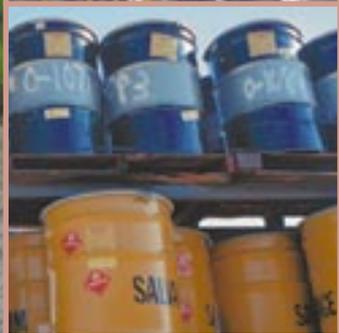
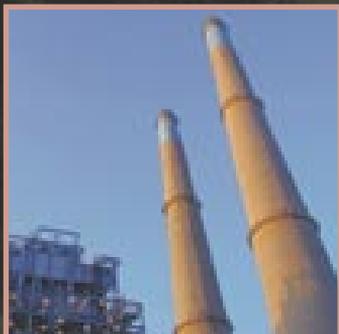




# RCRA: Reducing Risk From Waste



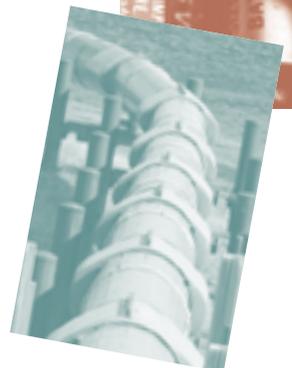
## Acronyms

These acronyms appear throughout the document. See the Glossary at the end of this document for full definitions.

CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
HHW	Household Hazardous Waste
LDR	Land Disposal Restrictions
LQG	Large Quantity Generator
MSW	Municipal Solid Waste
RCRA	Resource Conservation and Recovery Act
SQG	Small Quantity Generator
TRI	Toxics Release Inventory
TSDF	Treatment, Storage, and Disposal Facility
UST	Underground Storage Tank

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# What Is RCRA?

**A**s our society has changed over time, so have the amount and types of wastes we produce. Not only do households discard trash and garbage, but industrial and manufacturing processes create many different types of wastes as well. As technology has advanced, we have continually updated and improved our methods of waste treatment and management. Today, although many individuals, organizations, and businesses take steps to prevent or reduce the amount of waste they generate, it is inevitable that some materials still must be discarded. Environmental controls and sound management practices allow us to balance industrial growth with ecological and human health needs.

In 1965, to encourage environmentally sound methods for disposal of household, municipal, commercial, and industrial refuse, Congress passed the first federal law to require safeguards on these activities, the Solid Waste Disposal Act. Congress amended this law in 1976 by passing the Resource Conservation and Recovery Act (RCRA) (pronounced “Ric-ra”). The primary goals of RCRA are to:

- Protect human health and the environment from the potential hazards of waste disposal.
- Conserve energy and natural resources.
- Reduce the amount of waste generated.
- Ensure that wastes are managed in an environmentally sound manner.

As more information about the health and environmental impacts of waste disposal became available, Congress revised

RCRA in 1980 and in 1984. The 1984 amendments are referred to as the Hazardous and Solid Waste Amendments.

RCRA is divided into sections called Subtitles. Subtitles C and D set forth a framework for the U.S. Environmental Protection Agency's (EPA's) comprehensive waste management program:

- EPA's Subtitle C program establishes a regulatory framework for managing *hazardous waste* from generation until ultimate disposal.
- EPA's Subtitle D program establishes a system for managing *solid (primarily nonhazardous) waste*, such as household waste.

RCRA also regulates underground storage tanks (USTs) that store petroleum or certain chemical products under Subtitle I. Requirements exist for the design and operation of these tanks and the development of systems to prevent accidental spills. Examples of facilities using these tanks include petroleum refineries, chemical plants, and commercial gas stations.

The Medical Waste Tracking Act of 1988 was a 2-year demonstration program that expired in June 1991. It created a Subtitle J program designed to track *medical waste* from generation to disposal. At present, no federal EPA tracking regulations are in effect for medical waste, but many states have adopted their own programs.

The Comprehensive Environmental Response, Compensation, and Liability Act (known as Superfund or CERCLA) is a related statute that deals with cleaning up inactive and abandoned hazardous waste sites. RCRA, on the other hand, deals with materials that are currently destined for disposal or recycling.

The term "RCRA" is often used interchangeably to refer to the law, regulations, and EPA

## The Role of the States

In a given state, the hazardous waste regulatory program described in this document may be run by either EPA or a state hazardous waste agency. Both of these entities can be referred to as the "regulatory agency," depending on the state.

RCRA encourages states to assume primary responsibility for implementing the RCRA program, instead of EPA. States that want to adopt and implement the RCRA Subtitle C program must develop a program for the management of hazardous waste that is at least as stringent as the EPA program. State programs can be more stringent or broader in scope, however. This process ensures that minimum standards are met nationwide, while providing flexibility to states in implementing rules.

policy and guidance. The *law* describes the waste management program mandated by Congress that gave EPA authority to develop the RCRA program. EPA *regulations* carry out the Congressional intent by providing explicit, legally enforceable requirements for waste management. These regulations can be found in Title 40 of the *Code of Federal Regulations (CFR)*, Parts 238 through 282. EPA *guidance documents* and *policy directives* clarify issues related to the implementation of the regulations. These three elements are the primary parts of the RCRA program.

This booklet is intended to provide an overall perspective on how RCRA works, including the roles of EPA, states, tribes, the public, and the regulated community. It focuses primarily on Subtitle C and presents some information on Subtitle D as well. Additional information and publications can be obtained by calling the RCRA Hotline at 800 424-9346 or TDD (hearing impaired) 800 553-7672. From within the Washington, DC, area, call 703 412-9810 or TDD 703 412-3323.

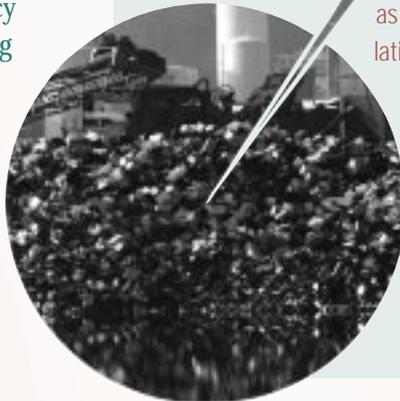


# Subtitle C: What Is a Hazardous Waste?

**H**azardous wastes come in many shapes and forms. They can be liquids, solids, contained gases, or sludges. They can be the byproducts of manufacturing processes or simply discarded commercial products, like cleaning fluids or pesticides. Whatever their form, proper management and disposal are essential to protect human health and the environment.

RCRA provides a general definition of the term “hazardous waste.” EPA has defined by regulation which specific materials are considered hazardous waste under Subtitle C. Under this definition, the universe of potential hazardous wastes is extremely large and diverse. The regulatory definition evolves and changes as new information becomes available. EPA works closely with industry and the public to determine which of these wastes should be subject to the RCRA hazardous waste regulations. The Agency developed four defining characteristics of hazardous waste and four lists of specific hazardous wastes.

According to EPA estimates, of the 13 billion tons of industrial, agricultural, commercial, and household wastes generated annually, more than 279 million tons (2 percent) are “hazardous,” as defined by RCRA regulations.



## Characteristic Wastes

A waste is hazardous if it exhibits one or more of the following characteristics:

- *Ignitability.* Ignitable wastes can create fires under certain conditions or are spontaneously combustible. *Examples include waste oils and used solvents.*
- *Corrosivity.* Corrosive wastes are acids or bases that are capable of corroding metal, such as storage tanks, containers, drums, and barrels. *Battery acid is a good example.*
- *Reactivity.* Reactive wastes are unstable under “normal” conditions. They can cause explosions, toxic fumes, gases, or vapors when mixed with water. *Examples include lithium-sulfur batteries and explosives.*
- *Toxicity.* Toxic wastes are harmful or fatal when ingested or absorbed. When toxic wastes are disposed of on land, contaminated liquid may drain (leach) from the waste and pollute ground water. Toxicity is defined through a laboratory procedure called the Toxicity Characteristic Leaching Procedure (TCLP). The TCLP helps identify wastes likely to leach concentrations of contaminants that may be harmful to human health or the environment. *Certain chemical wastes and heavy metals are examples of potential toxic wastes.*

## Listed Wastes

By definition, EPA determined that some specific wastes are hazardous. These wastes are incorporated into lists published by the Agency. These lists are organized into three categories:

- *Source-specific wastes.* This list includes certain wastes from specific industries, such as petroleum refining or pesticide manufacturing. *Certain sludges and wastewaters from treatment and production processes in these industries are examples of source-specific wastes.*
- *Nonspecific source wastes.* This list identifies wastes from common manufacturing and industrial processes. *These include solvents that have been used in cleaning or degreasing operations.*
- *Commercial chemical products.* This list includes specific commercial chemical products in an unused form. *Some pesticides and some pharmaceutical products become hazardous waste when discarded.*

## What Is a Hazardous Waste?



To be considered “hazardous waste,” materials must first meet the legal definition of “solid waste.” Solid waste is discarded material, including garbage, refuse, and sludge (solids, semisolids, liquids, or contained gaseous materials).

Solid wastes that meet any of the following criteria are considered hazardous and subject to EPA regulations. Hazardous wastes are those that:

- Possess one or more of the four characteristics of hazardous waste.
- Are included on an EPA list of hazardous waste.
- Are a mixture of nonhazardous and hazardous waste listed solely for a characteristic (e.g., dirty water mixed with spent solvents).
- Derive from the treatment, storage, or disposal of a hazardous waste (e.g., incineration ash or emission control dust).
- Are soil, ground water, or sediment (environmental media) contaminated with hazardous waste.
- Are either manufactured objects, plant or animal matter, or natural geological material (debris) containing hazardous waste that are intended for disposal (e.g., concrete, bricks, industrial equipment, rocks, and grass).

## What Is not a Regulated Hazardous Waste?

The following are some of the wastes that have been excluded from RCRA hazardous waste regulations:

- Domestic sewage.
- Irrigation waters or industrial discharges allowed under the Clean Water Act.
- Nuclear material regulated by the Atomic Energy Act.
- Household wastes, even when they include hazardous materials, such as paints and pesticides.
- Certain mining and mineral processing wastes.

## Typical Hazardous Wastes Generated by Selected Industries

Waste Generators	Waste Type
Chemical manufacturers	<ul style="list-style-type: none"> <li>Strong acids and bases</li> <li>Reactive wastes</li> <li>Ignitable wastes</li> <li>Discarded commercial chemical products</li> </ul>
Vehicle maintenance shops	<ul style="list-style-type: none"> <li>Paint wastes</li> <li>Ignitable wastes</li> <li>Spent solvents</li> <li>Acids and bases</li> </ul>
Printing industry	<ul style="list-style-type: none"> <li>Photography waste with heavy metals</li> <li>Heavy metal solutions</li> <li>Waste inks</li> <li>Spent solvents</li> </ul>
Paper industry	<ul style="list-style-type: none"> <li>Ignitable wastes</li> <li>Corrosive wastes</li> <li>Ink wastes, including solvents and metals</li> </ul>
Construction industry	<ul style="list-style-type: none"> <li>Ignitable wastes</li> <li>Paint wastes</li> <li>Spent solvents</li> <li>Strong acids and bases</li> </ul>
Cleaning agents and cosmetic manufacturing	<ul style="list-style-type: none"> <li>Heavy metal dusts and sludges</li> <li>Ignitable wastes</li> <li>Solvents</li> <li>Strong acids and bases</li> </ul>
Furniture and wood manufacturing and refinishing	<ul style="list-style-type: none"> <li>Ignitable wastes</li> <li>Spent solvents</li> <li>Paint wastes</li> </ul>
Metal Manufacturing	<ul style="list-style-type: none"> <li>Paint wastes containing heavy metals</li> <li>Strong acids and bases</li> <li>Cyanide wastes</li> <li>Sludges containing heavy metals</li> </ul>

All listed wastes are presumed to be hazardous regardless of the concentrations of their constituents. They must be handled according to EPA's Subtitle C hazardous waste regulations. If, however, a company can demonstrate that its specific waste is not hazardous, the waste may be "delisted." Delisted wastes are no longer subject to Subtitle C regulations.

## Expanding Definitions

RCRA regulations were written so that all characteristic and listed hazardous wastes are regulated under Subtitle C. As newer technologies have become available and new multimedia (land, air, and water) modeling tools have emerged, EPA has been able to better evaluate the risks posed by different hazardous constituent concentration levels. Consequently, RCRA regulations can be refined to more closely match the risk of a waste with the appropriate management approaches. The Agency is altering its current approach to managing hazardous wastes so that some wastes will not be subject to full regulation as hazardous wastes. Some may fall out of the realm of Subtitle C requirements and will be managed as nonhazardous solid waste instead.



# Subtitle C: Controlling Hazardous Waste from Generation to Disposal

EPA designed the RCRA regulations to ensure proper management of hazardous waste from the moment the waste is generated until its ultimate disposal—“cradle to grave.” This step-by-step approach monitors and controls hazardous waste at every point in the waste cycle, thereby protecting human health and the environment from the dangers of mismanagement. This approach has two key elements:

- *Tracking.* A tracking system requires each facility handling waste to obtain an identification number. Generators must prepare a uniform manifest document to accompany any transported hazardous waste from the point of generation to the point of final disposal.
- *Permitting.* EPA or the states must issue a permit to facilities before they can treat, store, and dispose of hazardous waste. The permit prescribes enforceable management standards for the wastes.

The regulated community in this system includes those who generate, recycle, transport, treat, store, and dispose of hazardous wastes.

## The Regulated Community

### Generators

The hazardous waste management cycle begins with a generator—any person or business that produces hazardous waste or first causes hazardous waste to become subject to RCRA regulations.

Examples of generators include owners and operators of large manufacturing facilities, small businesses, universities, and laboratories.

Under the RCRA regulations, generators are responsible for determining whether their waste is hazardous and accounting for the final disposal of their waste. Generators are regulated according to the amount of waste they produce and are categorized into three groups:

- *Large Quantity Generators (LQGs)* are those that generate the largest amount of hazardous waste—more than 2,200 pounds (1,000 kilograms) per calendar month, which is about five full 55-gallon drums. Since this category includes about 20,000 companies that produce the majority of the nation's waste, these generators are regulated more stringently than their counterparts who generate less waste. *Examples of LQGs include pharmaceutical companies and chemical manufacturers.*
- *Small Quantity Generators (SQGs)* are those that generate between 220 pounds (100 kilograms) and 2,200 pounds (1,000 kilograms) of hazardous waste per calendar month. *Examples of SQGs include laboratories, printers, and dry cleaners.*
- *Conditionally Exempt Small Quantity Generators (CESQGs)* are those that generate less than 220 pounds (100 kilograms) of hazardous waste per calendar month. Because these generators produce a small amount of hazardous waste and because full regulation would present an economic burden on businesses, CESQGs are subject to very minimal requirements. *Examples of CESQGs include 1-hour photo labs and dental offices.*

RCRA regulations apply to facilities that manage waste on site, as well as to those that ship waste off site. About 98 percent of the nation's hazardous waste is treated or disposed of by generators on site. These generators are typically large businesses that can afford treatment equipment and possess the necessary space for storage and disposal. Smaller firms, and those in crowded urban locations, are likely to transport their waste off site where it is managed by a commercial firm or a publicly owned and operated facility.

Generators that send their waste off site are required to package, mark, and label their waste properly for transportation. Proper packaging ensures that no hazardous waste will escape from containers during transport. Marking and labeling enables transporters and public officials, including those who respond to emergencies, to rapidly identify the waste and its hazards.

## ***Hazardous Waste Minimization***

Proper hazardous waste management requires a waste minimization plan. To reduce the amount or toxicity of hazardous waste that must be managed (and therefore the amount of waste subject to regulation), many generators reduce, reuse, or recycle as part of their everyday practices. The most environmentally sound and economically efficient way of managing any waste is not to generate it in the first place (source reduction). Facilities can avoid creating hazardous wastes, or limit the amount created, by not mixing hazardous and nonhazardous wastes, by changing some materials or processes, and by safely storing hazardous products and containers to avoid spills and leaks.

If hazardous wastes are generated, they often can be recycled in an environmentally sound manner. In the context of hazardous waste management, there are certain practices or activities that are defined as recycling. A recycled material is one that is used, reused, or reclaimed. For example, cleaning solvents that become dirty through use can be filtered (reclaimed) and used again instead of being disposed of. The term “waste minimization” includes source reduction and environmentally sound recycling.

Wastes that cannot be recycled must be treated to reduce the toxicity of the hazardous constituents and the ability of the constituents to move throughout the environment. Treatment residues must be disposed of in an environmentally sound manner.

