

# Landfill Gases



## Introduction

Gases released from municipal solid waste (MSW) landfills have the potential to cause odors in surrounding neighborhoods and property.

Landfill gas odors are produced by bacterial or chemical processes and can come from both active and closed landfills. Wind may carry these odors away from the landfill. Landfill odors also may be produced by the disposal of certain types of waste such as manures and fermented grains.

Over time, bacteria causes the waste brought to landfills to decompose. Gases are generated both from the materials as well as from decomposition. The amount of gas formed during decomposition – or the breaking down of waste – depends on a variety of factors including:

- **The type and moisture content of the waste;**
- **Amount of oxygen present;** and
- **Temperature inside the landfill.**

## How do these gases get into the air?

Gases generated in the landfill tend to rise through the landfill and reach the air above. The rate at which this occurs is affected by landfill content and by the weather. The amount of gases released will vary from landfill to landfill and will be different for a single landfill at different times (i.e., due to changing weather, changing moisture content and changing landfill content).

Methane and carbon dioxide are the major gases produced by the bacterial decay of landfill waste (U.S. Environmental Protection Agency, 1991). Both are odorless. Other gases produced by landfill bacteria are called sulfides. They have a distinct odor that give

landfills what many people describe as a “rotting” smell. Each person’s ability to smell varies. Some people can detect odors at lower concentrations than others. Concentrations of landfill gas are generally small, however, sulfides can cause unpleasant odors even at low levels.

Once released into the air, landfill gases are carried on surface level winds. While this dilutes the gases with fresh air, it also can move them into the surrounding area. Naturally, wind speed and direction determine whether nearby persons will notice landfill odors so that the degree of the problem will vary greatly from day to day.

The time of day that odors are generally the worst tends to be early morning. This is when the air is more still and the gases are not diluted.

## How can odors be reduced?

Active gas collection systems can be used to control the migration of landfill gas and odors. These systems extract gas from the landfill through a series of wells and piping networks.

Landfill gas is collected and destroyed via a flare on site or used in a gas-to-energy recovery system for power production. Covering the waste on a daily basis with soil also may help reduce odor.

## Want to learn more about landfills?

For more information about landfills and how they work, please visit [www.scdhec.gov/environment/land-and-waste-landfills](http://www.scdhec.gov/environment/land-and-waste-landfills).

## About this Fact Sheet ...

This fact sheet was provided by the S.C. Department of Health and Environmental Control’s Division of Mining and Solid Waste Management.