

# How Water Works

ILLUSTRATED PROCESSES, EQUIPMENT, AND TECHNOLOGY

## Groundwater Sources: Common Terms Associated with Wells

**G**roundwater is an important resource in North America, representing the principal source of potable water for about 40 percent of the continent's population. Groundwater sources are relatively simple to develop and often require little or no treatment before use. Wells are the most common way to access groundwater. Although wells come in several different forms with varying components, the principal parts of a typical well are labeled here.

1. A sanitary seal at the surface prevents contamination from entering the well, with a metal plate and rubberized gasket that fits snugly into the top of the well casing. The seal has openings for the discharge pipe (1a), the pump power cable (not illustrated), and an air vent (1b) to let air into the casing as the water level drops. A screened drain (1c) relieves overflow in the casing.
2. The well casing, a liner placed in the borehole, prevents the walls from caving in. The well casing is generally made of steel or plastic pipe.
3. Grout fills the annular space between the casing and the borehole to help prevent water from traveling along the outside of the casing and to support the casing.
4. The well slab, a concrete area around the casing, supports well pumping equipment and helps prevent surface water from contaminating the well water.
5. A well screen (intake screen) prevents rock and soil from entering the well while it lets in water.
6. Gravel is packed between the screen and the soil as a barrier to filter sand and sediment that would otherwise get into the well.
7. The static water level is the natural water surface in the aquifer when the pump isn't operating, measured as the depth from the ground surface to the water surface.
8. The pumping water level, the depth at which the water level stabilizes during pumping, varies with pumping rate.
9. The drawdown is the drop in water level between the static water level and the pumping water level.
10. The cone of depression is the flow of water in the aquifer from all directions toward the well during pumping that takes the shape of an inverted cone or curved funnel.

*Illustration elements exaggerated for emphasis.*

**LOW-YIELD  
AQUIFER**

**HIGH-YIELD  
POROUS  
AQUIFER**

