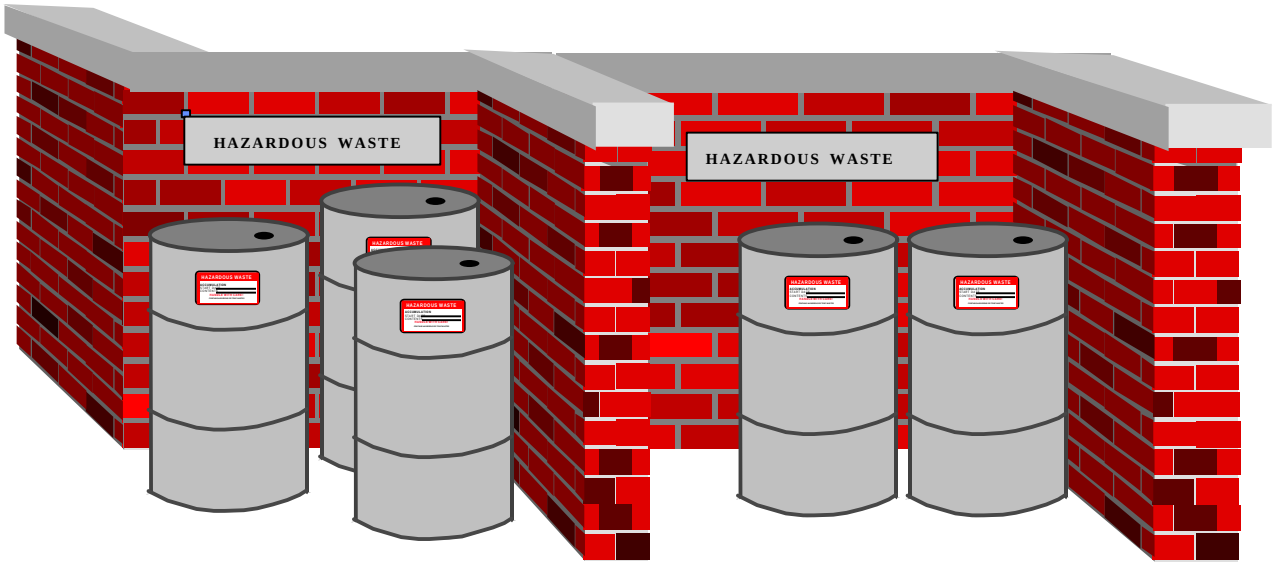
Best Management Practices

Handbook for
Hazardous Waste Containers



U.S. EPA Region 6, 1997

FOREWORD

This handbook was produced by A.T. Kearney, Inc., under contract to the Environmental Protection Agency (EPA) Region 6, for the Compliance Assurance and Enforcement Division of EPA Region 6. The idea to construct the handbook came from a RCRA workgroup composed of members of several oil and gas companies, the American Petroleum Institute (API), the Texas Mid Continent Oil and Gas Association (TMOGA), EPA, and environmental consulting firms. The RCRA workgroup is one of several workgroups making up the "Refinery Roundtable." The overall mission of the Refinery Roundtable is to develop methods by which petroleum refineries can achieve better compliance with the environmental regulations.

This handbook is to be used solely as guidance and cannot be relied upon to create any rights, substantive or procedural enforceable by any party in litigation with the United States. EPA reserves the right to act at variance with the policies and procedures herein, and to change them at any time without public notice.

Table of Contents

1. INTRODUCTION

Who will the Best Management Practices Handbook Help?

This handbook was written for anyone who, manages, or supervises the management of hazardous waste containers.

This handbook is a user-friendly training tool or reference that identifies and explains the regulations for managing hazardous waste containers safely in lay terms. The handbook also provides "Best Management Practices" (BMP) -- real world methods, examples, and tips for meeting and exceeding regulatory requirements. When workers understand what regulations mean and ***how*** to comply, environmental performance will improve.

Why did EPA develop the handbook?

The U.S. Environmental Protection Agency (EPA), Region 6, is working with the regulated community to ensure compliance with the regulations under the Resource Conservation and Recovery Act (RCRA). RCRA is the Federal government's regulatory program for managing hazardous wastes in order to protect human health and the environment.

EPA has found that the most common problem with generators of hazardous waste is the failure to meet the permit exemption requirements (for containers) as defined in 40 CFR 262.34(a)(1)(i). This regulation allows generators to temporarily store their hazardous wastes onsite, in containers, without a permit, provided that they meet certain container management requirements. A review of the findings from all the inspections conducted at petroleum refineries in Region 6 showed violations related to container management occur twice as often as any other type of RCRA violation.

§262.34(a)(1)(i) -- Except as provided in paragraphs (d), (e), and (f) of this section, a generator may accumulate hazardous waste on-site for 90 days or less without a permit or without having interim status, provided that:

(1) The waste is placed:
(i) In containers and the generator complies with subpart I, AA, BB and CC of 40 CFR Part 265.

Generators can store hazardous wastes in containers on-site for 90 days or less without a RCRA permit. The waste must be stored under certain conditions:

1) The waste must be stored in containers which meet the definition of a portable device (e.g., 55-gallon drums). Permanently-mounted tanks, surface impoundments, and waste piles **would not** be considered containers.
2) the waste must be stored according to the full set of regulatory requirements outlined in 40 CFR 265, Subpart I.

Requirements of 40 CFR 265, Subpart I will be discussed throughout this handbook.

How is the handbook organized?

The handbook is organized around the container management process -- from the time a waste is generated and placed in a container, to the time the waste-filled container is shipped off site for disposal.

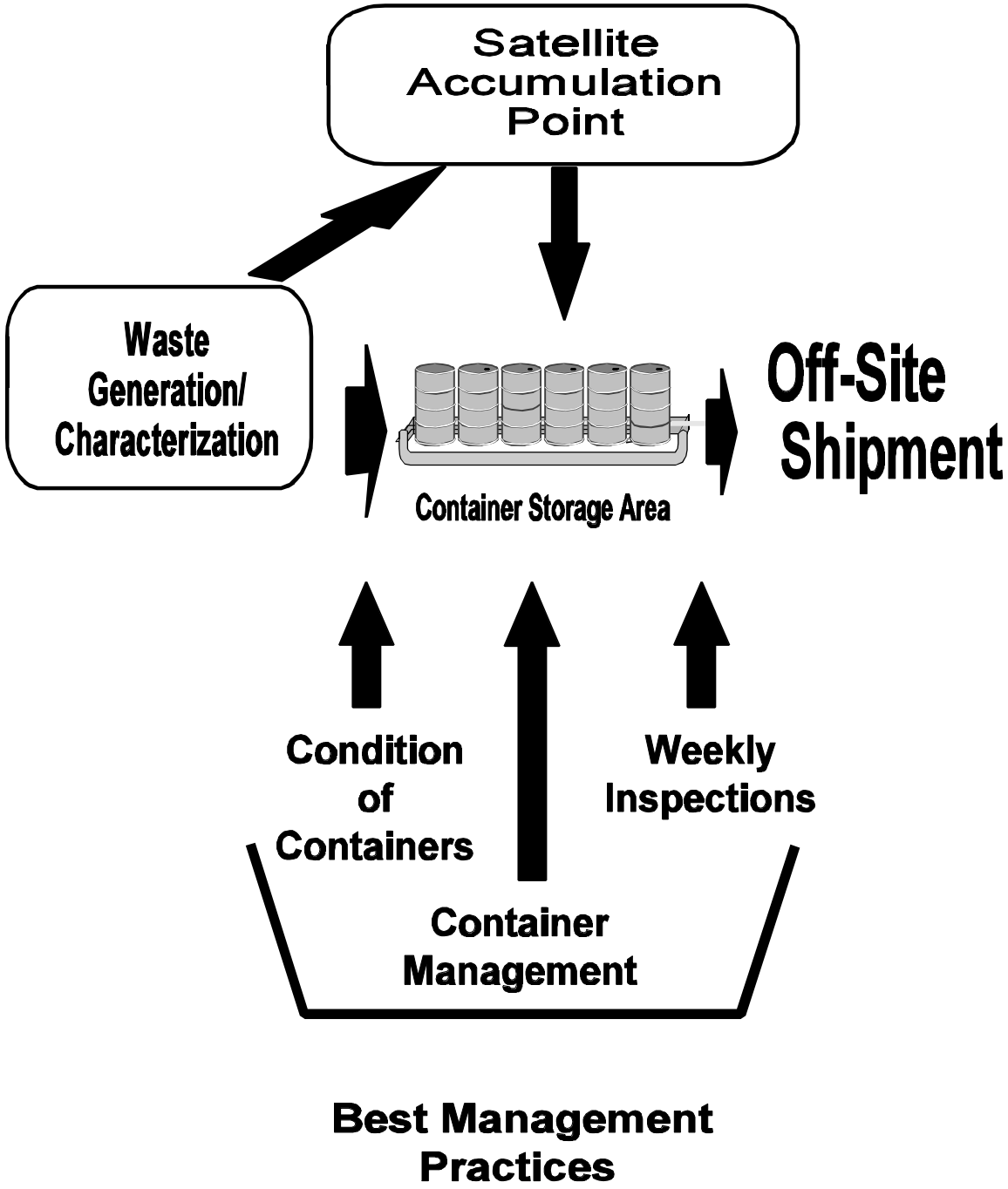
A flow diagram of the container management process is shown first, followed by a discussion of the process. The discussion explains real world container management requirements and operations and fits the regulations into those operations.

