk material, apply the appropriate decontamination solution and allow one to six hours reaction time before using an absorbent material.

Depending on the location of the spill and the pesticide spilled, chlorine bleach, caustic soda (lye, sodium hydroxide) or lime can be used to effectively decontaminate most spill areas. Many pesticides, especially the organophosphate pesticides, decompose when treated with lye or lime. Fewer pesticides are decomposed by bleach (sodium hypochlorite) (Appendix B).

Dry decontaminants should be spread thinly and evenly over the spill area. Then, using a watering can, lightly sprinkle the area with water to activate the decontaminant. Liquid decontaminants should be premixed and applied with a watering can to the spill area. Decontaminants should be applied in amounts no greater than specified in Appendix B.

The preceding procedures must be repeated until all the spilled pesticide is removed. Clean all equipment used for spill cleanup with detergent and appropriate decontaminants. Collect all spent decontaminants and rinse water and place them in labeled leakproof containers. Clothing and gloves that cannot be decontaminated must be placed in leakproof containers for proper disposal. Depending on the particular surface, the following additional procedures may need to be accomplished as specified.

1. Nonporous surfaces should be washed with detergent and water. The appropriate decontamination solution should be thoroughly worked into the surface using a long-handled broom, scrub brush, or other equipment as needed. Then the decontamination solution is soaked up using absorbent material. The spent absorbent material is then placed into a labeled leakproof container for disposal.

2. Soil. If pesticide containers have leaked or if pesticides have been spilled on a soil surface, depending upon the spilled substance, contaminated soil may have to be removed to depths where no detectable amounts of the substance are evident. Residues may need to be placed in properly labeled leakproof containers.

3. Porous materials such as wood may not be adequately decontaminated. If contamination is great enough to warrant, they must be removed and replaced with comparable new materials.

4. Tools, vehicles, equipment and any contaminated metal or other nonporous objects can be readily decontaminated using detergent and the appropriate decontamination solution (refer to Appendix B). However, smaller quantities of the decontamination solution may be required.

The decontamination solution can be applied to contaminated equipment by soaking the equipment in a pail filled with solution or using a scrub brush. All tools and surfaces must be thoroughly rinsed with sparing amounts of clean water. All rinse water and spent decontamination solution should be collected in drip pans or other suitable containers and transferred to a properly labeled leakproof drum for disposal.

## **I. Disposal**

All contaminated materials, including cloth, soil, wood, etc., that cannot be effectively decontaminated as described in this guide must be removed and placed in a sealed leakproof container. All containers must be properly labeled and transported in accordance with Department of Transportation (DOT) regulations by EPA-permitted hazardous waste haulers for disposal in a hazardous waste disposal facility (incinerator, landfill site, etc.) under current EPA or state permit. Information about specific disposal sites, container labeling, rinsing, and disposal is contained in the

NEPSS Hazardous Waste Disposal Guide (Reference 4). Additional disposal information for stock pesticide formulations can be found in the Consolidated Hazardous Items List (CHIL) (Reference 6). Coordinate with the base/installation Environmental Coordinator on disposal procedures.

## **VI. POST-SPILL PROCEDURES**

After the spill has been decontaminated, the following actions should be taken to ensure that decontamination has been adequate:

### **A. Sample Collection and Analysis**

Representative samples of affected environmental areas (soil, water, sediment, etc.) should be collected and analyzed for pesticide content to ensure that decontamination was effective. Pesticide residue sampling procedures are contained in Reference 5.

### **B. Investigation of Cause**

An investigation into the cause of the spill and any contributing events should be undertaken in order to ascertain why the spill occurred. This information will be of benefit in making future spill prevention recommendations. In addition, the spill episode should be well documented for future reference.

### **C. Disposal**

Disposal of contaminated materials should be accomplished. Guidance on disposal can be obtained from those agencies listed in paragraph VII.

## **VII. INFORMATION AND ASSISTANCE**

Comprehensive information about pesticide spill, prevention, cleanup and decontamination can be obtained from the respective Naval Facilities Engineering Command Engineering Field Division (EFD) Applied Biologist; USAF Armstrong Laboratory, Brooks AFB, TX; or Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD. If these sources are unable to provide the necessary information about a spill, the following additional sources are available:

A. National Agricultural Chemical Association Pesticides Safety Team Network (PSTN) (800) 424-9300. The function of the PSTN is to provide advice and on-site assistance when spill situations warrant. This network operates through the Chemical Transportation Emergency Center (CHEMTREC). CHEMTREC contacts the pesticide manufacturers who provide specific information regarding the handling

of pesticide spills. If needed, a spill response team can be requested to assist in spill cleanup operations.

B. EPA Oil and Hazardous Material Technical Assistance Data System (OHM-TADS). OHM-TADS is a computerized information retrieval system that can provide information about more than 2,000 hazardous substances, including pesticide chemicals. This system can be accessed through the respective NAVFAC EFD Environmental Branch Offices or by contacting NESO Code 2512. OHM-TADS also can be accessed through the regional EPA oil and hazardous material spill coordinators.

C. U.S. Coast Guard Chemical Hazard Response information System (CHRIS) (800) 424-8802. The Coast Guard can provide guidance about methods for handling spills. Assistance can be obtained by contacting local Coast Guard stations or the Coast Guard district office or National Spill Response Team.

## VIII. REFERENCES

1. Designation of Hazardous Substances, 40 CFR 116.
2. Determination of Reportable Quantities for Hazardous Substances, 40 CFR 117 and 40 CFR 302.
3. Spill and Hazardous Substances Pollution Contingency Plan, 40 CFR 1510
4. NEPSS Hazardous Waste Disposal Guide, NESO 20.2-011.
5. NEPSS Pesticide Residue Sampling Guide, NESO 20.2-012.
6. Consolidated Hazardous Item List (CHIL), NAVSUP Publication 4500, Cog 1, Stock No, 0588-00-005-000, April 1979.
7. Department of Transportation, US. Coast Guard Chemical Hazard Response System, 1974, CG-446. Volumes I-4.
8. Directory of Poison Control Centers, US. Department of Health, Education and Welfare, Division of Hazardous Substances and Poison Control, Washington, D.C., Stock Number 1712-0129.
9. Safety Guides for Handling and Warehousing Class B Poisons (Pesticides), National Agricultural Chemicals Association, 1155 15th Street, NW, Washington, D.C. 20005.

10. Department of Transportation Hazardous Materials Transportation Regulations  
49 CFR 171-192.

11. Managing Pesticide Spills, 1976 Technical Release, ESPC 071 101, National  
Pest Control Association, 8150 Leesburg Pike, Vienna, Virginia 22180. (800)  
678-NPCA.

12. Decontaminating Accidental Spills of Pesticides, National Agricultural Chemicals,  
October 1969, pp 8-9.

13. Guidelines for the Disposal of Small Quantities of Unused Pesticides,  
EPA-670/2-75-057, June 1978. US Environmental Protection Agency, Cincinnati,  
Ohio 45268.

14. Navy Hazardous Materials Management Guide, NESO 20.2-024A.

15. NIOSH/OSHA Pocket Guide to Chemical Hazards.

**APPENDIX A**

**SPILL KIT CONTENTS**

## SPILL KIT CONTENTS

Proper handling of pesticide spills requires prior preparation of a spill kit containing directions for use if a spill incident should occur. The kits should be labeled and designated for use in handling pesticide spills only, and should be strategically placed where spills are most likely to occur. The label should list the contents, and the kit should be sealed to discourage pilferage.

Spill kits may be assembled by procuring items through the Federal Supply System, or from commercial sources. Additional suppliers may be obtained by contacting the EFD Applied Biologist or Command Entomologist.

The following is a list of equipment required for shop and vehicle spill kits:

### Shop kit

- 1 55-gallon open-head drum
- 1 set of instructions
- 4 pairs neoprene gloves
- 2 pair of unvented goggles
- 2 respirators and pesticide cartridges
- 2 aprons (chemical resistant)
- 2 pairs of rubber boots
- 2 pairs of 100% cotton coveralls
- 1 dustpan
- 1 shop brush
- 1 square-point "D" handle shovel
- 1 dozen polyethylene bags w/ties (heavy ply)
- 1 18" pushbroom, synthetic fibers
- 1 gallon liquid detergent
- 3 gallons household bleach
- 80 lbs absorbent material
- 1 bung wrench
- 1 drum spigot
- 1 1-3/8" open-end wrench
- 1 drum pump (manual)
- 30 ft 1/2" polyethylene tubing or 1 25-ft garden hose
- 1 bung 2 1/2"
- 1 bung 3/4"
- blank labels
- 1 lint aid kit

