Designing the use of solar panels to operate water pumps in groundwater use

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Abstract: *In this article, regions, underground, artesian basin, resource, hydrogeological works in arid regions of Uzbekistan, rational use and effectiveness of underground water collectors, monitoring. Issues of their protection are organized and analyzed.*

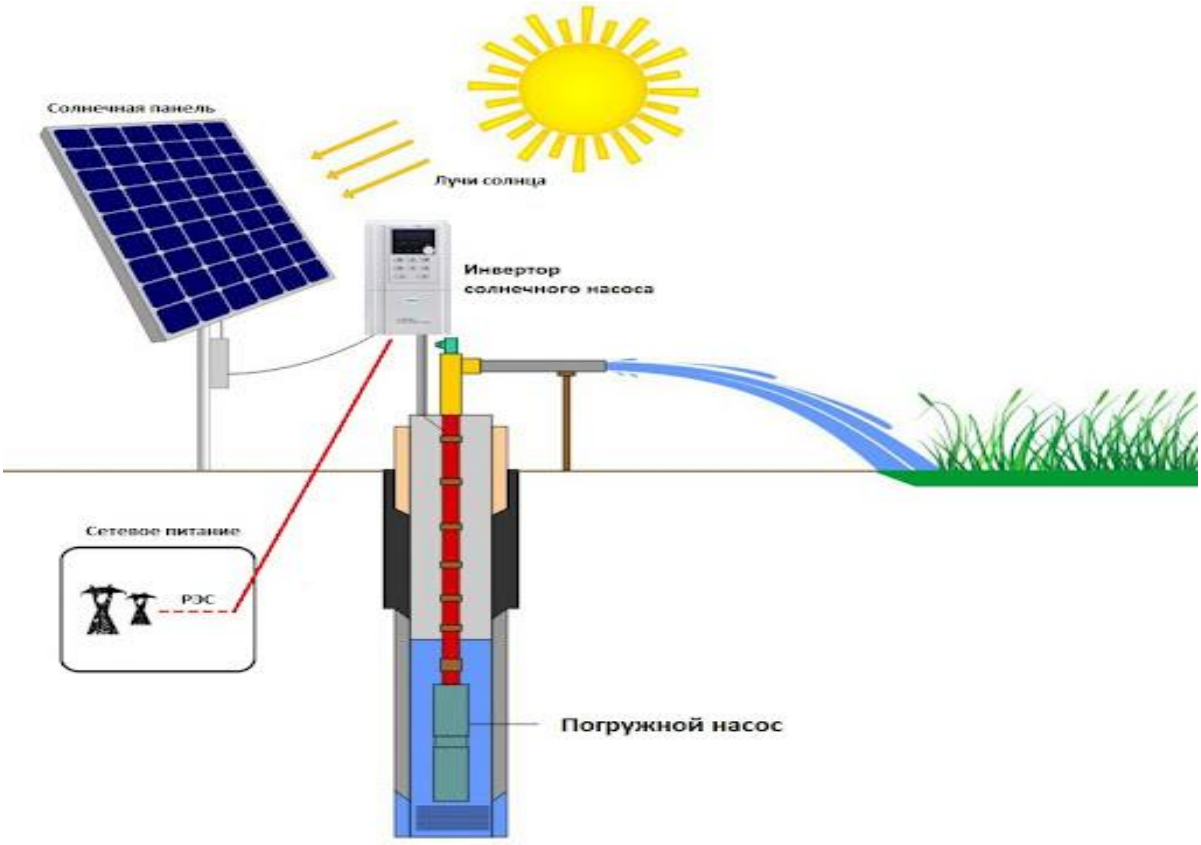
Key words: *underground water, hydrogeology, types of underground water: condensation, juvenile, sedimentogenic, syngenetic, epigenetic, impermeable layer, pressurized water, artesian water.*

Waters found below the surface of the earth, in the cavities and crevices of rocks, are called underground waters. Such waters are widespread among the layers of the earth and are important in the development of the national economy, in the provision of water to the population, cities and villages, in the construction of hydrotechnical and industrial facilities, in irrigation works, in spas and sanatoriums and in other areas. Underground The geological work of its waters is extremely diverse. They dissolve minerals and carbonate rocks between rocks, wash sand rocks and form caves. The science of hydrogeology deals with the appearance, distribution, movement, quantity, and quality of underground water. As a result of scientific research carried out in recent years, it has been determined that 70% of atmospheric precipitation flows into the sea, about 25% evaporates, and more than 5% seeps underground. The emergence of underground water. The water between the rocks is formed by the partial seepage of precipitation between the sand and