Management of containers in less than 90 day storage areas are also discussed in detail providing additional tips for compliance.

A listing of Federal and state contacts who can help you comply with the regulations is also provided.

Finally, two compliance tools are included at the back of the handbook. The first tool is a generic container inspection checklist (see page 16) that may be tailored for use at your facility. The second tool is a poster (see page 18) that uses simple, clear pictures to show best management practices for container management. You can tear the poster out of the handbook and display it for quick referencing at your facility.

CONTAINER MANAGEMENT PROCESS



2. BEST MANAGEMENT PRACTICES FOR CONTAINERS

The following sections will explain how to successfully manage hazardous wastes in containers. All relevant regulations are identified and explained. From these sections, you will...

A. Learn why waste characterization, or identifying and understanding your wastes, is important.
B. Learn how to select and label containers.
C. Learn methods to safely manage containers of hazardous waste.

A. WASTE CHARACTERIZATION

To safely manage hazardous waste, you must know exactly what a waste is, how it will act, and what its properties are. Is the waste extremely toxic? Do workers need special protection? Is the waste corrosive, will it corrode certain types of containers? Is the waste incompatible with other wastes -- will it react (explode, catch on fire) if it is mixed with another waste or water?

Once a waste is generated, it should be characterized, ***before*** you place the waste in a container. Waste characterization can be done by either:

1) sampling and analyzing the waste, or
2) identify the waste based on process knowledge (you know the constituents in the process and therefore you can use that knowledge to determine if the resulting waste has characteristics that could make the waste hazardous).

Best Management Practice

Tips ***for Waste Characterization***

1) Look at a material safety data sheet (MSDS) if it is available. Some information areas on the MSDS to look for are physical property, reactivity, fire and explosion hazard, and special protection information.
2) If a product being used in a process meets one or more hazardous characteristics, the waste generated may exhibit some of the same characteristics.

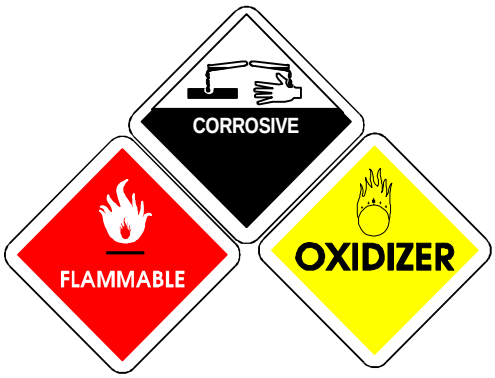
3) Be aware of any changes in a production process which could alter the composition of the waste generated.

Best Management Practice

***Tips* for Waste Characterization of Containerized Waste**

1) Pay attention to marking/labeling which may indicate that a material is flammable, corrosive, etc.
2) Always check with your supervisor before handling unknown drums, or drums which you feel are labeled or marked incorrectly.
3) Look at a material safety data sheet (MSDS) if it is available.
4) If waste is in a plastic drum it is a good indication the waste may be corrosive.

Special methods and equipment may be required to manage wastes which are:



1) Corrosive
2) Combustible
3) Flammable
4) Oxidizer
5) Poison
6) Toxic
7) Reactive

Putting Wastes in Containers - Reactive or Incompatible Wastes

Through waste characterization, you learn if a waste is reactive or incompatible with other wastes. Before putting wastes into a container it is necessary to identify and segregate wastes if they are incompatible and/or reactive. **This is important!! *Incompatible and/or reactive hazardous wastes must be stored in a manner to prevent fires or explosions*.**

§265.177 -- Special requirements for incompatible wastes

(a) Incompatible wastes, or incompatible wastes and materials (see appendix V for examples), must not be placed in the same container, unless 265.17 (b) is complied with.

The regulations state that incompatible wastes cannot be placed in the same container, unless you comply with other requirements found in §265.17 (b). This prevents the wastes from reacting with each other (e.g., exploding, catching on fire).

§265.17(b) ...the mixture or commingling of incompatible wastes, or incompatible wastes and materials, must be conducted so that it does not:
(1) Generate extreme heat or pressure, fire or explosion, or violent reaction;
(2) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health;
(3) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;
(4) Damage the structural integrity of the device or facility containing the waste; or
(5) Through other like means threaten human health or the environment.

The regulations allow you to put incompatible wastes in the same container, under the conditions found in §265.17(b) **(Warning: "*Always talk to your supervisor or environmental coordinator before mixing any materials or wastes*").** If you have to mix incompatible wastes in the same container you must make sure that the wastes won't react. This means that you must:

1) keep the waste from becoming too hot (*this will prevent fire or explosions*);
2) keep the wastes from producing toxic and/or flammable mists, gases, fumes, or dust (*this will prevent workers from being exposed to the waste and will prevent fire or explosions*);
3) make sure that mixing the incompatible wastes won't damage the container -- the container won't rupture or bulge; and
4) demonstrate that mixing the wastes won't threaten workers, or the environment in any way.

B. CONTAINER SELECTION

The best management practice for incompatible wastes is to store them separately. It is safer and easier to simply put incompatible wastes in separate containers and separate storage areas.

Once the waste has been characterized and you know if the wastes are incompatible or reactive, you then can select an appropriate container.

When selecting a container consider the amount of waste and type (characteristic) of waste.

First, you should consider the amount of waste you have -- it makes more sense to put 20 to 25 gallons of waste into a 30-gallon drum rather than a 55-gallon drum. On the other hand, a 55-gallon drum is better for storing contaminated gloves/coveralls.

§265.172 Compatibility of Waste with Container

The owner or operator must use a container made of or lined with materials which will not react with, and are otherwise compatible with, the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired.

Best Management Practice

When selecting the container you must make sure that a waste won't react with the ***container*** itself. For example, highly corrosive wastes will react with a steel drum -- the drum may fail and waste may be released. How can you safely store corrosive wastes? Use plastic, or plastic-lined, steel drums to safely store corrosive wastes. To prevent drum failure, carefully "**match" the right waste with the right container**.

Tip for Container Selection

Consult a corrosion resistance guide to determine if the container and waste are compatible.

Match the waste with the correct type of container.

§265.177 Special requirements for incompatible wastes

(b) Hazardous waste must not be placed in an unwashed container that previously held an incompatible waste or material (see appendix V for example), unless 265.177 (b) is complied with.

There's one more thing to think about when selecting a container. You can put wastes into unwashed containers that have held incompatible wastes, under regulation §265.177(b). **But**, you must make sure that you meet the conditions specified in §265.17 (b) (See page 6).

If a container has been used to store waste or other materials, you are required to make sure that:

1) the waste/material previously held in the container is compatible with the waste you are going to put in the container.

Best Management Practice

TIPS for Safely Putting Wastes in Containers

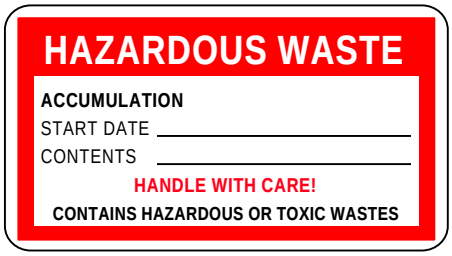
1) Make sure you know which wastes are reactive and/or incompatible. Keep these wastes away from each other. Put them in separate containers.
2) Make sure the container cannot be harmed by the waste.
3) If you rinse out containers onsite, be aware that rinse water generated from drum washing must be contained and characterized prior to disposal.
4) If you frequently reuse containers, consider "assigning" wastes to certain containers. This will allow you to reuse the container without washing.
5) Use a funnel to prevent spills, and do not use the same funnel for all wastes.
6) Certain chemicals may need room for expansion, or they may require zero headspace depending on the characteristics of the waste and storage conditions (e.g., temperature fluctuations)

Marking & Labeling Containers

Hazardous waste generators can only accumulate or store waste on-site for less than 90 days without a permit. The 90-day limit starts the moment the container is full. If your facility is a small quantity generator shipping wastes over 200 miles you can store wastes up to 270 days. If less than 200 miles, you can store waste up to 180 days.

§262.34(a)(2) The date upon which each period of accumulation began is clearly marked and visible for inspection on each container.

§262.34(a)(3) While being accumulated on-site, each container and tank is labeled or marked clearly with the words, "Hazardous Waste"...



Best Management Practice

You must be able to prove to inspectors that you have not exceeded the time limit for accumulation.

The regulations require that you clearly mark on the container the date hazardous waste completely filled the container. In addition, you must clearly mark all containers holding hazardous waste with the words "HAZARDOUS WASTE".

Besides the required markings, you will have to comply with all Department of Transportation (DOT) labeling requirements on the container before the waste can be shipped off site. The DOT label exactly identifies the waste, including name, characteristics, and handling requirements.

(More specific information on DOT labeling can be found in 49 CFR Part 172)

***Tips* for Marking/Labeling Containers**

1) Have all personnel use the same method (e.g., handwritten, prepared labels) to label containers. Make sure all handlers know what the markings mean.
2) Besides the start date and the words "Hazardous Waste," include information about contents (e.g., toxic, reactive, incompatible).
3) Apply DOT labels to the container when waste is first placed in the container. The label will be in place for shipment and provides information about the waste to drum handlers.
4) Before reusing containers, make sure all old markings/labels are washed off or blacked out.

