

# The Science of Managing Waste

The science of managing waste has come a long way since the days of unlined “garbage dumps.” Today, we’re not only working to provide safe and environmentally sound long-term waste disposal, but we’re also continuously improving our technology—for example, by turning trash into energy.

## Today’s landfills

Key elements of a typical municipal solid waste landfill include:

- An engineered cap system. When a landfill reaches its capacity, a cap is installed. This is designed to provide a secure, long-term cover, and includes a drainage layer to prevent excess water from entering the landfill.
- Operational practices that include placing at least six inches of soil or an alternate daily cover on top of deposited waste at the end of each day.
- A liner system that includes a prepared subgrade, a layer of compacted clay, and a geotextile/geomembrane layer designed to prevent the escape of any waste.
- The liner also includes a network of pipes to collect and remove leachate for proper treatment and disposal. (“Leachate” is the term for liquid that accumulates in a landfill.)



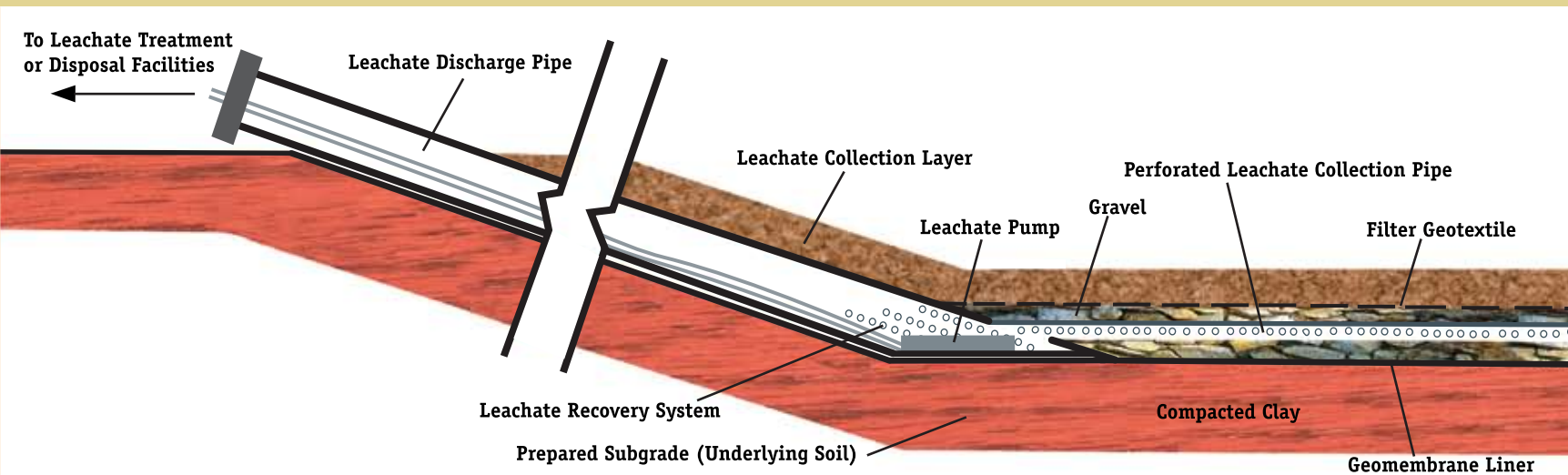
To safeguard the environment, landfills are monitored throughout their operational lifespan, and for 30 years after they are closed.



Across the U.S. and Canada, a number of Waste Management locations have earned certification by the international Wildlife Habitat Council for the quality of the habitat they maintain. As of 2005, WM facilities provide more than 17,000 acres of protected land for wildlife.



In some cases, closed landfills have been developed for alternate uses, such as golf courses, recreational areas, and wildlife preserves.



## The life cycle of a landfill



Landfills are built to environmental standards to contain the waste deposited in them.

Waste is deposited in small portions of a landfill called cells. The use of a small “working face” reduces litter.



At the end of a working day, at least six inches of cover material is placed over the waste deposited that day. This helps to control litter and odors, and also compacts the waste.

When one or more cells reach their capacity, an engineered cap system is installed, and native vegetation is planted on top. The cap stabilizes and protects the structure, prevents erosion, keeps precipitation out of the landfill, and provides a stable, long-term cover.



## Waste-based energy

Waste Management is converting waste into energy in two ways:

### 1. Waste-to-energy

For more than 30 years, our Wheelabrator subsidiary has been producing renewable energy from municipal solid waste. At 16 sites around the country, we’re using municipal solid waste to produce enough clean, renewable electricity to power 650,000 homes, saving the equivalent of 6.8 million barrels of oil each year.



### 2. Landfill gas-to-energy

At a large and growing number of our landfills, we have installed landfill gas-to-energy plants. These plants take advantage of the “green energy” that is provided by landfill gas (this is a natural by-product of the decomposition of organic waste in a landfill). Landfill gas is collected through a network of pipes inside a landfill, and conveyed to the plant, where it powers turbine or reciprocating engines that produce electricity.



- It is capped with a protective cover system, and native vegetation is planted to prevent erosion.
- To protect human health and the environment, landfills are monitored for 30 years after they are capped.
- Closed landfills have been developed into wildlife preserves as well as community recreational areas.

Routine environmental monitoring is conducted throughout a landfill’s life cycle.