## **Transporters**

Transporters pick up properly packaged and labeled hazardous waste from generators and transport it to designated facilities that recycle, treat, store, or dispose of the waste. They must put proper symbols on the transport vehicle to identify the type of waste being transported. The U.S. Department of Transportation (DOT) jointly regulates the transportation of hazardous waste. DOT specifies the markings, labels, and packaging required to ship hazardous waste. These symbols, like the labels on the hazardous waste containers, enable firefighters, police, and other officials to identify the potential hazards immediately in case of an emergency. Because an accident involving hazardous waste could create very serious problems, EPA regulations also require transporters to comply with procedures for hazardous waste spill cleanup.

## **Treatment, Storage, and Disposal Facilities**

Treatment, storage, and disposal facilities (TSDFs) receive hazardous waste from generators or other TSDFs. *Treatment facilities* use various processes to

## Approaches to Waste Minimization

- Substitution of raw materials might offer the greatest opportunity for waste minimization. By replacing a raw material that generates a large amount of hazardous waste during its processing with one that generates little or none, manufacturers can substantially reduce their waste volume.
- Manufacturing process changes consist of either eliminating a process that produces a hazardous waste or altering a process so that it no longer produces the waste.
- Substitution of products can also be effective. For example, citrus-based solvents often can be used instead of chlorinated solvents for cleaning or coating.
- Recycling (also referred to as recovery and reuse) is the process of removing reusable elements from a waste and returning them to productive use. Generators commonly recycle solvents, acids, and metals.
- Source separation (or segregation) keeps hazardous waste from contaminating nonhazardous waste through management practices that prevent the wastes from coming into contact with each other. This is the cheapest and easiest method of reducing the volume of hazardous waste to be disposed of and is widely used by industry. In addition to reducing disposal costs, source separation reduces handling and transportation costs.

alter the character or composition of a hazardous waste. Some treatment processes enable waste to be recovered and reused in manufacturing settings, while other treatment processes reduce the volume or hazard of waste to facilitate further storage or disposal. *Storage facilities* hold hazardous waste temporarily until it is treated or disposed of. Treatment and storage activities take place in various units such as tanks, containers, incinerators, surface impoundments, containment buildings, and waste piles. *Disposal facilities* usually place hazardous waste in landfills or surface impoundments after it has been treated properly (see page 14 for more information).

One common method of treatment (and disposal) of hazardous waste is incineration, or combustion. In the United States, almost 300 facilities burn almost 4 million tons of hazardous waste in incinerators each year. Another 1 million is disposed of in other types of combustion facilities, known as boilers and industrial furnaces. These units offer an effective technology for managing much hazardous waste. The RCRA program specifically subjects these units to strict emissions controls and other requirements. In addition, all new units must receive a permit from the state or federal permitting agency to operate

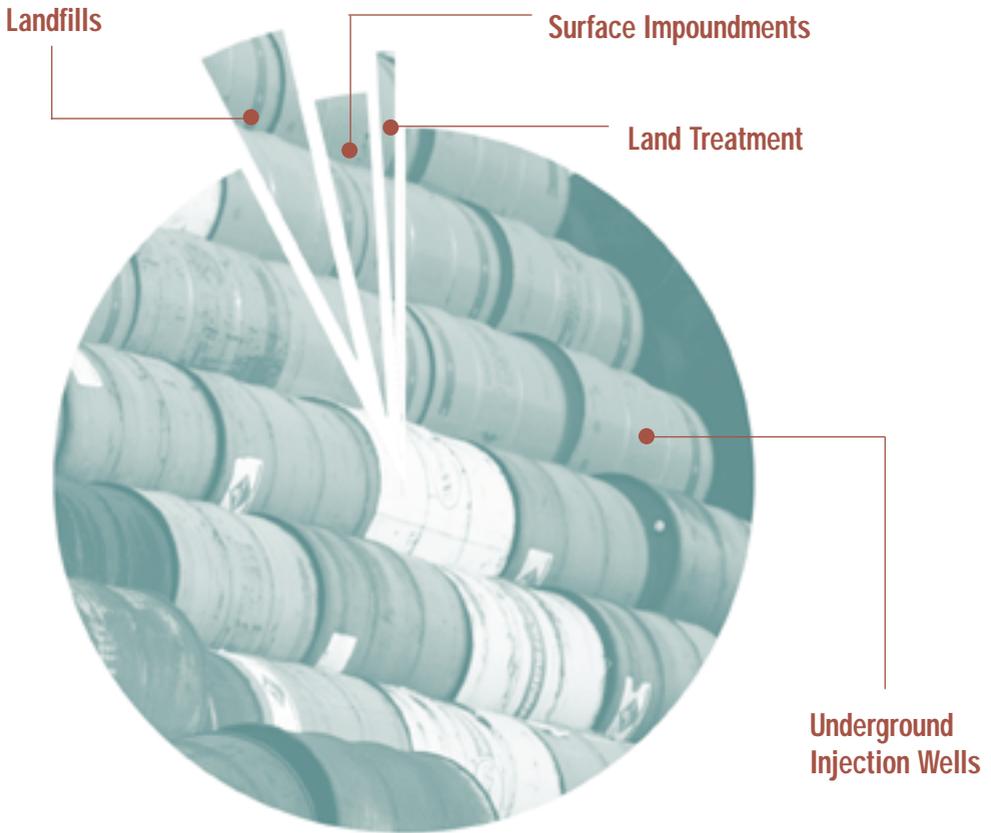
and must pass a test known as a trial burn, before operation begins to ensure that these units will not endanger human health or the environment (see page 19 on permitting). EPA continually evaluates the safety of hazardous waste combustion by examining and revising emissions standards.

### ***Land Disposal Restrictions***

About 23 million tons of hazardous waste are land disposed annually. This widespread disposal of hazardous waste in units located directly on the land has the potential to contaminate soil and ground water. To adequately protect

## **Types of Land Disposal**

- *Landfills* are disposal facilities where hazardous waste is placed in or on land. Properly designed and operated landfills are double-lined to prevent leakage. They also are equipped with systems that collect surface water runoff (like rain) that can come in contact with waste and become contaminated.
- *Surface impoundments* are double-lined natural or fabricated depressions or diked areas that can be used to treat, store, or dispose of hazardous waste. Surface impoundments may be any shape and any size (from a few hundred square feet to hundreds of acres in area). Surface impoundments are often referred to as pits, ponds, lagoons, and basins.
- *Underground injection wells* are steel- and concrete-encased shafts into which hazardous wastes are deposited by force and under pressure. Liquid hazardous wastes are commonly disposed of in underground injection wells. Injecting wastes into encased wells deep in underground land formations protects ground-water aquifers from risk of contamination.
- *Waste piles* are noncontainerized, lined accumulations of solid, nonflowing hazardous waste. While some are used for final disposal, many waste piles are used for temporary storage until the waste is transferred to its final disposal site.
- *Land treatment* is a disposal process in which hazardous waste is applied onto or incorporated into the soil surface. Natural microbes in the soil break down or immobilize the hazardous constituents. Land treatment facilities are also called land application or land farming facilities.



*In 1995, of all hazardous waste disposed of in or on the land, about 21 million tons were disposed of in underground injection wells, 1 million tons were disposed of in landfills, 575,000 tons were disposed of in surface impoundments, and 10,000 tons were disposed of by land treatment practices.*

public health and safety, hazardous wastes must be treated to minimize any risks before they can be disposed of in land disposal units.

RCRA's Land Disposal Restriction (LDR) program sets treatment standards and requires that hazardous wastes be treated before they are land disposed to destroy or immobilize hazardous constituents. All hazardous waste must be

# Common Hazardous Waste Treatment Technologies

Several processes exist for making hazardous wastes less hazardous:

- *Biological treatment* uses micro-organisms to break down hazardous organic compounds in a waste stream and make the waste less toxic.
- *Carbon adsorption* is a chemical process that removes hazardous substances from the waste using specially treated carbon. This method is particularly effective in removing organic compounds from liquid waste.
- *Dechlorination* removes chlorine from a substance to make it less toxic.
- *Glycolate dehalogenation* uses chemical substances to react with hazardous contaminants to change their structure and toxicity.
- *Incineration (or combustion)* destroys waste or makes it less hazardous through burning. Incineration is frequently used to destroy organic wastes.
- *Thermal treatment* uses elevated temperatures as the primary means of changing the chemical, physical, or biological character of a waste. (Examples include wet air oxidation, molten salt pyrolysis, and calcination.)
- *Neutralization* makes certain substances less acidic and other substances less alkaline.
- *Oxidation* makes a waste less toxic by combining it with oxygen.
- *Precipitation* removes solids from a liquid waste so that the hazardous solid portion can be disposed of safely.
- *Soil washing* uses water or a washing solution in mechanical processes to scrub soils and remove hazardous contaminants.
- *Solidification and stabilization* removes wastewater from a waste or changes it chemically, making it less likely to be transported by water.
- *Solvent extraction* separates hazardous constituents from oily wastes, oils, sludges, and sediments to reduce the volume of waste that must be disposed of.



treated so that the concentration of hazardous constituents is below a certain level established for each waste. There are numerous treatment technologies available and new ones continually being developed (see box on page 16).

## Used Oil Management Standards

EPA has established a set of required practices, or management standards, for recycling used oil and burning it for energy recovery. These are common-sense, good-business practices designed to maximize recycling and minimize disposal of used oil, as well as to ensure its safe handling. Used oil comes from automotive crankcases, machine lubricants, and industrial processes. During normal use, impurities, such as dirt, metal scrapings, water, or chemicals, can get mixed in with the oil so that in time the oil no longer performs well. Eventually, this oil must be replaced with virgin or re-refined oil to do the job at hand. Then, used oil must be either disposed of, recycled, or burned for energy recovery.

Used oil can be treated to remove hazardous contaminants and reused as a new lubricating oil or as a fuel. An estimated 380 million gallons of used oil are recycled each year. It takes 42 gallons of crude oil, but only 1 gallon of used oil, to produce 2-1/2 quarts of new, high-quality lubricating oil.

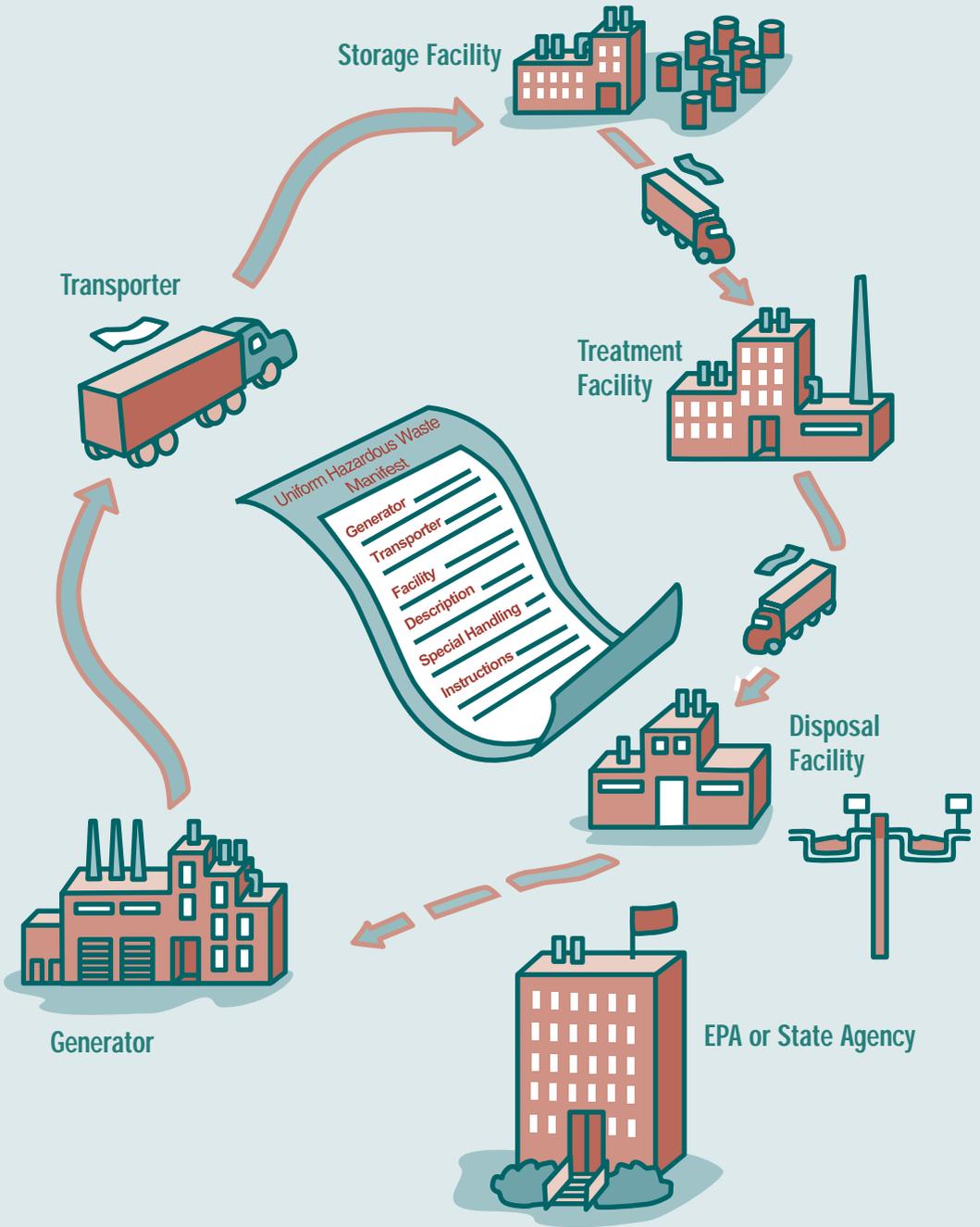
The used oil management system is designed to minimize the potential risks associated with used oil. These standards impose requirements on used oil generators, collection centers, transporters, and processors. The used oil program also imposes standards on used oil burners and marketers to ensure that the burning of used oil for energy recovery is conducted in a manner that is protective of the environment. For example, used oil destined for burning must be tested for hazardous contaminants and burned in units that can control hazardous air emissions. Used oil generators also can burn used oil in space heaters used at their place of business.

## The RCRA Structure

### The Tracking System

To assist in tracking shipments of waste, EPA requires LQGs, SQGs, transporters, and TSDFs to obtain EPA identification numbers. LQGs and SQGs must also prepare Uniform Hazardous Waste Manifests for each shipment of hazardous waste. A manifest is a form containing copies for all participants involved in the waste shipment. It identifies the type and quantity of waste and the gener-

*A manifest must accompany every waste shipment. The resulting paper trail documents the waste's progress through treatment, storage, and disposal. A missing form alerts the generator to investigate, which may mean calling in the state agency or EPA.*



ator, transporter, and facility to which the waste is being shipped. Generators must also certify on the manifest that they are minimizing the amount and toxicity of their waste and that the method of treatment, storage, or disposal they have chosen will minimize the risk to human health and the environment. When the waste reaches its final destination, the owner of that facility returns a copy of the manifest to the generator to confirm that the waste has arrived.

A hazardous waste manifest must accompany every waste shipment. The resulting documentation tracks the waste's progress to TSDFs. A missing form alerts the generator to investigate, which may mean calling the state agency or EPA.

If the waste does not arrive as scheduled, generators must immediately notify EPA or the authorized state agency so that it can investigate and take appropriate action. Generators, transporters, and TSDFs must retain copies of the manifest for 3 years. Every other year, generators also must provide information on their activities to their authorized state agency or EPA.

## The Permitting System

Owners or operators of TSDFs must obtain a permit in order to operate. A permit specifically allows a facility to treat, store, or dispose of hazardous waste and outlines the precautions that must be taken to manage the waste in a manner that adequately protects human health and the environment.

*New TSDFs* must receive a permit before they begin construction. *Operating TSDFs* with expiring permits must submit new permit applications 6 months before their existing permits run out. *TSDFs operating under interim status* must also apply for a permit. Congress granted interim status to facilities that already existed when RCRA was enacted or that were already operating when new wastes were listed. Interim status allows facilities to continue operating while their permit applications are being reviewed by the federal or state permitting agency. While both permitted and interim status TSDFs are subject to similar standards, the interim status standards are designed to be self-implementing. Generally, permitted and interim status TSDFs must:

- Analyze and identify wastes prior to treatment, storage, and disposal.
- Prevent the entry of unauthorized personnel into the facility by installing fences and surveillance systems, and by posting warning signs.
- Inspect the facility on a periodic basis to determine if there are any problems.
- Train employees in safe use of equipment and emergency response procedures.

- Prepare a contingency plan for emergencies and establish other emergency response procedures.
- Comply with the manifest system and with various reporting and record-keeping requirements.
- Comply with facility-specific standards as dictated in the permit.

In addition to these general requirements, all TSDFs must comply with specific design and operating standards for their hazardous waste treatment, storage, and disposal units. These standards are especially important for disposal units, which must ensure that disposed waste will not leach or otherwise escape into soil or ground water. Disposal unit standards:

- Ban liquids from landfills.
- Ban underground injection of hazardous waste within 1/4-mile of a drinking water well.
- Require stringent structural and design conditions, such as double liners, leachate collection systems, and ground-water monitoring.
- Limit facility sitings in unstable hydrogeologic areas.

EPA also established regulations to address air emissions from hazardous waste disposal since some hazardous waste compounds can evaporate into the air. To prevent such escapes into the atmosphere, EPA requires certain equipment to be used for recycling, treatment, storage, and disposal of some hazardous wastes.

### ***Closure and Financial Assurance***

RCRA regulations and permits set forth certain procedures that are designed to protect the environment and surrounding communities when owners and operators of hazardous waste facilities close their sites. In addition, RCRA sets standards for ground-water monitoring, disposal unit maintenance, and security measures that some owners and operators of hazardous waste facilities will need to follow for up to 30 years after the facility closes (known as postclosure care).

Closure activities can be expensive, and some facilities might not be able to cover these costs at the time of closure. For example, if a company undergoes bankruptcy and has little money left at the time of the closure of its TSDF, it might not be able to provide the required closure and postclosure care. To address this situation, RCRA regulations require owners and operators to:

- Establish separate, secure financial assurance mechanisms (such as trust funds, surety bonds, and letters of credit) to pay for completion of all closure and postclosure operations.
- Be prepared to pay for 30 years of ground-water monitoring, disposal unit maintenance, and security measures after the facility closes.
- Demonstrate financial assurance for third-party liability to cover any accidents or mismanagement that results in the release of hazardous waste. Such funds can be used to compensate citizens or other third parties for any damage to neighboring property or injury to human health.

## State Authorization

The hazardous waste regulatory program described in this document may be run by EPA or a state hazardous waste agency. Currently 47 states and two territories have been granted authority to run Subtitle C RCRA programs. As EPA continues to promulgate new or revised rules, states must become authorized to implement those rules. Thus, state authorization is an ongoing process.

EPA's regional offices implement and enforce RCRA in states and territories that do not have authorized programs. In states that are authorized, EPA can step in to assist states in enforcing the law, if needed. Otherwise, states that are authorized to operate RCRA programs oversee the hazardous waste tracking system in their state, operate the permitting system for hazardous waste facilities, ensure public participation requirements are met, act as the enforcement arm in cases where individuals or companies practice illegal hazardous waste management, and implement all other aspects of the RCRA program.

In terms of permitting hazardous waste facilities, authorized states are generally considered to be the "permitting agency."

# Citizen Action and Public Participation

The public plays an important role in the permitting process for both hazardous and municipal solid waste facilities. Facilities applying for a permit must involve the public in some aspects of the process. Businesses and the state or federal permitting agency also must make information available to the public. The public has opportunities to submit comments and request public hearings. The following are some of the ways in which the public can stay involved:

- When a business submits a permit application, it must hold an informal meeting with the public and advertise the meeting with signs and/or advertisements in the paper or radio. The business must explain the plans for the facility, including information about the proposed processes it will use and wastes it will handle. Members of the public can sign up on the facility's mailing list.
- When the permitting agency receives a permit application from the business, it sends a notice to everyone on the mailing list. The application is then available for public review.
- The permitting agency may require the business to set up a library for the public with available relevant documents, such as the permit application and reports.
- The permitting agency announces its decision about granting or denying the permit by sending a letter to everyone on the mailing list and placing a notice in a newspaper or broadcasting over the radio. It also issues a fact sheet to explain the decision. Once the notice is issued, the public has 45 days to comment on the decision. Citizens may request a public hearing by contacting the permitting agency.
- The permitting agency must consider and respond to all public comments when making its decision.
- The public has the right to appeal the final permit decision.

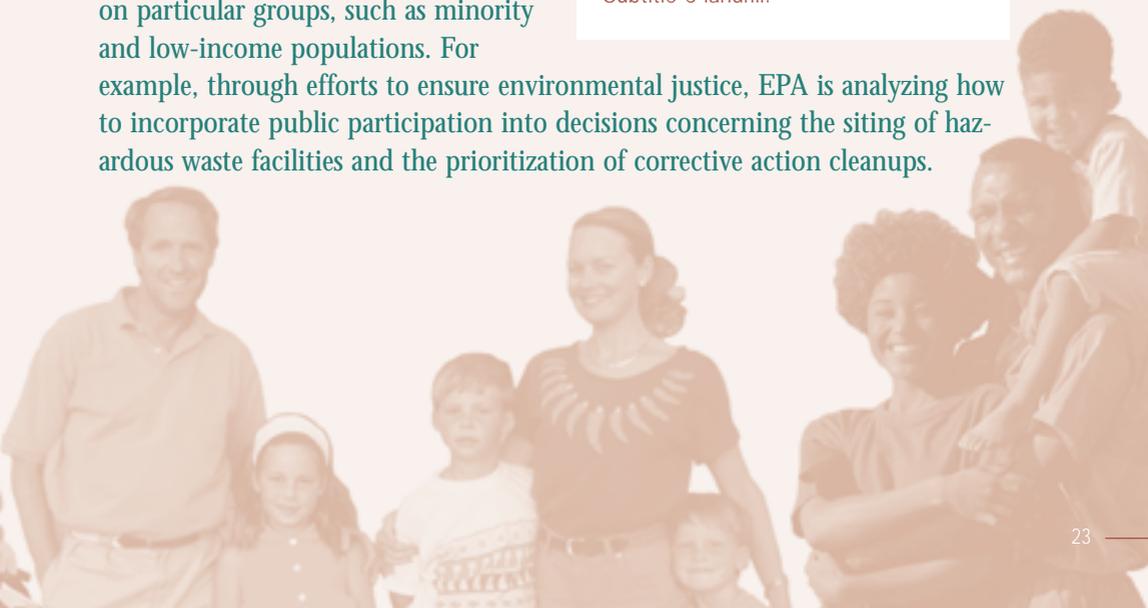
- The permitting agency must notify the public prior to a trial burn at a combustion facility by sending a notice to everyone on the facility mailing list.

Cleaning up hazardous waste facilities, known as corrective action, is also of concern to citizens and local communities. Since spills from TSDFs can affect entire municipalities, RCRA guarantees that the public will have a role in the facility cleanup process. For example, the corrective action process gives the public access to facility inspection information, requires public notice of remediation proceedings, and allows the opportunity for public comment and participation in the remedy selection process.

Public participation initiatives are also used to remedy the disproportionate effects of environmental pollution on particular groups, such as minority and low-income populations. For example, through efforts to ensure environmental justice, EPA is analyzing how to incorporate public participation into decisions concerning the siting of hazardous waste facilities and the prioritization of corrective action cleanups.

## More Ways to Participate

Many avenues exist for citizens to learn about and participate in what is happening around them, in addition to those offered under the RCRA program. A related law, known as the Emergency Planning and Community Right-to-Know Act, establishes a citizen's right to obtain information about toxic and hazardous chemicals handled at facilities in the community. One such avenue is the Toxics Release Inventory (TRI). Through this program, facilities across the country are required to report the quantities of 643 different toxic chemicals that are released into the environment each year. Facilities must report whether these toxic chemicals were released into the air or water or disposed of in underground injection wells or landfills. Facilities also have to indicate which releases were sent to a commercial Subtitle C landfill.



# Ground Water

## What Is It?

Ground water is water that naturally flows through and is retained in soil and rock bodies beneath the land. It is a major source of drinking water and of water used for agriculture in the United States. Almost half of this country's population depends upon ground water for some or all of its drinking water.



## Contamination

Ground-water contamination can occur when liquids (usually rainwater) move through waste disposal sites, carrying pollutants with them, and into the ground water. The resulting mixture of liquid and pollutant is called leachate. Once contaminated, ground water is expensive and difficult to clean up. All new hazardous waste disposal sites are equipped with leachate collection systems.

## Protection

RCRA regulations require ground-water monitoring, which detects early signs of contaminants leaching from hazardous waste disposal facilities. The most common monitoring device is a well from which samples of water are taken and analyzed for hazardous constituents.

RCRA regulations also require hazardous waste landfill and surface impoundment facilities to install double liners to protect against ground-water contamination. Liners are continuous layers of natural or synthetic materials, such as clay or plastic, that are placed beneath or on the sides of a landfill or surface impoundment and restrict the escape of hazardous waste into ground water.

# Subtitle D: Municipal And Industrial Solid Waste

**R**CRA also covers municipal solid waste (MSW) and nonhazardous industrial waste. MSW is common garbage or trash generated by homes, industries, and commercial and institutional offices. Industrial nonhazardous wastes are wastes and wastewaters generated by manufacturing processes that are not considered to be hazardous.



Communities across the United States currently generate more than 200 million tons of MSW every year. This amount averages to about 4 pounds per person per day. EPA encourages individuals and businesses to “reduce, reuse, and recycle” to decrease the amount of waste generated. EPA promotes a hierarchy of waste management options for businesses and municipalities, as follows:

1. The best option is to not generate waste in the first place or to reuse what you already have. This is known as **source reduction** or **waste prevention**. For example, individuals can prevent waste by leaving grass clippings on the lawn and by buying items with less packaging, such as bulk foods. Reusing items, such as bags and containers, instead of throwing them away reduces waste. Companies can buy reusable items, such as pallets, instead of disposable ones.
2. The second best option is **recycling** or **composting**. Many types of glass, paper, plastic, metal, and other assorted materials are recyclable. That means that it is technologically feasible for these materials to be broken down and remade into new prod-



ucts. To make this type of manufacturing economically feasible, people also need to buy products that are made from recycled materials. Many companies are recycling these types of materials, and common consumer goods are available with recycled content. Many municipalities and companies are also producing compost, a soil amendment, from yard trimmings from residents.

3. The final option for those materials that are not easily recyclable or compostable is disposal, either **landfilling** or **combustion** (preferably with energy recovery).

Approximately 60 percent of MSW is disposed of in landfills. Unlike their hazardous waste counterparts, federal MSW regulations do not require the treatment of waste before disposal. Although much of MSW consists of paper, aluminum cans, plastics, and other nontoxic items, some components, including batteries, and certain household products, such as cleaners, paints, stains, and pesticides, can present potential risks when improperly disposed of.

The Subtitle D program focuses on establishing standards, or criteria, for municipal solid waste landfills to ensure the safe management of MSW. The federal standards address the design, operation, and closure of MSW landfills. They impose restrictions on where such landfills may be located (e.g., not in a floodplain), and they require liners and ground-water monitoring. In addition, when these landfills become full, their closure is governed by specific procedures, as well as financial assurance requirements to pay for such operations.

## What Is in MSW?

Nationwide, MSW contains large percentages of paper and yard trimmings and a smaller percentage of metals, glass, plastics, food scraps, and other materials such as rubber, leather, textiles, and wood. Construction and demolition debris, automobile bodies, or municipal sewage are among the materials that are not considered MSW, according to the Agency's definition. Some states define the components somewhat differently.

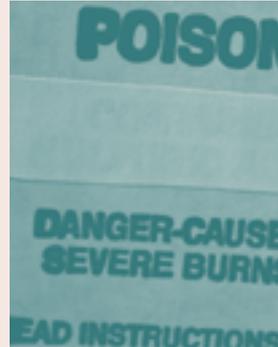
These federal standards are designed to be self-implementing by the owner or operator of a facility. State and tribal regulatory agencies provide the primary oversight and issue permits. EPA works with states and tribes to ensure that landfills continually minimize risks from waste.

Another category of Subtitle D waste is called industrial solid waste or industrial nonhazardous waste. This waste is not considered MSW or hazardous waste under Subtitle C. Each year, approximately 12,000 manufac-

## Household Hazardous Waste (HHW)

Households often discard many common items that contain hazardous constituents, such as paints, stains, oven cleaner, motor oil, batteries, and pesticides. If these items were generated in large quantities by a business or manufacturing facility, they might be regulated as a hazardous waste. Individuals generating these types of waste from their homes are exempt, however, from the hazardous waste regulations. Certain other types of residences are exempt as well, such as motels, hotels, and campgrounds. The average household in the United States generates about 20 pounds of HHW per year.

To reduce the risks of disposing of these items in MSW landfills or incinerators, many communities have established HHW collection programs. These programs aggregate HHW and ensure its safe disposal in facilities designed to treat or dispose of hazardous waste. More than 3,000 collection programs have been documented in all 50 states.



**Manufacturing facilities generate and manage an estimated 7.6 billion tons of industrial solid waste (about 97 percent in the form of wastewater) on site in surface impoundments, landfills, land application units, and waste piles. Most non-hazardous industrial waste is managed in surface impoundments.**



# Making RCRA Work

**T**hree additional elements to the RCRA program provide strength and extra insurance to minimize risks from waste: monitoring, corrective action for environmental cleanups, and enforcement.

## Monitoring

For EPA's Subtitle C program to be effective, all regulated groups must comply. To ensure compliance, state or federal officials inspect and monitor facilities regularly and take enforcement measures when necessary.

Inspection of a site is one of the RCRA program's most important monitoring tools. An inspection is required of all TSDFs at least once every 2 years and annually for state and federal facilities. During an inspection, regulatory personnel generally review the company's records, assess the facility's operating methods, and take waste samples, if needed. In particular, inspectors check for compliance with ground-water monitoring requirements, proper handling and labeling of wastes, and assurance of financial responsibility. If a facility is not complying with RCRA regulations, EPA or the state takes enforcement action.

## Corrective Action

Despite RCRA's numerous precautions to prevent the release of hazardous waste into the environment, accidents still happen, and contamination persists from past mismanagement of these wastes. EPA estimates that between 50 and 70 percent of all TSDFs have some degree of environmental contamination requiring detailed investigation and perhaps cleanup. Under a program entitled Corrective Action, EPA has the statutory authority to require permitted and interim status TSDFs to clean up hazardous waste contamination. In addition, EPA also may use a "catch-all" statutory provision to require corrective action at any type of facility, such as generator sites, to ensure that all waste released into the environment is cleaned up in a timely manner.

To achieve necessary cleanups, facilities investigate environmental contamination and take remedial action to correct any problems associated with releases that may occur. Similarly, releases of materials from MSW landfills and USTs also occur. The RCRA regulations in these program areas also feature specific provisions and procedures to ensure necessary corrective action.

## Enforcement

Enforcement may include civil and criminal penalties, orders to correct the violations, fines, and/or imprisonment. For minor violations, EPA or the state agency often notifies the facility through a letter or phone call that it is not in compliance and that legal actions will be taken if the owner or operator does not comply within a certain time period. For severe or recurrent violations, EPA or the state can levy a penalty on the owner or operator of up to \$27,500 per day for each day the facility fails to comply past the specified deadline. EPA or the state can also suspend the facility's permit to operate and can bring a criminal suit against a facility's owner or operator. Examples of potential criminal violations of RCRA include falsifying information on a manifest, report, or permit; transporting waste either without a manifest or to a facility without a permit; and disposing of hazardous waste without a permit. Furthermore, if a facility deliberately violates RCRA, thus endangering human health and the environment, the violator could receive up to 15 years in prison and a maximum \$250,000 fine.

On the other hand, to alleviate the use of time-consuming and expensive criminal and civil sanctions, EPA has established policies to allow more flexibility in the enforcement process, giving businesses the opportunity to mitigate

penalties for noncompliance and offering incentives for self-policing and self-auditing. EPA's enforcement strategy gives states the flexibility to create their own enforcement policies up front. One of EPA's new initiatives encourages both large and small facilities to voluntarily audit themselves, to disclose instances of noncompliance, and to make good faith efforts to promptly correct the violations in return for a reduction of applicable penalties. Similarly, when EPA does take enforcement action against a business, the Agency may include in the settlement or enforcement action provisions allowing the facility to conduct supplemental and beneficial environmental projects in order to mitigate penalties for noncompliance.

# Conclusion



**R**CRA is a response to a complex environmental management issue—one that is ultimately connected to the way our country operates, its heavy reliance on industrial production, and our technologically sophisticated lifestyles. As long as we demand the products that generate these wastes, we will need well-designed and well-operated facilities and sound alternatives for waste management. Technological change, population growth, and economic expansion present added environmental challenges. The cooperation of industry, government, and the public will ensure that these challenges are met.

The management of hazardous waste is a dynamic process that is continually being refined and updated based on new research, technology, and regulations. Since RCRA was enacted in 1976, substantial progress has been made in promoting a clean and safe environment while maintaining our nation's manufacturing and industrial strength. EPA continually works to protect the environment, while also achieving the following:

- Reduced administrative burdens on generators.
- Increased avenues for public participation.
- Increased flexibility to the regulated sectors for complying with RCRA requirements.
- Multimedia modeling, risk assessment technologies, and other state-of-the-art scientific practices.

We plan to continue pursuing partnerships with states, tribes, industry, and the public.



# Related Environmental Laws

**R**CRA is one of a series of laws regulating potentially harmful substances in the environment. These laws were developed at different points in time and reflect concerns about particular issues such as ground-water protection, water quality, air quality, and worker safety. Some laws address the same hazardous substances at different points in their existence. For example, RCRA may regulate the disposal of a particular hazardous waste, while the Occupational Safety and Health Act (OSHA) protects workers who are exposed to that same substance in the workplace. In another example, RCRA exempts certain wastewater treatment units from hazardous waste permit requirements, since these units are permitted under the Clean Water Act. Because the concerns addressed by these laws sometimes overlap, EPA works with the states and other federal agencies to help ensure that all aspects of environmental protection are well coordinated. EPA, in conjunction with other federal and state agencies, also attempts to identify and address areas not covered by existing laws.

Some of the environmental laws addressing hazardous substances include:

- *Atomic Energy Act* (EPA, U.S. Department of Energy, and U.S. Nuclear Regulatory Commission)—regulates nuclear energy production and nuclear waste disposal.
- *Clean Air Act* (EPA)—limits the emission of hazardous pollutants into the nation's air.
- *Clean Water Act* (EPA)—regulates the discharge of hazardous pollutants and sewage sludge into the nation's surface waters.

- *Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)* (EPA)—provides for the cleanup of inactive and abandoned hazardous waste sites.
- *Emergency Planning and Community Right-to-Know Act* (EPA)—addresses the storage of chemicals in communities, planning for accidental releases, and the availability of information on releases of toxic wastes to the public.
- *Federal Insecticide, Fungicide, and Rodenticide Act* (EPA)—regulates the registration and use of pesticides.
- *Hazardous Materials Transportation Act* (DOT)—governs the transportation of hazardous waste and materials.
- *Marine Protection, Research, and Sanctuaries Act* (EPA)—addresses waste disposal at sea.
- *Occupational Safety and Health Act* (U.S. Occupational Safety and Health Administration)—regulates hazards in the workplace, including worker exposure to hazardous substances.
- *Pollution Prevention Act* (EPA)—focuses on reducing the amount of pollution at the source and promoting recycling.
- *Safe Drinking Water Act* (EPA)—limits contaminant levels in drinking water.
- *Surface Mining Control and Reclamation Act* (U.S. Department of the Interior)—regulates the environmental aspects of mining (particularly coal) and reclamation.
- *Toxic Substance Control Act* (EPA)—regulates the manufacture, use, and disposal of certain chemical substances.



# CFR Guide to Hazardous and Solid Waste Regulations

To review the RCRA regulations related to the specific topics covered in this booklet, consult the following citations in Title 40 of the *Code of Federal Regulations*:

- Part 240—Guidelines for the thermal processing of solid wastes.
- Part 241—Guidelines for the land disposal of solid wastes.
- Part 243—Guidelines for the storage and collection of residential, commercial, and institutional solid waste.
- Part 256—Guidelines for development and implementation of state solid waste management plans.
- Part 257—Criteria for classification of solid waste disposal facilities and practices.
- Part 258—Criteria for MSW landfills.
- Part 260—Hazardous waste management system: general.
- Part 261—Identification and listing of hazardous waste.
- Part 262—Standards applicable to generators of hazardous waste.
- Part 263—Standards applicable to transporters of hazardous waste.
- Part 264—Standards for owners and operators of hazardous waste and specific types of hazardous waste management facilities.

- Part 265—Interim status standards for owners and operators of hazardous waste TSDFs.
- Part 266—Standards for the management of specific hazardous wastes and specific types of hazardous waste management facilities.
- Part 268—LDRs.
- Part 270—EPA administered permit programs: the Hazardous Waste Permit Program.
- Part 271—Requirements for authorization of state hazardous waste programs.
- Part 272—Approved state hazardous waste management programs.
- Part 273—Standards for universal waste management.
- Part 279—Standards for the management of used oil.
- Part 280—Technical standards and corrective action requirements for owners and operators of USTs.
- Part 281—Approval of state USTs.
- Part 282—Approved UST programs.



CORROSIVES



## For More Information

To obtain additional information, contact the following resources:

### EPA Resources:

#### RCRA/Superfund/EPCRA Hotline

RCRA/Superfund/EPCRA Hotline

401 M Street, SW.

Washington, DC 20460

Phone: 800 424-9346 or TDD 800 553-7672

In Washington, DC: 703 412-9810 or TDD 703 412-3323

Answers questions on matters related to solid and hazardous waste.

#### RCRA Docket Information Center (RIC)

U.S. Environmental Protection Agency

RCRA Docket Information Center (5305G)

401 M Street, SW.

Washington, DC 20460

Phone: 703 603-9230

Fax: 703 603-9234

E-mail: [rcra-docket@epamail.epa.gov](mailto:rcra-docket@epamail.epa.gov)

Home Page: <http://www.epa.gov/epaoswer>

Provides public access to all regulatory materials on solid waste and distributes technical and nontechnical information on solid waste.

### Small Business Ombudsman Clearinghouse/Hotline

U.S. Environmental Protection Agency

Small Business Ombudsman (1230C)

401 M Street, SW.

Washington, DC 20460

Phone: 800 368-5888

Fax: 703 305-6462

Helps private citizens, small businesses, and smaller communities with questions on all program aspects within EPA.

### Pollution Protection Information Clearinghouse (PPIC)

U.S. Environmental Protection Agency

Pollution Protection Information Clearinghouse

401 M Street, SW. (7409)

Washington, DC 20460

Phone: 202 260-1023

Fax: 202 260-4659

E-mail: [ppic@epamail.epa.gov](mailto:ppic@epamail.epa.gov)

Provides a library and an electronic bulletin board (accessible by any PC equipped with a modem) dedicated to information on pollution prevention.

### EPA Information Resources Center

U.S. Environmental Protection Agency

Headquarters Library

401 M Street, SW., Room M 2904

Washington, DC 20460

Phone: 202 260-5922

Fax: 202 260-6257

E-mail: [library-HQ@epamail.epa.gov](mailto:library-HQ@epamail.epa.gov)

Maintains environmental reference materials for EPA staff and the general public, including books, journals, abstracts, newsletters, and audio-visual materials generated by government agencies and the private sector. Also provides access to online computer service bulletin boards and CD-ROM systems.

### Other Resources:

#### National Response Center

Phone: 800 424-8802

TSDF owners or operators should call this number to report an emergency.

Emergencies could include fires, explosions, or other release of hazardous waste from a facility that could threaten human health. Emergencies also include spills that could reach surface water. The Response Center will evaluate the situation and help make appropriate emergency decisions.

## EPA Regional Offices:

### EPA Region 1

(Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont)

Hazardous Waste Programs

JFK Federal Building

Boston, MA 02203-2211

Phone: 617 565-3420

Library Phone: 617 565-3300 or 800 372-5427

Home Page: <http://www.epa.gov/region.01>

### EPA Region 2

(New Jersey, New York, Puerto Rico, Virgin Islands)

RCRA Compliance Branch

290 Broadway, 21<sup>st</sup> Floor

New York, NY 10007-1866

Phone: 212 637-3000

Library Phone: 212 637-3185

Home Page: <http://www.epa.gov/region.02>

### EPA Region 3

(Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia)

Hazardous Waste Management Division

841 Chestnut Street

Philadelphia, PA 19107

Phone: 215 566-5000 or 215 566-3110

Library Phone: 215 566-5364

Home Page: <http://www.epa.gov/region.03>

## EPA Region 4

(Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee)

RCRA Branch

Atlanta Federal Center

61 Forsyth Street, SW.

Atlanta, GA 30303

Phone: 404 562-8440

Library Phone: 404 562-8190

Home Page: <http://www.epa.gov/region.04>

## EPA Region 5

(Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin)

Waste, Pesticides, and Toxics Division

77 West Jackson Boulevard

Chicago, IL 60604

Phone: 312 353-2000 or 312 886-7435

Library Phone: 312 353-2022

Home Page: <http://www.epa.gov/region.05>

## EPA Region 6

(Arkansas, Louisiana, New Mexico, Oklahoma, Texas)

Hazardous Waste Enforcement Branch

1445 Ross Avenue

Dallas, TX 75270

Phone: 214 655-6444

Library Phone: 214 665-6424

Home Page: <http://www.epa.gov/region.06>

## EPA Region 7

(Iowa, Kansas, Missouri, Nebraska)

Hazardous Waste Branch

726 Minnesota Avenue

Kansas City, KS 66101-2728

Phone: 913 551-7000

Library Phone: 913 551-7241

Home Page: <http://www.epa.gov/region.07>

## EPA Region 8

(Colorado, Montana, North Dakota, South Dakota)

Pollution Prevention Division

One Denver Place

999 18th Street, Suite 500

Denver, CO 80202-2466

Phone: 303 312 6312

Home Page: <http://www.epa.gov/region.08>

## EPA Region 9

(Arizona, California, Hawaii, Nevada, American Samoa, Guam)

Superfund/Hazardous Waste Division

75 Hawthorne Street

San Francisco, CA 94105

Phone: 415 744-1305 or 415 744-1730

Library Phone: 415 744-1500

Home Page: <http://www.epa.gov/region.09>

## EPA Region 10

(Alaska, Idaho, Oregon, Washington)

Waste and Chemical Management Branch

1200 Sixth Avenue

Seattle, WA 98101

Phone: 206 553-1200

Library Phone: 206 553-1289

Home Page: <http://www.epa.gov/region.10>

# Glossary

The following acronyms and words are used throughout the document.

## Acronyms

These acronyms are defined below under their full names.

CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
HHW	Household Hazardous Waste
LDR	Land Disposal Restrictions
LQG	Large Quantity Generator
MSW	Municipal Solid Waste
RCRA	Resource Conservation and Recovery Act
SQG	Small Quantity Generator
TRI	Toxics Release Inventory
TSDF	Treatment, Storage, and Disposal Facility
UST	Underground Storage Tank

## Definitions

**Characteristic Wastes**—Wastes can be defined as a hazardous waste if they exhibit one or more of the following characteristics: ignitability, corrosivity, reactivity, and toxicity. Those that possess these characteristics are known as characteristic wastes.

**Code of Federal Regulations**—This document codifies all the rules made by the executive departments and agencies of the federal government. It is divided into 50 volumes, known as titles, that represent broad areas subject to federal regulation. **Title 40** of the CFR (referenced as 40 CFR) lists all environmental regulations, including those discussed in this document.

**Composting**—The natural biological decomposition of organic material in the presence of air to form a humus-like material. Controlled methods of composting include mechanical mixing and aerating or placing the compost in open air

piles and mixing or turning it periodically. Homeowners can also compost waste in their backyards to help reduce the amount of waste going to landfills.

**Conditionally Exempt Small Quantity Generator**—Generators of less than 220 pounds of hazardous waste per calendar month are known as CESQGs. These are subject to only minimal regulations.

**Corrective Action**—The process of remediating or cleaning up a spill or release of contaminants into the environment.

**Generator**—Any person or business that produces hazardous waste or first causes hazardous waste to become subject to RCRA regulations. Generators include small or large businesses, manufacturing plants, or other facilities. Generators are subject to specific hazardous waste regulations.

**Hazardous Waste**—Wastes that meet EPA's definition for solid waste and possess the characteristics of ignitability, corrosivity, reactivity, or toxicity (as defined by RCRA) or are included on an EPA list of hazardous wastes are considered to be hazardous.

**Hazardous Waste Minimization**—Reducing the amount or toxicity of waste produced by a generator, by either source reduction or environmentally sound recycling.

**Household Hazardous Waste**—Items such as paints, stains, oven cleaner, motor oil, and batteries are commonly disposed of in the trash by households. While these items are not regulated as hazardous waste, they contain hazardous constituents. HHW refers to items such as these that can be disposed of in MSW landfills but are often collected by communities and managed as hazardous waste.

**Land Disposal Restrictions**—These rules require that hazardous wastes be treated before they are land disposed to destroy or immobilize hazardous constituents that might otherwise migrate into soil and ground water.

**Landfills**—Specially designed disposal units for disposal of hazardous or solid waste. Modern landfills generally have double synthetic liners to prevent releases and are covered and maintained when the landfills are no longer used.

**Large Quantity Generator**—Generators that produce more than 2,200 pounds (1,000 kilograms) of hazardous waste per calendar month (about five full 55-gallon drums) are considered to be LQGs. They must follow certain regulations.

**Listed Wastes**—Specific wastes determined by EPA to be hazardous and published in EPA lists are called listed wastes. These lists are organized into three categories: source-specific wastes, nonspecific source wastes, and commercial chemical products.

**Manifest**—A multicopy shipping form used to identify the type and quantity of waste, the generator, the transporter, and the TSDF to which the waste is being shipped. The manifest includes copies for all participants in the waste shipment chain and is often obtained from the state agency.

**Municipal Solid Waste**—Discarded material, such as common garbage or refuse generated by industries, commercial and institutional facilities, and homes.

**Nonhazardous Industrial Waste**—Wastes and wastewaters from manufacturing facilities regulated under Subtitle D that are not considered to be MSW, hazardous waste, or other wastes under Subtitle C and D.

**Permit**—An official license that specifically allows a facility to treat, store, or dispose of hazardous waste and outlines the precautions that must be taken to manage the waste in a manner that adequately protects human health and the environment. Owners or operators of hazardous waste TSDFs must obtain a permit in order to operate.

**Recycling**—The series of activities by which discarded materials are converted into raw materials and used in the production of new products.

**Regulatory Agency**—Either the EPA or state agencies are responsible for implementing, monitoring, and enforcing the RCRA program.

**Resource Conservation and Recovery Act**—This Congressional act encourages environmentally sound methods for disposal of household, municipal, commercial, and industrial waste. Its primary goals are to protect human health and the environment from the potential hazards of waste disposal, conserve energy and natural resources, reduce the amount of waste generated, and ensure that wastes are managed in an environmentally sound manner. RCRA is divided into sections called Subtitles.

**Small Quantity Generator**—Generators of between 220 pounds (100 kilograms) and 2,200 pounds (1,000 kilograms) of hazardous waste per calendar month are considered to be SQGs. They are regulated to a lesser degree than LQGs.

**Solid Waste**—Discarded material, such as garbage, refuse, and sludge (including solids, semisolids, liquids, or contained gaseous material), is considered to be solid waste.

**Source Reduction**—This refers to the design, manufacture, purchase, or use of materials to reduce the amount or toxicity of the materials before they enter the waste stream.

**State Authorization**—The process by which states are given authority to run the RCRA program instead of EPA.

**Subtitle C**—This section of RCRA establishes a regulatory framework for managing the generation, storage, treatment, and disposal of certain wastes defined as hazardous wastes.

**Subtitle D**—This section of RCRA establishes a system for managing solid waste, including both garbage/trash and nonhazardous industrial waste.

**Subtitle I**—This section of RCRA regulates toxic substances and petroleum products stored in underground storage tanks, such as at commercial gas stations.

**Surface Impoundments**—Lined natural or synthetic depressions or diked areas that can be used to treat, store, or dispose of waste.

**Toxics Release Inventory**—The TRI database compiles information submitted by certain federal and manufacturing facilities. These facilities are required to report on releases to the environment of 643 specific chemicals, listed by EPA.

**Transporter**—Hazardous waste transporters pick up properly packaged and labeled hazardous waste from generators and transport it to designated facilities that treat, store, recycle, or dispose of the waste. Transporters are subject to specific hazardous waste regulations, both by EPA and DOT.

**Treatment, Storage and Disposal Facility**—Facilities that receive hazardous waste from generators or other facilities for treatment, storage or disposal of waste are known as TSDFs.

**Underground Injection Wells**—Steel- and concrete-encased shafts into which hazardous wastes are deposited by force and under pressure.

**Underground Storage Tank**—Tanks located below the surface of the ground that store petroleum or chemical products are known as USTs.

**Unit**—This term generally refers to tanks, containers, incinerators, surface impoundments, containment buildings, and waste piles.

**Waste Piles**—Noncontainerized, lined or unlined accumulations of solid, non-flowing waste.

**Waste Prevention**—See source reduction.