Satellite Accumulation Points

It is important to mention satellite accumulation points (SAP) before discussing the requirements for managing hazardous waste at less than 90-day areas.

262.34(c)(1) A generator may accumulate as much as 55 gallons of hazardous waste or one quart of acutely hazardous waste listed in 261.33(e) in containers at or near any point of generation where wastes initially accumulate, which is under the control of the operator of the process generating the waste, without a permit or interim status and without complying with paragraph (a) of this section provided he:

(i) Complies with 265.171, 265.172, and 265.173(a) of this chapter; and
(ii) Marks his containers either with the words "Hazardous Waste" or with other words that identify the contents of the containers.
(2) A generator who accumulates either hazardous waste or acutely hazardous waste listed in 261.33(e) in excess of the amounts listed in paragraph (c)(1) of this section at or near any point of generation must, with respect to that amount of excess waste, comply within three days with paragraph (a) of this section or other applicable provisions of this chapter. During the three day period the generator must continue to comply with paragraphs (c)(1)(i) through (ii) of this section. The generator must mark the container holding the excess accumulation of hazardous waste with the date the excess amount began accumulating.

You can store up to 55 gallons of hazardous waste (or up to 1 quart of acutely hazardous waste) at a SAP for an unlimited amount of time and following only some of the requirements for 90-day areas. To store waste at a SAP you must simply:

1) keep the containers in good condition;
2) make sure the waste is compatible with the container; and
3) keep containers closed when not adding or removing waste. Make sure you handle the containers to prevent leaks or spills.
4) Mark container with words "Hazardous Waste" or words which identify the contents.

Because of fewer requirements, facilities like to designate storage areas as SAPs. This can be a problem. The definition of a SAP is specific. SAPs can **only** be located at or near the point of waste generation (where the waste is generated) ***AND*** the SAP has to be under the control of the person generating the waste. To be a SAP a storage area must:

1) only accumulate waste generated at the SAP -- SAPs can't be used as temporary staging areas for wastes collected from other areas; and
2) be located as near the point of generation as safety allows. For example, lab wastes may be accumulated in safety cans in the lab.

If you accumulate in **excess** of 55 gallons of hazardous waste or one quart of acutely hazardous waste at a SAP you must:

1) mark the container holding the excess accumulation of hazardous waste with the date the excess amount began accumulating.
2) move the container holding the excess accumulation to a container storage area within 3 days.

If your company incorrectly manages a 90-day storage area as a SAP, your company will be in violation of the regulations.

C. MANAGING CONTAINERS AT 90-DAY AREAS

The moment that waste is placed in the container, containers holding hazardous waste must be managed to prevent spills of hazardous waste.

Keeping Containers in Good Condition

§265.171 Condition of containers

If a container holding hazardous waste is not in good condition, or if it begins to leak, the owner or operator must transfer the hazardous waste from this container to a container that is in good condition, or manage the waste in some other way that complies with the requirements of this part.

One of the easiest ways to prevent spills is to make sure that containers are kept in good condition -- both before the waste is put in the container and while you are managing the container. What does good condition mean?

1) Containers must be free of dents and corrosion -- these weaken the container.
2) Containers must not leak -- the container must be structurally sound.
3) Containers must not bulge.

If you find any of these problems, you must transfer the waste from the "problem" container to a sound container.

Managing Filled Containers

§265.173 Management of containers

(a) A container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste.

(b) A container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.

How can you keep containers in good condition? Your company should have written procedures for managing containers. All employees should be trained in these procedures. At a minimum, you must:

1) keep containers closed at all times, except when you are adding or removing waste from the container;
2) be careful when you are handling the containers. You must open, handle, and store containers to prevent ruptures or leaks. For example, use drum grapplers to lift and move drums -- don't hand-roll the drums from one area to another; and
3) if the container begins to leak, or you notice dents or bulges, transfer the waste to another container.

You must also prevent reactions of ignitable and/or incompatible wastes. EPA developed three special management requirements for these wastes:

1) incompatible wastes must be physically separated
2) store ignitible and/or reactive wastes at least 50 feet from your property line
3) manage ignitable and/or reactive wastes to prevent fire and/or explosions.

Managing Incompatible, Ignitable and/or Reactive Wastes

§265.177 A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

Physically separate containers holding incompatible wastes from other wastes or materials. Store the containers in an area surrounded by a berm, dike, wall, or other physical structure.

Keep incompatible wastes from contacting/reacting with other wastes and materials.

