

## TECHNOLOGICAL PLANNING BASICS OF DRILLING WELLS FOR WATER

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It is known that the main way to extract drinking or industrial water is to build wells (Fig. 1). Moreover, there is a general trend of constant increase in hydrogeological drilling [1].

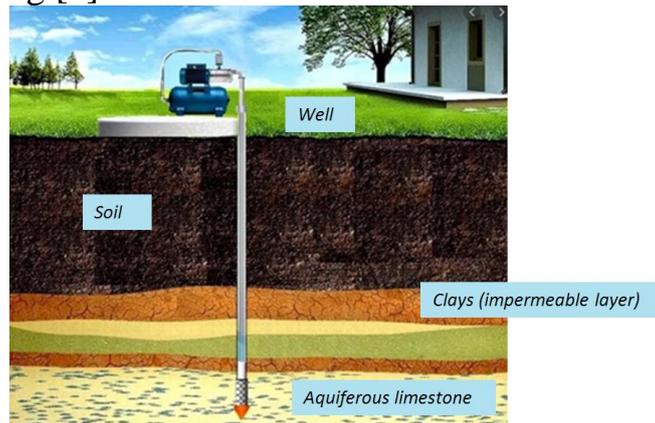


Figure 1. Position of impermeable layers (most often it is clay)

Borehole is a vertical boring to reach aquifer. In a well terminating into rock, an open borehole will extend beyond the bottom of the well casing (Fig. 2) [2].

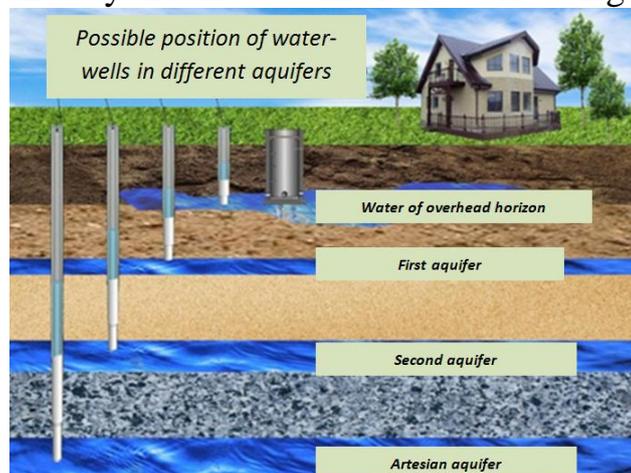


Figure 2. A location of water-wells in different aquifers

Water well is a hole excavation used for the purpose of extracting ground water from the subsurface. Water may flow to the surface naturally after excavation of the hole. Such a well is known as a flowing artesian well. More commonly, water must be pumped out of the well.

Hydrogeologic wells are equipped with filters to protect the water intake part from collapse and to purify the water entering the production string from mechanical impurities [3]. The filter consists of an over-filter part, a working part and a sump closed with a stopper from below. Depending on the depth of the well and the nature of

the aquifer, the length of the sump used to settle rock particles that have passed through the working part of the filter is from 1.5 to 10 m.

Particular attention in the development of a hydrogeological well construction project should be paid to the stage of assembling well structures and their component - the downhole filter part (designed to prevent the collapse of the water intake part of the well and purify water from mechanical inclusions), since it has a number of features due to the wide range of wells for their intended use [4].

The main requirements for filters are: maximum water throughput with good water purification; sufficient mechanical strength, corrosion resistance; ease of manufacture and low cost (Fig. 3). The productivity of a well is largely determined by the way the aquifer is tapped and the properties of the corresponding flushing fluid.

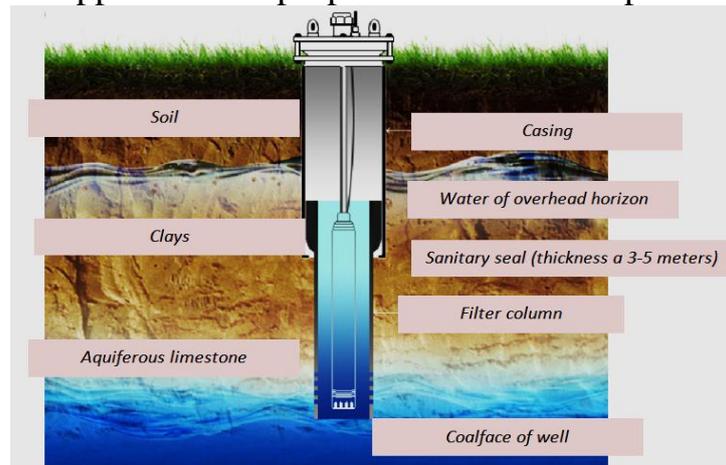


Figure 3. An order of setting water-well filter

The water throughput of the filter is characterized by the ratio of the area of the passage holes to the entire working surface of the filter (Fig. 4).

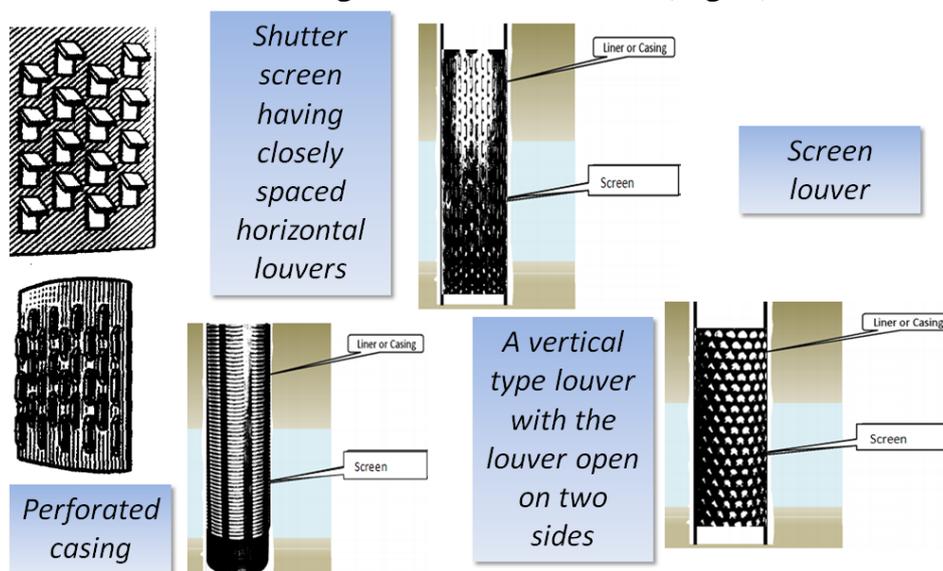


Figure 4. Types of casings for filters

The type of water intake part depends on the nature of the aquifer rocks. Supporting the sprinkling when equipping a gravel filter is one of the most critical

stages in the complex of works related to the design, construction and operation of water intake wells.

### **References**

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4. Ihnatov, A. (2021). Analyzing mechanics of rock breaking under conditions of hydromechanical drilling. *Mining of Mineral Deposits*, 15(3), 122-129.