

STUDY OF AQUIFERS

Groundwater is the underground water that occur in the saturated zone of variable thickness and depth, below the earth's surface. Cracks and pores in the existing rocks and unconsolidated crystal layers, make up a large underground reservoir, where part of precipitation is stored. The groundwater is utilized through wells and tubewells.

Groundwater Aquifers

A permeable stratum or a geological formation of a permeable material, which is capable to yield appreciable quantities of groundwater under gravity is known as an *Aquifer*. When an aquifer is overlaid by a confined bed of impervious material, then this confined bed of overburden is called an *Aquiclude*. The types of aquifers are:

(1) Unconfined Aquifer or Non-Artesian Aquifer: An unconfined aquifer is one which is not confined by an upper impermeable layer. It is also known as *water table aquifer*. Water in these aquifers is at atmospheric pressure. The upper surface of the zone of saturation is known as *water table*. When a well is constructed in these aquifers the level of the water table is the level of water in the well.

(2) Confined Aquifers or Artesian Aquifers: When an aquifer is confined on both sides by impervious rock formations *i.e.* aquicludes, and is also broadly inclined so as to expose the aquifer somewhere to the catchment area or recharge area at a higher level for the creation of sufficient hydraulic head, it is called a ***confined aquifer or an artesian aquifer***. Water in these aquifers is under pressure above atmospheric pressure. When a well is put in these aquifers water will rise to a level above the water table of the upper confining layer because of the pressure under which the water is held. The imaginary level to which water will rise in wells located in an artesian aquifer is known as the piezometric level. Should the piezometric surface lie above ground surface, a flowing (artesian) well results.

(3) Perched Aquifer: Perched aquifer occurs whenever a ground water body is separated from the main groundwater by a relatively impermeable stratum of small areal extent.

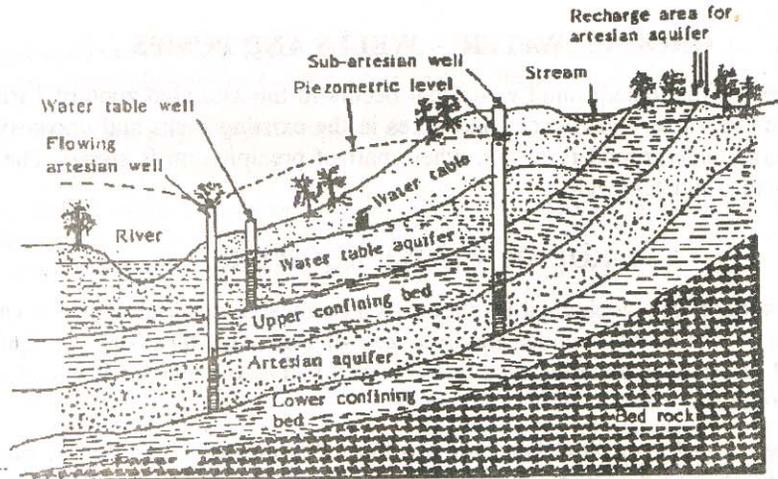
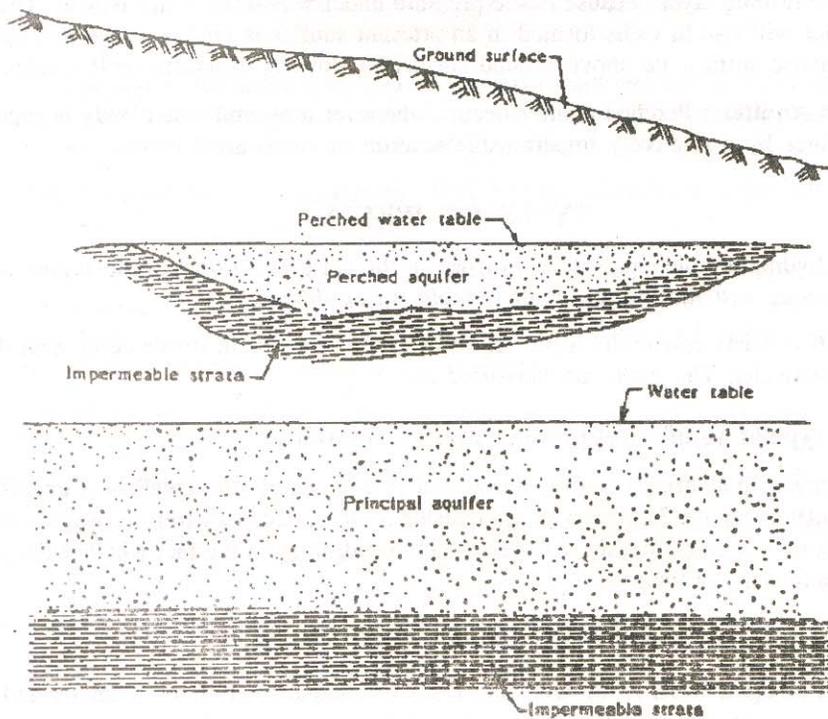


Diagram illustrating artesian and water table aquifers, water table well, flowing artesian well, sub-artesian well and potential recharge area for the artesian aquifer



Perched Water Table