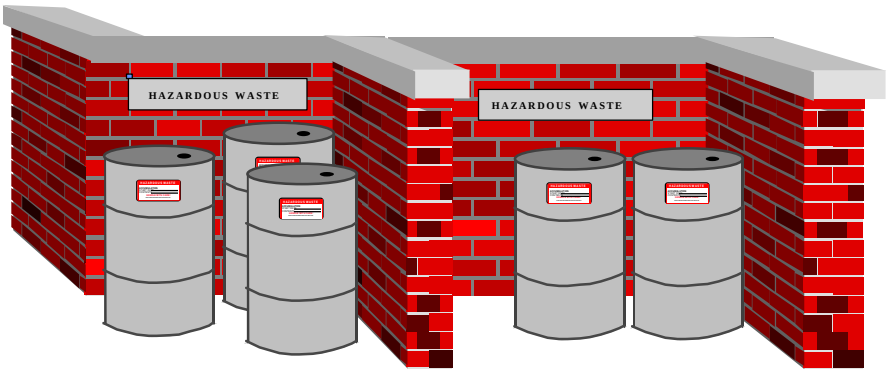
§265.176 Special requirements for ignitible or reactive waste

Containers holding ignitable or reactive waste must be located at least 15 meters (50 feet) from the facility's property line.

Store ignitible and/or reactive wastes at least 50 feet from the property line of your facility. Many facilities stack drums along fence lines for storage space -- this may be a convenient storage area that maximizes use of facility space, **however**, ignitable and/or reactive wastes **CANNOT** be stored this way. Locating these wastes well within the property boundaries provides two safeguards:

1) reduces the risk of the general public reaching/contacting the waste or being harmed in an explosion; and
2) if a release of hazardous waste does occur, this will help prevent the waste from migrating offsite.

Keep incompatible wastes from contacting/reacting with other wastes and materials



§265.17(a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste. This waste must be separated and protected from sources of ignition or reaction including but not limited to: Open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. While ignitible or reactive waste is being handled, the owner or operator must confine smoking and open flame to specially designated locations. "No Smoking" signs must be conspicuously placed wherever there is a hazard from ignitable or reactive waste.

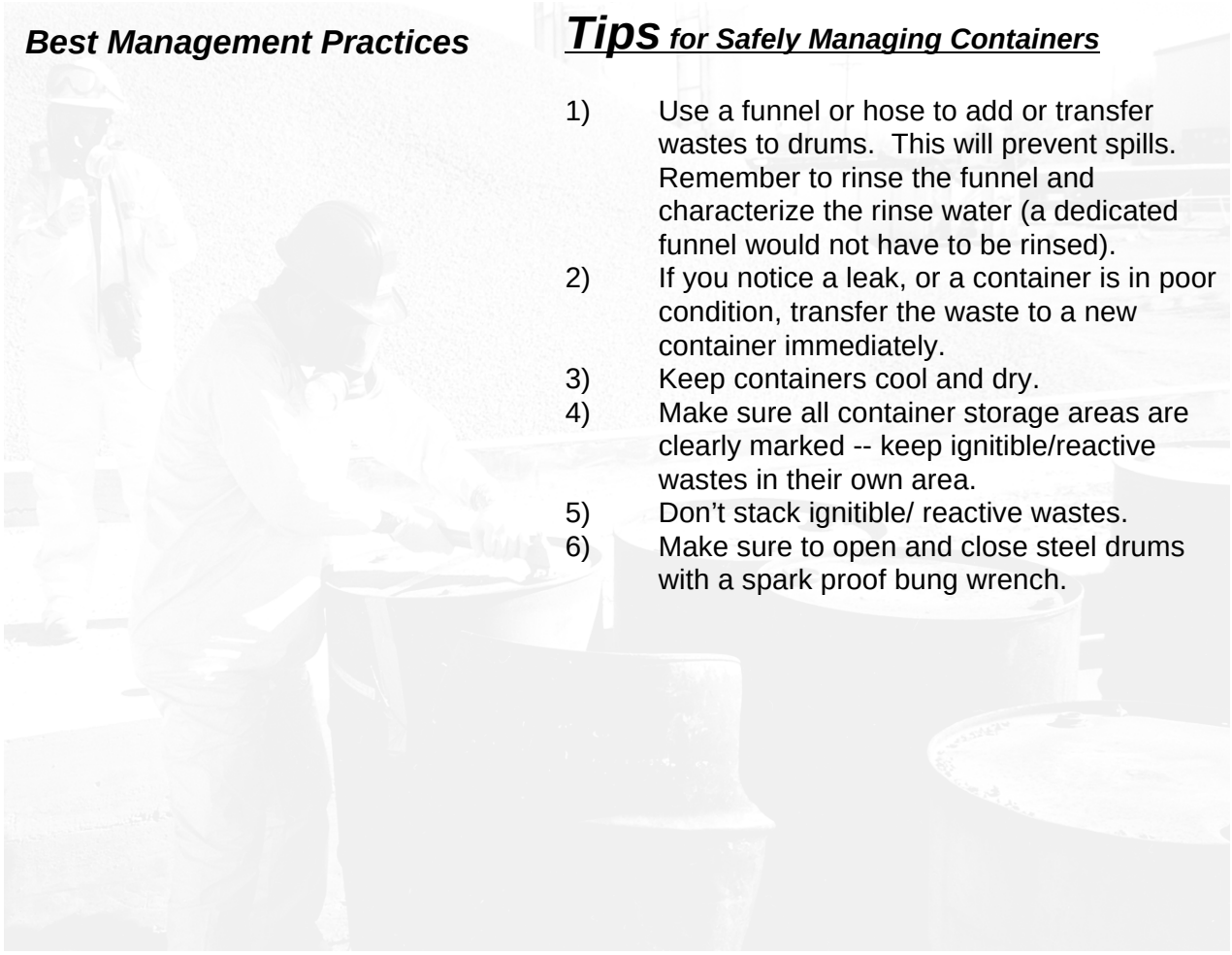
Manage ignitable and/or reactive wastes to prevent fire and/or explosions. At a minimum you must keep ignitable and/or reactive wastes away from:

1) fire;
2) hot surfaces like operating machinery, engines;
3) radiant heat or sunlight;
4) cutting and welding operations;
5) frictional heat -- keep drums stationary, don't pull drums along on the ground;
6) sparks from static electricity, electrical operations, or friction; and
7) some reactive wastes must be kept away from water.

Finally, you must ban smoking in all areas that manage ignitible or reactive wastes, especially when wastes are being transferred/placed into containers.

"NO SMOKING" signs must be posted at all areas near ignitible or reactive wastes.

Best Management Practices

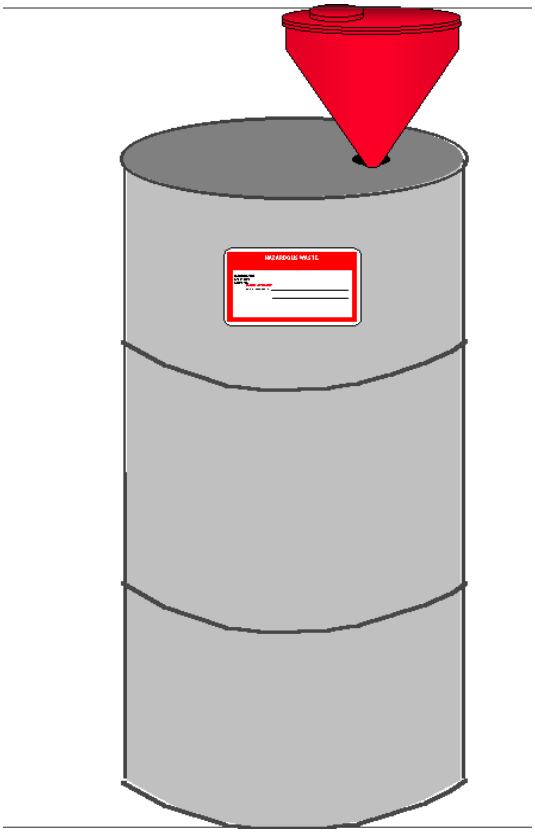


Tips for Safely Managing Containers

1) Use a funnel or hose to add or transfer wastes to drums. This will prevent spills. Remember to rinse the funnel and characterize the rinse water (a dedicated funnel would not have to be rinsed).
2) If you notice a leak, or a container is in poor condition, transfer the waste to a new container immediately.
3) Keep containers cool and dry.
4) Make sure all container storage areas are clearly marked -- keep ignitible/reactive wastes in their own area.
5) Don't stack ignitible/ reactive wastes.
6) Make sure to open and close steel drums with a spark proof bung wrench.

Tips continued

7) Don't push, roll, or drag containers. Use the right equipment to move the drums.
8) Make sure the drums are easy to reach -- keep an open aisle space so that people and equipment can move freely.
9) Don't drive equipment (trucks, forklifts) into container storage areas unless you are moving containers.
10) Keep the containers in a "containment area" to hold spills. Containment can be provided by dikes, berms, or walls.



Use a funnel to add or transfer wastes to drums. Remember when not in use to keep funnel covered or closed

3. INSPECTING CONTAINERS

§265.174 Inspections

The owner or operator must inspect areas where containers are stored, at least weekly, looking for leaks and for deterioration caused by corrosion or other factors.

Container storage areas must be **inspected weekly**. Inspections protect you, your company, and the public -- through inspections, you can stop spills ***before*** they happen.