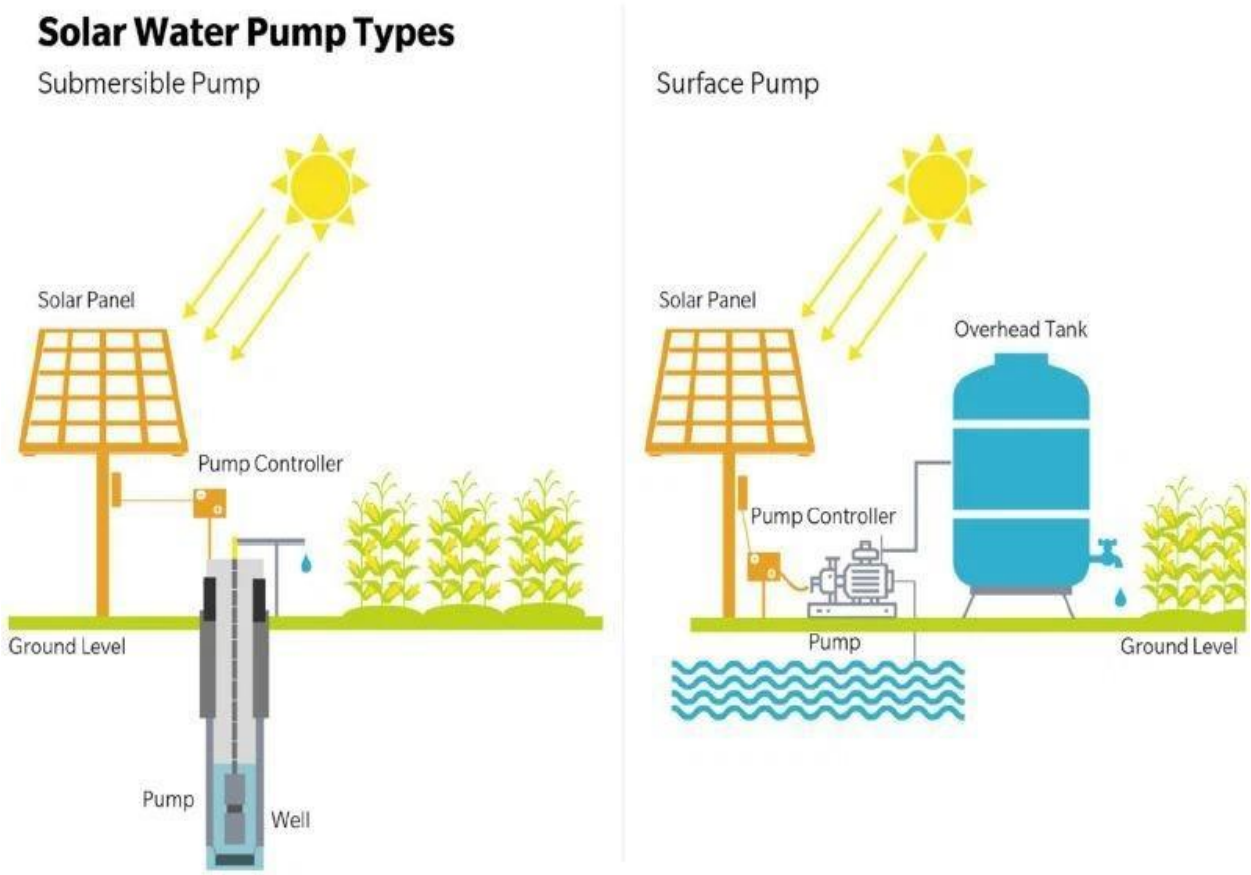
stones over the ground, that is, by infiltration. For example, every year in Uzbekistan, 8 billion m3 of water is absorbed from the irrigation system in addition to the atmospheric water and added to the groundwater. Secondly, mineral water also appears in the process of condensation of water vapor. At this time, the water vapor in the ground cools down and turns into water. Water vapor is widely distributed in the rocks, which increases their elasticity, due to the high pressure of the soil, the vapor rises again into the air. So, the condensation process brings water vapor into the soil and removes it from it. Water vapor condenses the most in mountainous areas, steppes, and permafrost regions.

Currently, the water in the rocks is divided into the following types.

1. Waters in the form of steam.
2. Physically bound waters: hygroscopic and filmy waters.
3. Free waters: capillary and gravitational waters.
4. Solid state (ice) waters.



Groundwater is always in motion and slowly flows from the feeding regions to the places of consumption according to the laws of gravity. Their movement has the character of filtration (seepage) through water-permeable rocks. Usually, erosion waters move parallel to each other along the pores and cracks that are not wide. Such movement is called laminar movement. Sometimes, when erostic waters move through karst spaces, their movement can be as turbulent as river currents. In sandy rocks, the speed of erosive waters is from 0.5 to 12 m/day, in gravel and cobblestones it is 20- 30 m/day, and in karstified limestones it can increase to 100 m/day. Groundwater drainage (drainage) takes place in natural conditions in the form of springs and fountains. Usually, they are located in river valleys, ravines, on the shores of lakes and seas, in other depressions of the terrain. Tashkent mineral water erupts due to pressure from Cretaceous sands (from a depth of 1800-1850 m) forming a synclinal structure. composition. Waters in nature, including mineral waters, have extremely strong solubility properties. Before the rain falls on the ground, it mixes with dust and gases and changes its composition. Part of the flowing water begins to seep under the layers of the earth and, passing through rocks of different composition, partially melts them and changes its composition. The composition of mineral water is influenced by the composition of deposits, their depth, the state of lying and other factors. Waters that have a physiological effect on the human body and are biologically active and used for therapeutic purposes are called mineral waters. The mineral and gas-saturated waters of Erosti reservoirs are generally considered to be healing. But not all mineral waters of Erosty are suitable for treatment. The mineral elements necessary for treatment are not in the same amount in the composition of mineral water, some have more, some have less. Mineral waters contain iron, magnesium, radium, bromine, iodine and some gas. Mineral waters are not only based on their content, but also based on their temperature



The temperature of mineral waters is cold (up to 20°C), warm (from 20 to 37°C), hot (from 37 to 42°C) and very hot (hypothermal - above 42°C). Mineral waters are mostly found in Yosh mountains and volcanic regions. They come to the surface in the form of springs and fountains. Mineral waters are related to the earth cracks created as a result of tectonic movement and the change, mixing and pressure of substances there. YOSH Mountainous countries, for example, the Caucasus, Pamir Mountains, Kamchatka and Kuril Islands, