

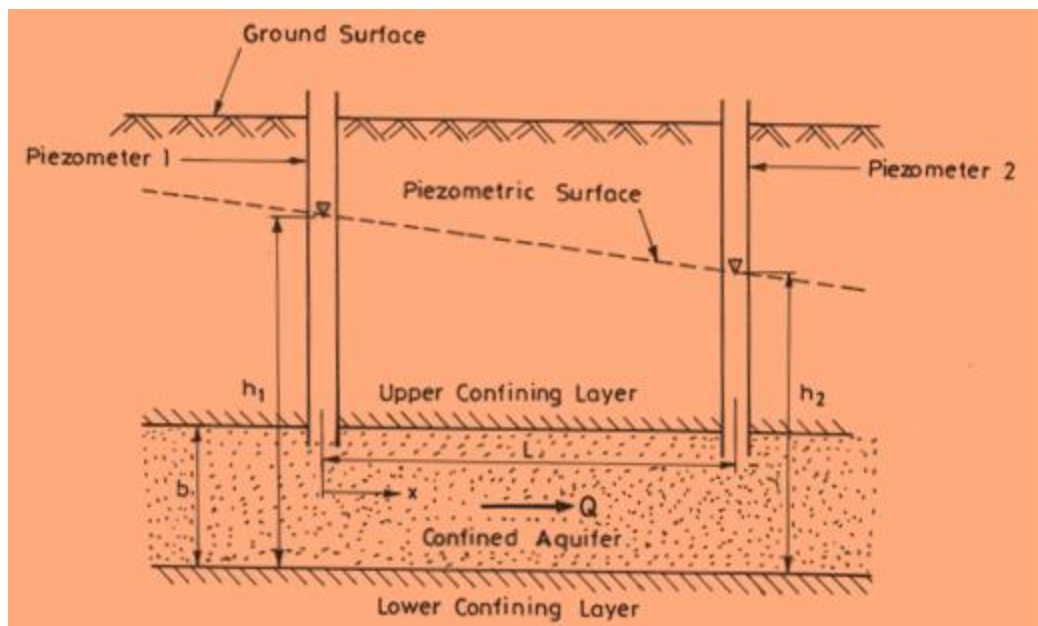
## AQUIFERS

**Aquifer** is an underground layer of water bearing permeable rock or unconsolidated materials (gravel, sand, or silt) from which groundwater can be extracted using a water well.

**Hydrogeology** is the study of water flow in aquifers and the characterization of aquifers.

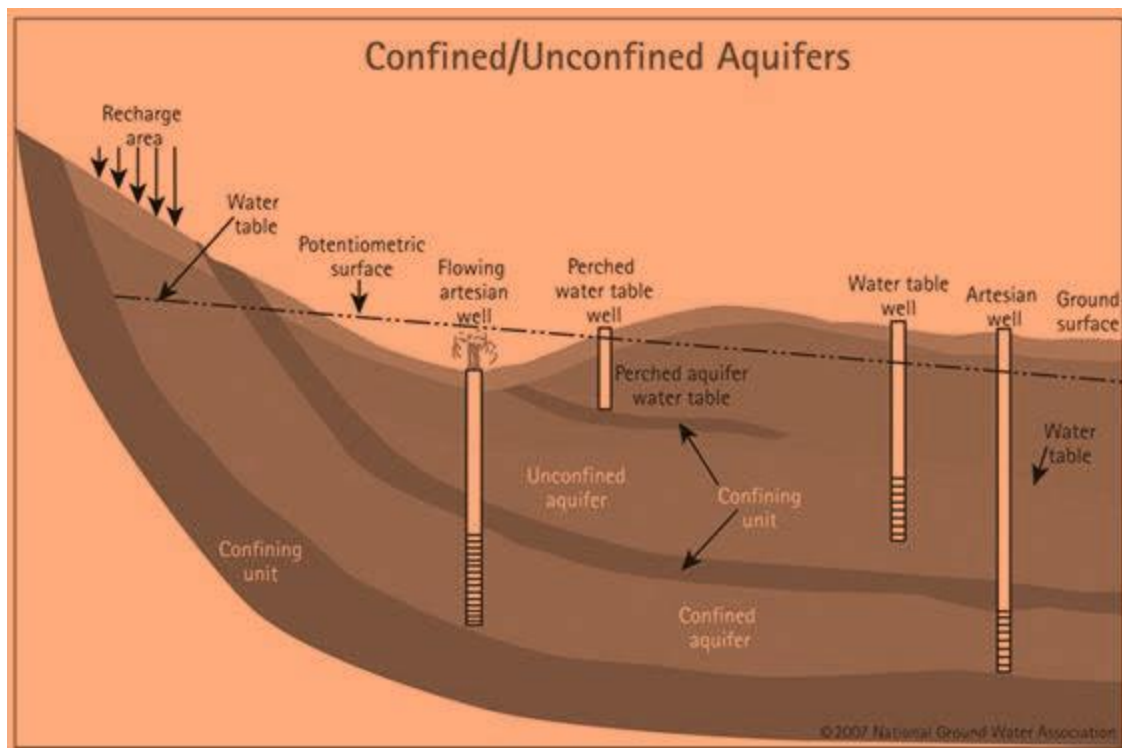
### TYPES OF AQUIFERS:

Aquifers are classified in terms of their structure, hydraulic performance, texture, lithology, and the mobility of their water. As to their structure and hydraulic behavior they can be classified into “free”, “unconfined” or “semi confined”. The same aquifer may be free, confined and semi-confined by sector and area of study.



**FREE AQUIFER** is such in which there is free shallow water in contact with air and atmospheric pressure, so that its pressure is actually equal to the atmospheric pressure. This type of aquifer does not have a layer of waterproof material above them.

An unconfined aquifer groundwater level coincides with the surface and is in direct contact with the soil under saturated zone. Its position varies depending on the rainy season or the dry season.



**Confined Aquifers** are those bodies of water that accumulate in the permeable rock and are enclosed between two impermeable layers.

## CONCEPT 1

In these aquifers water is subjected to a pressure greater than the one of the atmosphere and takes up all pores and voids of the geological formation completely saturating it. There is an “unsaturated zone”

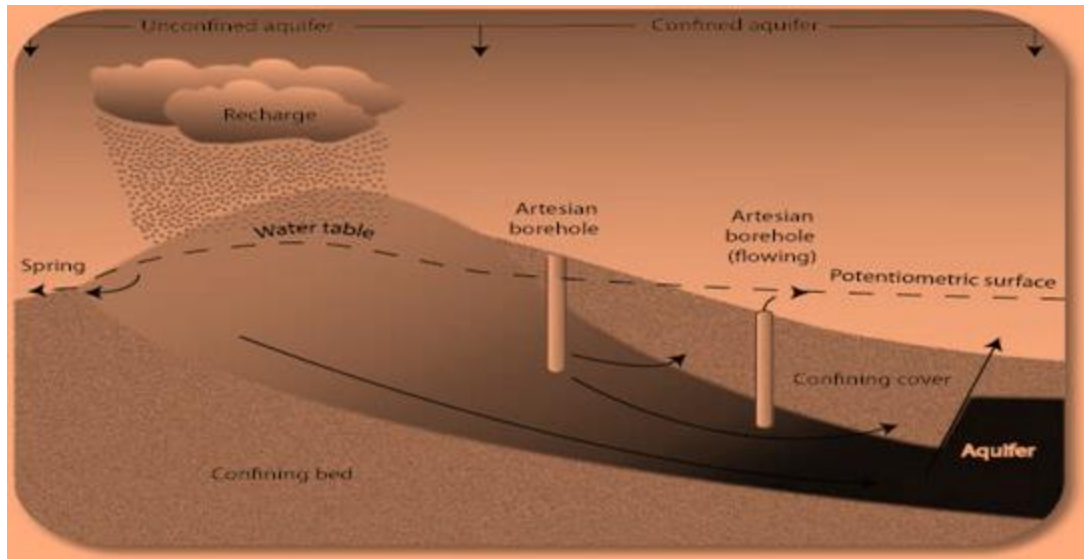
If this type of aquifer is drilled, the water level will rise to be in a position corresponding to the saturation level in the aquifer recharge area.

The water is subjected to a pressure greater than atmospheric and rainwater is received only in areas where the materials are permeable in various points generally different where the body of water lies.

A “semi-confined” aquifer occurs when the layer of soil that covers the aquifer has significantly less permeability than the aquifer itself, but is not waterproof, allowing discharge and recharge occurs through this stratum.

The wall and/or roof are not completely waterproof and allow the vertical filtration of water, so water can be recharged or lost through the roof or base.

According to the mobility of water an aquifer can be classified into “aquifer” “aquitard,” “aquicludes” among others. Water velocity depends on the porosity and percolation of the rock at a rate of 1 centimeter per year.



## CONCEPT 2

The “aquifer” store and transmit groundwater usually through porous sands and limestone.

The “aquitard” are good storage but bad transmitters, which transmit groundwater slowly (for example, compounds of silts).

The “aquicludes” are good storages but null transmitters (for instance, clays) The “acuifugos” do not store or transmit water, as those made of granite, or uncracked quartzites.

According to the lithology they are classified in “detritus” or “carbonated”.

According to the texture may be classified into “porous” and “fissure” “Porous” aquifers are those in which water is soaked as in a sponge within interconnected pores with each other.

For example, those where there is sand and gravel “Fissure” aquifers are those that the water is in cracks or joints interconnected, but the water behaves heterogeneously.