Your company should develop and maintain a standard inspection checklist to be used during every weekly inspection. The checklist should be detailed and address the labeling and management procedures followed at your facility. An example of a checklist that can be modified to fit your facility is attached to the back of this booklet.

At a minimum, the inspection checklist should cover:

1) leaks or staining from containers;
2) container condition, including dents, bulging, and/or corrosion;
3) labeling -- start date, the words "Hazardous Waste" and other information; and
4) management practices -- such as aisle space, drum stacking.

Inspections should be detailed and methodical. Anyone doing inspections should be trained.

Best Management Practice

Tips for Conducting Inspections

1) Follow the inspection checklist -- make detailed notes if you find something wrong.
2) Be thorough. Check the tops of drums to look for waste residue or corrosion.
3) Walk all the way around containers -- check entire storage area.
4) Check containment area for stains.
5) Note anything unusual in containment area -- even if it might not be a problem.
6) If problems are found, get the problem taken care of immediately.
7) Keep a logbook of the facility's inspection checklist.

Summary

The Best Management Practices Handbook for Hazardous Waste Containers was published with the intent of helping to interpret the regulations pertaining to the handling and management of hazardous waste containers. The Handbook is not meant to act as a replacement for the regulations, but simply to give some practical examples of how to comply with them. Generators of hazardous waste should be aware that they must adhere to all the applicable regulations found in Title 40 of the Code of Federal Regulations.

The Handbook is structured so that it follows the typical path a hazardous waste might take from the time it is generated, until the container is ready to be sent offsite for disposal. The first, and most important task is for the generator to determine the composition and characteristics of the hazardous waste. The next step is to use that knowledge regarding the characteristics of the waste, to choose a container which will be compatible with the waste. After the waste is containerized, it should be marked or labeled appropriately, and moved into a container storage area. Once the container is transferred to a container storage area, it must be inspected weekly and kept in good condition until it leaves the site. Generators must consult the appropriate Department of Transportation regulations found in Title 49 of the Code of Federal Regulations prior to shipping hazardous waste containers offsite for disposal.

Page 18 contains a list of phone numbers for both the EPA Region 6 office, as well as the various state agencies located in Region 6. If you have any questions regarding the handling and management of hazardous waste containers, please contact your appropriate state agency, or the EPA Region 6 office.

4. HAZARDOUS WASTE CONTAINER STORAGE AREA INSPECTION CHECKLIST

Month: _____ Year: ____

Instructions: Weekly, place a "Yes" next to all inspection items that meet facility rules. Place a "No" next to all inspection items that do not meet the rules. Please provide specific comments on all "No-marked"items. When weekly inspection is completed, inspector **must** initial at the bottom of the table. Report all No-marked items to appropriate supervisor.

	Four-Week Inspection Period				**Comments on Inspection Items**
Inspection Item	**Date:** _____	**Date:** _____	**Date:** ____	**Date:** _____	
Number of Containers in Unit					
Containers Marked/Labeled Properly					
Containers Dated Properly					
Containers Stored 90 Days or Less					
Containers Observed to be free of Leaks/Staining					
Containers Observed with Closed Tops or Bungs					
Containers Observed without Dents or Corrosion					
Appropriate Aisle Space Maintained					
Containment System free of Water or Other Liquids					
Inspectors Initials					

Overall Comments:_____

_____

_____

_____

Reviewed by:_____ Date:_____

Note: State and Federal regulations require that this inspection be performed weekly.

5. FEDERAL AND STATE CONTACTS

1) **National Spill Response Center** - (800) 424-8802

2) **EPA Region 6 Emergency Response** - (214) 665-2770

3) **EPA Region 6**
1445 Ross Avenue
Dallas, Texas 75202
(214) 665-6444

4) **RCRA/Superfund Hotline**
Washington, DC
(800) 424-9346

5) **State Agency Numbers**:

Arkansas Department of Pollution Control & Ecology (ADPC&E) -
8001 National Drive
Little Rock, Arkansas 72209
(501) 682-0744

Louisiana Department of Environmental Quality (LDEQ) -
7290 Bluebonnet Road
Baton Rouge, Louisiana 70810
(504) 765-0647

New Mexico Environmental Department (NMED) -
1190 St. Francis Drive
Room North 4050
Santa Fe, New Mexico 87505
(505) 827-6055

Oklahoma Department of Environmental Quality (ODEQ) -
1000 NE 10th Street
Oklahoma City, Oklahoma 73117
(405) 271-7363

Texas Natural Resources Conservation Commission (TNRCC) -
Austin Regional Office
1921 Cedar Bend Dr.
Suite 150
Austin, Texas 78758
(512) 339-2929


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY