

This simple demonstration helps explain how groundwater flows through different soil types and can be used to help understand the cause of localized flooding, wet basements, and even how shallow wells work.



To understand how groundwater flows from the ground and into point wells and gravel well (shallow wells), imagine you have a 5 gallon bucket. Now, imagine you fill it a third of the way with clay. Next, fill it another third of the way with silty, fine (like the beach) sand. Lastly, fill the bucket to the top with gravel and coarse sand. Now we have a bucket with three distinct layers of different soil types. Now attempt to fill the bucket with water by repeatedly dumping cupfuls of water into it. As you can imagine, the water will easily flow through the first layer of soil (the coarse sand and gravel). The water, when it reaches the second layer (the fine sand) will slow down, maybe even create a temporary puddle on the top of its layer that will disappear gradually as the water continues to seep downward.

When the water reaches the top of the last layer (the clay) it will stop flowing down and just sit there and on top of the clay. Eventually, some of the water will be absorbed by the clay while the rest sits on top. As we continue to dump water into the bucket, its level rises above the clay layer, slowly filling the layer of fine sand with water and pushing the air out at the same time. This process speeds up through the top layer of coarse sand and gravel until the bucket is full of only water and soil, as the air spaces between the grains of soil has been pushed out and replaced with water. Each layer of soil is now *saturated*.

Attempting to install a point well or gravel well is like putting a long straw into each layer of soil and trying to suck the water out. Intuitively, you can imagine how it can be done easily in a saturated layer of coarse sand and gravel.

