



Environmental Indicators Initiative

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Better Protected Land

Waste and Contaminated Lands

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“Waste” is broadly defined as unwanted material left over from manufacturing processes or refuse from places of human or animal habitation. Within that category are many types of waste, including **municipal solid waste**, hazardous waste, and **radioactive waste**, which have properties that may make them dangerous or capable of having a harmful effect on human health and the environment.⁶⁷ Waste and **contaminated lands** are particularly important to environmental health because they may expose land and living organisms to harmful material if they are not properly managed.

There have been major improvements in managing the nation’s waste and in cleaning up contaminated sites. National, state, tribal, and local waste programs and policies aim to prevent **pollution** by reducing the generation of wastes at their source and by emphasizing prevention over management and subsequent disposal. Preventing pollution before it is generated and poses harm is often less costly than **cleanup** and **remediation**. Source reduction and recycling programs often can increase resource and energy efficiencies and thereby reduce pressures on the environment. When wastes are generated, EPA, state environmental programs, and local municipalities work to reduce the **risk** of exposures. If land is contaminated, cleanup programs address the sites to prevent human exposure and ground water contamination. Increased recycling protects land resources and extends the life span of disposal facilities.

How much and what types of waste are generated and managed?

Waste and Contaminated Lands Indicators
Quantity of municipal solid waste (MSW) generated and managed
Quantity of RCRA hazardous waste generated and managed
Quantity of radioactive waste generated and in inventory
Number and location of municipal solid waste (MSW) landfills
Number of RCRA hazardous waste management facilities
Number and location of Superfund national priority list sites
Number and location of RCRA corrective action sites

The types of waste generated range from yard clippings to highly concentrated hazardous waste. Only three types of waste—municipal solid waste (MSW), hazardous waste (as defined by the Resource Conservation and Recovery Act [RCRA]), and radioactive waste—are tracked with any consistency on a national basis. Other types of waste, for which no or very limited national data exist, are listed in the box, “**Other Types of Waste**,” and are described in detail in [Appendix B](#).

MSW, commonly known as trash or garbage, is one of the nation’s most prevalent waste types. In 2000, the U.S. generated approximately 232 million tons of MSW, primarily in homes and workplaces—an increase of nearly 160 percent since 1960.⁶⁸ During that time, the population increased 56 percent, and gross domestic product increased nearly 300 percent.⁶⁹ In 2000, each person generated approximately 4.5 pounds of waste per day—or about 0.8 tons for the year—a per-capita generation increase from 2.7 pounds per day in 1960.⁷⁰ For the last decade, per capita generation has remained relatively constant, and the amount of MSW recovered (recycled or composted) increased more than 1,100 percent, from 5.6 million to 69.9 million tons in total (Exhibit 3-9).⁷¹ Combustion (incineration) is also

used to reduce the volume of waste before disposal. Approximately 33.7 million tons (14.5 percent) of MSW were combusted in 2000.⁷² Of that amount, approximately 2.3 million tons were combusted for energy recovery—a process

where energy is produced from waste combustion and made available for other uses.⁷³

The term “RCRA hazardous waste” applies to hazardous waste (waste that is ignitable, corrosive, reactive, or toxic) that is regulated under the RCRA. In 1999, EPA estimated that 20,000 businesses generating large quantities—more than 2,200 pounds each per month—of hazardous waste collectively generated 40 million tons of RCRA hazardous waste.⁷⁴ Comparisons of annual trends in hazardous waste generation are difficult because of changes in the types of data collected (e.g., exclusion of wastewater) over the past several years. But the amount of a specific set of priority toxic chemicals found in hazardous waste and tracked in the Toxics Release Inventory is declining, as previously discussed under “Chemicals in the Landscape.” In 1999, approximately 69 percent of the RCRA hazardous waste was disposed of on land by one of four disposal methods: deep well/underground injection, landfill disposal, surface impoundment, or land treatment/application/farming.⁷⁵

In 2000, approximately 600,000 cubic meters of different types of radioactive waste were generated, and approximately 700,000 cubic meters were in storage awaiting disposal.⁷⁶ By volume, the most prevalent types of radioactive waste are contaminated environmental media (i.e., soil, sediment, water, and sludge requiring cleanup or further assessment) and low-level waste. Both of these waste types typically have the lowest levels of radioactivity when measured by volume. Additional radioactive wastes in the form of spent nuclear fuel (2,467 metric tons of heavy metal) and high-level waste “glass logs” (1,201 canisters of vitrified high-level waste) are in storage awaiting long-term disposal.⁷⁷ Very small amounts of those wastes are still being generated. For example, less than 1 cubic meter of spent nuclear fuel was generated in 2000. The total amount of radioactive waste being generated is expected to drop over the next few decades as cleanup operations are completed.⁷⁸

As previously mentioned, other types of waste for which national data are not available or are not current are listed below and described in [Appendix B](#). These other types of waste contribute a substantial amount to the total waste “universe,” although the exact percentage of the total that they represent is unknown.

What is the extent of land used for waste management?

Between 1989 and 2000, the number of municipal landfills in the U.S. decreased substantially—from 8,000 to 2,216.⁷⁹ The combined capacity of all landfills, however, remained relatively constant because newer landfills typically have larger capacities. In 2000, municipal landfills received approximately 128 million pounds of MSW, or about 55 percent of what was generated.⁸⁰ In addition to municipal landfills, the nation had 18,000 surface impoundments—ponds used to treat, store, or dispose of liquid waste—for non-hazardous industrial waste in 2000.⁸¹

Excluding wastewater, nearly 70 percent of the RCRA hazardous waste generated in 1999 was disposed of at one of the nation’s RCRA treatment, storage, and land disposal facilities. Of the 1,575 RCRA facilities, 1,049 are storage-only facilities. The remaining facilities perform one or more of several common management methods (e.g., deepwell/underground injection, metals recovery, incineration, landfill disposal).⁸²

The nation also uses other sites for waste management and disposal, but there are no comprehensive data sets that assess those additional sites or the extent of land now used nationally for waste management in general. Before the 1970s, waste was not subjected to today’s legal requirements to reduce toxicity before disposal and was typically disposed of in open pits. Early land disposal units that still pose threats to human health and the environment are considered to be contaminated lands and are subject to federal or state cleanup efforts.

What is the extent of contaminated land?

Many of the contaminated sites that must be managed and cleaned up today are the result of historical contamination. Located throughout the country, contaminated sites vary tremendously. Some sites involve small, non-toxic spills or single leaking tanks, whereas others involve large acreages of potential contamination such as abandoned mine sites. To address the contamination, federal and state programs use a variety of laws and regulations to initiate, implement, and enforce cleanup. The contaminated sites are generally classified according to applicable program authorities, such as RCRA Corrective Action, [Superfund](#), and state cleanup programs.

Although many states have data about contaminated sites within their boundaries, the total extent of contaminated

Other Types of Waste

- Extraction wastes
- Industrial non-hazardous waste
- Household hazardous waste
- Agricultural waste
- Construction and demolition waste
- Medical waste
- Oil and gas waste
- Sludge

land in the U.S. is unknown because few data are aggregated for the nation as a whole and acreage estimates are generally not available. A nationally accurate assessment would require both more detailed information on specific sites—such as the area of each site—and consistent aggregation of those data nationally. To assess the full nature of “extent” would require data on specific contaminants, as well as an assessment of risks, hazards, and potential for exposure to those contaminants.

The most toxic abandoned waste sites in the nation are listed on the [Superfund National Priorities List \(NPL\)](#) (Exhibit 3-10). Thus, examining the NPL data—along with data on RCRA corrective action sites—provides an indication of the extent of the most significantly contaminated sites. NPL sites are located in every state and several territories. As of October 2002, there were 1,498 final or deleted NPL sites.⁸³ An additional 62 sites were proposed to the NPL.⁸⁴ (When a “proposed” site meets the qualifications to be cleaned up under the Superfund Program, it becomes a final NPL site. Sites are considered for “deletion” from the NPL list when cleanup is complete.) Of the 1,498 sites, 846 sites are “construction completion sites,” which are former toxic waste sites where physical construction for all cleanup actions are complete, all immediate threats have been addressed, and all long-term threats are under control. This is up from 149 construction completes in 1992.

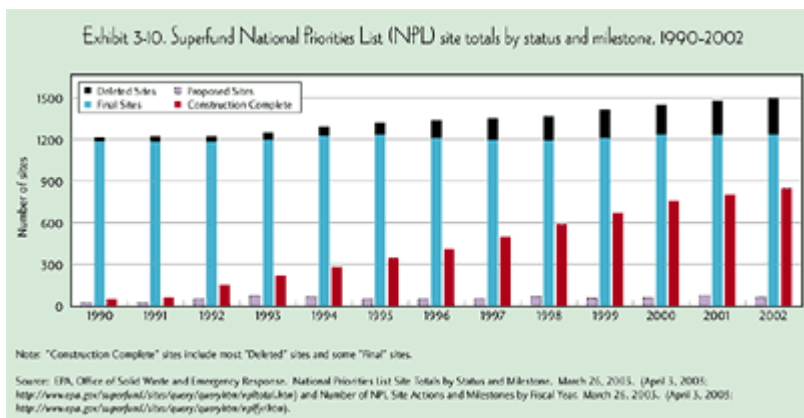


Exhibit 3-10: Superfund National Priorities List (NPL) site total by status and milestone, 1990-2002
[\(Click to enlarge\)](#)

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