### Vehicle kit

- 1 instruction sheet
- 1 5-gallon open-head drum
- 2 pairs of neoprene gloves
- 1 pair of unvented goggles
- 1 respirator and cartridges
- 1 pair of coveralls
- 1 dustpan
- 1 shop brush
- 10-30 lbs absorbent material
- 1 pint liquid detergent
- 6 polyethylene bags w/ties (heavy ply)
- 1 portable eyewash
- blank labels
- 1 first aid kit
- 1 pr rubber boots
- 1 apron

Most equipment and materials needed for spill emergency response and for maintaining spill kits can be obtained through the GSA Federal Supply System or local manufacturing companies.

**APPENDIX B**  
**PESTICIDE DECONTAMINANTS**

## PESTICIDE DECONTAMINANTS

Depending on the particular pesticide, chlorine bleach, caustic soda (lye, sodium hydroxide) or lime can be used to decontaminate most spills. For other decontamination/degradation options, refer to Reference 12. Many pesticides, especially the organophosphate pesticides, decompose when treated with lye or lime. Fewer pesticides are decomposed by bleach (sodium hypochlorite). **Other** pesticides cannot be effectively decontaminated and should only be treated with detergent and water to help in removal. Some examples of common pesticides that can be decontaminated are listed below:

Use Lye  
or Lime for:

**Atrazine**  
Propoxur  
**Captan**  
**Carbaryl**  
**Diazinon**  
Temephos  
**Naled**  
2.4.5-T  
Malathion  
**Accephate**  
Sodium Fluoride  
TCA  
**Rotenone**  
**Silvex**  
**Cyanazine**  
Dalapon  
**Dichlorvos**  
Dimethoate  
EPN

Use Chlorine  
Bleach :

Calcium cyanamide  
Calcium Cyanide  
**Chlorpyrifos**  
Fonophos  
**Merphos**  
**Lethane**

Do not use any decontamination  
Chemicals for these pesticides:

**Alachlor**  
Chloramben  
Chlordane and other  
Chlorinated hydrocarbons  
**Diuron**  
2.4-D  
Maneb  
**Methoxychlor**  
Pentachlorophenol  
Picloram  
Toxaphene  
**Trifluralin**

---

### USE

A practical guide for applying decontaminants is as follows:

<u>Percent Active Ingredient</u>	<u>Amount of Decontaminant needed</u>
I-10	Use an amount of decontaminant equal to the quantity of pesticide spilled.
11-79	Use an amount of decontaminant equal to 1.5 times the quantity of <b>pesticide spilled</b> .
<b>80-100</b>	The amount of decontaminant used should be equal to twice the quantity of spilled <b>pesticide</b> .

WARNING: There is a slight potential for creating toxic by products when using these procedures. In critical situations, samples of affected components (soil, sediment, water, etc.) should be taken and sent to a laboratory for analysis in order to determine if **decontamination** was successful.

## Lye or Lime

Pesticides amenable to treatment using lye or lime may be decontaminated when mixed with an excess quantity of either of these materials. These materials can be used in either the dry form or in solution. A 10% solution of lye or lime can be made as follows:

Mixing directions: Mix 0.75 pounds of lye or lime in 3.5 quarts of water to make 1 gallon of 10% solution.

Caution: Caustic soda (lye) can cause severe eye damage to persons not properly protected. Protect against contact by wearing unventilated goggles, long-sleeved work clothes with coveralls, neoprene gloves, and chemical-resistant apron. An approved respirator also should be worn. Do not use lye on aluminum surfaces.

Bleach Treatment. Certain pesticides can be degraded by treatment with bleach (sodium hypochlorite). Generally, one gallon of household bleach, which contains approximately 5 percent sodium hypochlorite, should be used per pound or gallon of pesticide spilled. If bleaching powder is used, first mix it with water (one gallon of water per pound of bleach) and add a small amount of liquid detergent. For safety purposes, a preliminary test must be run using small amounts of bleach and the spilled pesticide. The reaction resulting from this test must be observed to make sure reaction is not too vigorous. Do not store near to, or mix chlorine bleach with, amine-containing pesticides. Co-mingling of these materials can cause a violent reaction resulting in fire. Calcium hypochlorite is not recommended as a decontaminating agent because of the fire hazard.

APPENDIX C  
REPORTABLE QUANTITIES  
FOR MAJOR PESTICIDES

The following list is the reportable quantity (RQ) for many pesticides. Spills of pesticides that may enter waterways in quantities **equal** to or exceeding the RQ must be reported to the base/installation spill coordinator, the Coast Guard at (800) 442-8802, or to the appropriate EPA regional representative.

**Spills** involving mixtures of pesticides appearing on the list require reporting **only** when one or more of the materials in the mixture spilled **equals** or exceeds the RQ indicated for the **specific** pesticide **and** enters or threatens navigable water as defined in 40 CFR 117. The percentage of active ingredients in the specific pesticide product spilled and specific gravities of these materials, including carriers and/or diluents, should be used for determining **RQs** for each component. Refer to the complete EPA list of hazardous substances (Reference 1) for **RQs for additional** substances. Specific examples of calculations for determining reportable quantities are contained in this appendix.

The chart provided below can be used to convert percent active ingredients for emulsifiable concentrates to the approximate pounds of actual pesticide per gallon. This chart is provided for convenience and should be used only for purposes of providing **initial** estimates of spilled pesticide. It is not intended as a supplement to label information indicating pounds actual pesticide per gallon.

Conversion table for Active ingredients in  
Emulsifiable Concentrates (EC)

<u>percent Active Ingredient</u>	<u>lbs/gal</u>
10-12	1
15-20	1.5
25	2
40-50	4
60-65	6
70-75	8
80-100	10

List of Reportable Quantities (RQ) for Major Pesticides

Major pesticides including diluents and carriers appearing on the EPA list of hazardous substances have been extracted and are provided below. In general, a spill requires reporting to EPA or the Rational Response Center when the amount of active ingredient spilled equals or exceeds the RQ for the specific pesticide as indicated below. Users of the following table should be aware that the EPA lists of hazardous substances and RQs are subject to change.

The table also presents information on the Superfund Amendments and Reauthorization Act (SARA) Section 302 Extremely Hazardous Substances, the presence of any of which, in sufficient quantities, requires certain emergency planning activities to be conducted. The Threshold Planning Quantity (TPQ) for these substances is shown under the column "Section 302 TPQ." MS RQ or the reportable quantities of Extremely Hazardous Substances are subject to reporting under Section 304 of Title III. If a final RQ has not been assigned under CERCLA to a chemical listed under Section 302, a statutory RQ of 1 pound applies for Section 304 reporting. The EHS column lists the 1 pound statutory RQ for EHSs not listed under CERCLA. SARA Section 313 Toxic Chemicals, emissions or releases of which must be reported annually as part of SARA Title III's community right-to-know provisions. Inerts and pesticides subject to Section 313 are indicated with an "X."

Pesticide	SARA			CERCLA	
	Section 302 TPQ (lbs)	Section 304 EHS RQ (lbs)	Section 313	RCRA Waste Number	Pounds
Acetaldehyde				U001	1000
Acrolein	500		X	P003	100
Aldicarb	100/10,000			P070	1
Aldrin	500/10,000		X	P004	1
Amitrole				U011	10
Aluminum phosphide	500			P006	100
4-Aminopyridine				P008	1000
Aroclor 1016					1
Aroclor 1221					1
Aroclor 1232					1
Aroclor 1242					1
Aroclor 1248					1

Pesticide	SARA			CERCLA	
	Section 302 TPQ (lbs)	Section 304 EHS RQ (lbs)	Section 313	RCRA Waste Number	Pounds
Aroclor 1254					1
Azinphos-ethyl	100/10,000	1			
Azinphos-methyl	10/10,000				1
BHC - alpha					10
BHC - beta					1
BHC - delta					1
BHC - gamma	1000/10,000		X	U129	1
Bromadiolone	100/10,000	1			
Cacodylic acid				U136	1
Captan			X		10
Carbaryl			X		100
Carbofuran	10/10,000				10
Carbophenothion	500	1			
Carbon disulfide	10,000		X	P022	100
Chloramben			X		
Chlordane	1000		X	U036	1
Chlorfenvinfos	500	1			
Chlormephos	500	1			
Chlormequat chloride	100/10,000	1			
Chorobenzilate				U038	10
Chlorophacinone	100/10,000	1			
Chlorothalonil			X		
Chloroxuron	500/10,000	1			
Chlorpyrifos					1
Coumatetralyl	500/10,000	1			
Coumaphos					10
Crimidine	100/10,000	1			
Cyanophos	1000	1			
2,4-D Acid			X	U240	100
2,4-D salts and esters				U240	100

