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RESEARCH ON METHODS OF REDUCING THE LEVEL OF GROUNDWATER

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Abstract
In the article, one of the methods of combating seepage water lying in small depths is presented. In areas occupied by agricultural crops, one of these methods is to dig drainage wells in relatively deep aquifers, through which the seepage waters flow to the lower layers. Here, the protection of fresh drinking water horizons that may exist in interlayers is an actual problem. For these purposes, optimal constructions of dug drainage wells have been developed and they protect drinking water layers from underground seepage.

Keywords: Well, water, layer, sand, flow, rock, pressure, melioration, mud, gut, moisture, aggressive, experience, result, method, option, quality, pump.

Introduction

The development of irrigated agriculture leads to an increase in the level of seepage water in places, and this situation causes the following negative situations:

— partial occupation of fertile lands with ditches dug to lower the level of flood waters;
— decrease in land productivity;
— salinization of lands and spreading of sediments;
— changing the chemical composition of underground waters and deteriorating their quality;
— deterioration of land reclamation conditions and the emergence of several such undesirable factors.

Solving this problem began in the first half of the last century and continues today. It is known that in some sectors of mining and oil and gas production, one of the main problems of today's environment is the elimination of aggressive formation waters with high salinity, which are mined together with oil, during the drying of ore rocks, and this issue has been successfully solved in the field. done For example, to solve this problem, low-pressure aquifers are found in the geological cutting of oil and gas fields, and aggressive brines extracted from them during oil and gas treatment are pumped into the aquifers through idle wells.

The Main Part

In this case, if the pressure of the water-pumping layer is greater than the hydrostatic pressure, the saline water is pumped into the layer using a pump, otherwise, the water flows through the wells into the water-absorbing layer with its own flow [1]. In the mining industry, in the open mining of ores in solid mineral deposits, the ore layers are often flooded. After the ores are mined, they must be dried on-site before being shipped to the consumer. This event is organizationally and technically complex, requires a lot of money and time, and ultimately

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leads to an increase in the cost of the product. Until recently, the groundwater in the body of the ore body was pumped up to the surface of the earth through a drainage well to the lower level of the ore layer. This method was used in the Sangaredi bauxite mine in the Republic of Guinea.

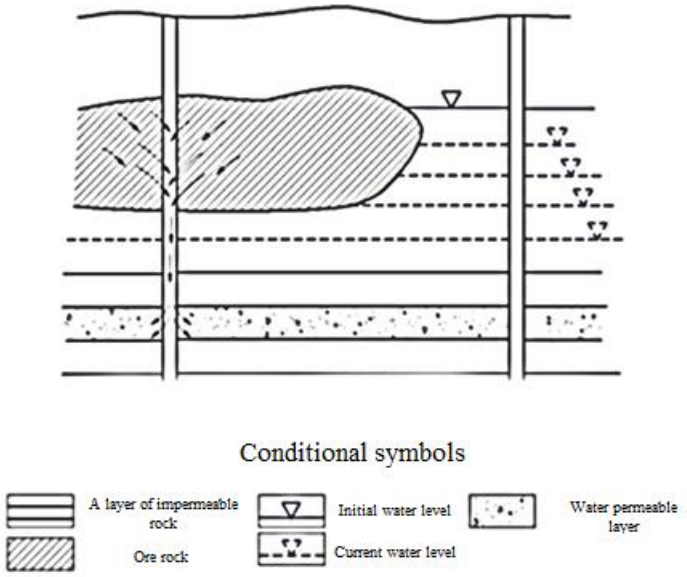

Figure 1. Drying ore rocks underground.

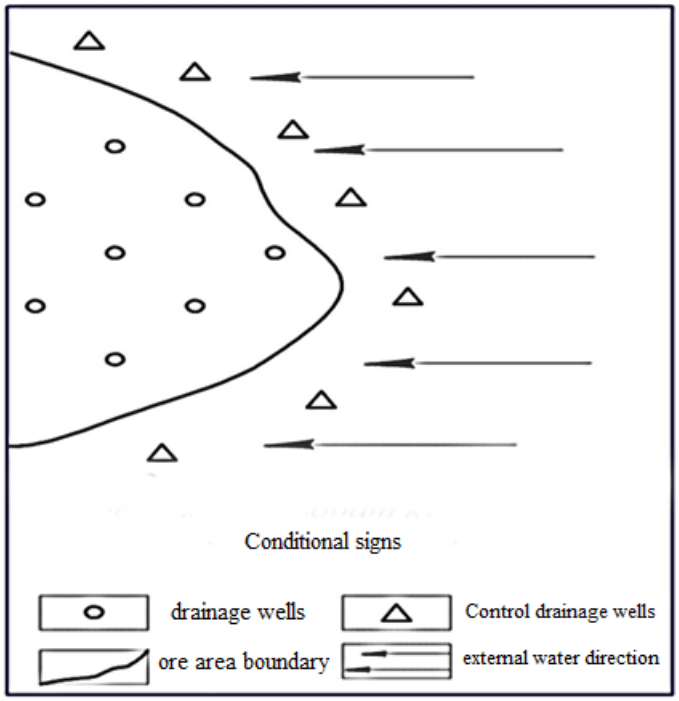

Figure 2. Placement of drainage and control wells in the drying of ore deposits.

As a result of the geophysical research conducted by us in 2008-2017, it was found that there are permeable layers in the lower part of the mine's geological cutting. As a result of the

conducted hydrodynamic studies (experimentally pumping water into four deep wells), the water absorption properties of these layers were studied and determined. Experiments have shown that the pumped water in all wells was absorbed in the bottom of the well under its hydrostatic pressure (Fig. Based on our recommendations, the bottom of the drying wells dug in the mining areas of the mine was deepened from 70-80 meters to 130-150 meters, and new wells were dug for these works. As a result, the hydration level of ore mined in the areas where these works were carried out and the relative consumption of fuel used for its drying decreased [2]. The obtained positive results require the use of this method in the agricultural sector to reduce the level of stormwater.

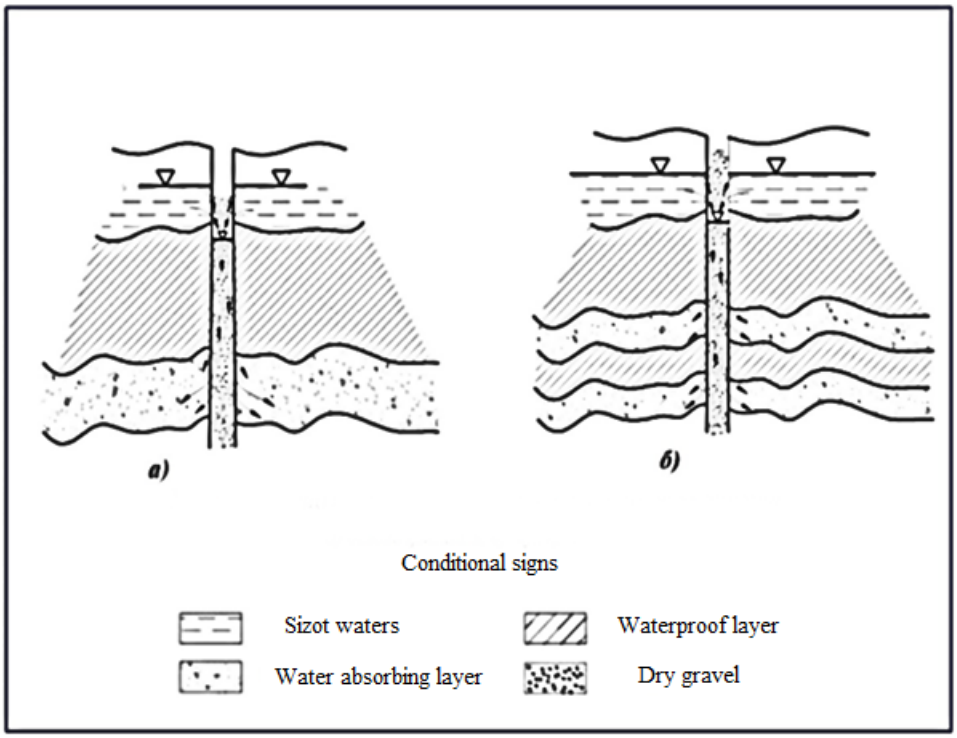

Figure 3. Drainage of water down through drainage Wells.

The lower part of the irrigated lands of the Fergana region is lithologically composed of gravel-sand and clay-sand-gravel rocks that have different collector properties in relation to water. The upper part of the geological shear consists of sandy, sandy gravels, and when it deepens, the content of the sand fraction in the soil decreases and is replaced by clay (rich) and gypsum rocks. The latter is impermeable due to the very small size of particle diameter (0.01-0.001 mm) and plays the role of a "screen", which causes the groundwater level to rise during the irrigation season. Beneath these impermeable layers lie layers of water-absorbing sand and gravel in the same order. It is these layers that can be the collectors of underground water, and the water from above can be pumped into them.

The water absorption ability of the lower permeable layers, which depends on the hydrostatic pressure, also plays an important role here. There are several theoretical conditions for lowering the level of aquifers by pumping them into the sedimentary layers. If the hydrostatic pressure of the groundwater above is greater than that of the lower layer, then the water flows from the

first to the second under its pressure. Otherwise, it is necessary to use pumping units to drain the seepage water to the lower layers. Here, taking into account the geological structure of the place, it is possible to apply different combinations of pumping of seepage to the lower layers. The selected options should primarily be aimed at protecting clean drinking water bodies from pollution.

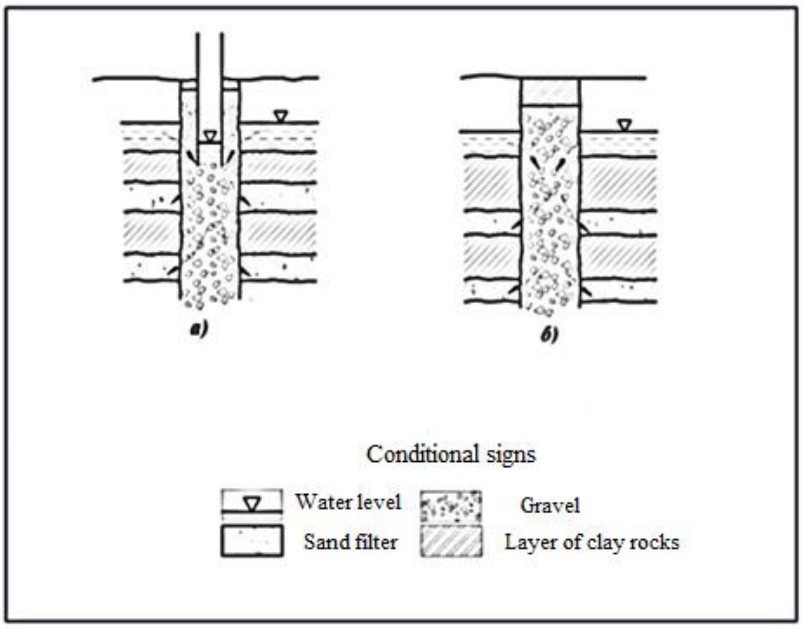

Figure 4. Drywall drainage Wells bottom.

Conclusion

It should be noted that in the Southern regions of the Fergana region, the layer of gravel rocks with good collector properties lies at small depths, which creates favourable practical conditions for driving the upper seepage waters to the lower layers. Based on the above-mentioned points, we believe that it is appropriate to carry out scientific and research works by drilling drainage wells in separate experimental areas to reduce the level of seepage water on the ground. This, of course, allows us to eliminate the negative events given at the beginning of the text.

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