Pesticide	SARA			CERCLA	
	Section 302 TPQ (lbs)	Section 304 ENS RQ (lbs)	Section 313	RCRA Waste Number	Pounds
DDD				U060	1
DDE					1
DDT				U061	1
Demeton	500	1			
Demeton-S-methyl	500	1			
Diallate			X	U062	100
Diazinon					1
Dicamba					1000
Dichlobenil					100
Dichlone					1
Dichlorvos	1000		X		10
Dicofol					10
Dicrotophos	100	1			
Dieldrin				P037	1
Dimefox	500	1			
Dimethoate	500/10,000			P044	10
Dimetilan	500/10,000	1			
Dinoseb	100/10,000			P020	1000
Dinoterb	500/10,000	1			
Diphacinone	10/10,000	1			
Diquat					1000
Disulfoton	500			P039	1
Diuron					100
Endosulfan	10/10,000			P050	1
Endothall				P088	1000
Endrin	500/10,000			P051	1
Endrin aldehyde					1
EPN	100/10,000	1			
Ethion	100				10
Ethoprophos	1000	1			
Ethylene dibromide			X	U067	1

Pesticide	SARA			CERCLA	
	Section 302 TPQ (lbs)	Section 304 EHS RQ (lbs)	Section 313	RCRA Waste Number	Pounds
Ethylene oxide	1000		X		
Famphur				P097	1000
Fenamiphos	10/10,000	1			
Fenitrothion	500	1			
Fensulfothion	500	1			
Fluoroacetamide	100/10,000			P057	100
Fluometuron			X		
Fonofos	500	1			
Formothion	100	1			
Fuberidazole	100/10,000	1			
Guthion					1
Heptachlor			X	P059	1
Heptachlor epoxide					1
Isodrin				P060	1
Kelthane (dicofol)			X		10
Kepone				U142	1
Lindane	1000/10,000		X	U129	1
Malathion					100
Maleic hydrazide				U148	5000
Maneb			X	U114	
Mephosfolan	500	1			
Methidathion	500/10,000	1			
Methyl bromide	1000		X	U029	1000
Metolcarb	100/10,000	1			
Methomyl	500/10,000			P066	100
Methoxychlor				U247	1
Methyl parathion	500/10,000			P071	100
Mevinphos	500				10
Mexacarbate					1000
Monocrotophos	10/10,000	1			
Naled					10

Pesticide	SARA			CERCLA	
	Section 302 TPQ (lbs)	Section 304 EHS RQ (lbs)	Section 313	RCRA Waste Number	Pounds
Nicotine	100			P075	100
Norbormide	100/10,000	1			
Oxamyl	100/10,000	1			
Paraquat	10/10,000	1			
Parathion	100		X	P089	10
PCNB			X	U185	100
Pentachlorophenol				U242	10
Phorate	10			P094	10
Phosfolan	100/10,000	1			
Phosmet	10/10,000	1			
Phosphamidon	100	1			
Pronamide				U192	5000
Prothoate	100/10,000	1			
Pyrethrins					1
Silvex				U233	100
Sodium arsenate					1
Sodium arsenite					1
Sodium fluoroacetate	10/10,000			P058	10
Strychnine and salts	500			P108	10
Sulfotep	500			P108	10
2,4,5-T acid				U232	1000
2,4,5-T amines					1000
2,4,5-T esters					1000
2,4,5-T salts					1000
TDE				U060	1
Terbufos	100	1			
Tetraethyl pyrophosphate (TEPP)	100			P111	10
Thiram				U244	10

Pesticide	SARA			CERCLA	
	Section 302 TPQ (lbs)	Section 304 EHS RQ (lbs)	Section 313	RCRA Waste Number	Pounds
Triamiphos	500/10,000	1			
Trichloronate	500	1			
Trichlorfon			X		100
Warfarin concen- tration > 0.3%	500/10,000			P001	100
Warfarin concen- tration < 0.3%	500/10,000			U248	100
Warfarin, sodium	100/10,000	1			
Zinc phosphide concentration > 10%	500			P122	100
Zinc phosphide concentration < 10%	500			0249	100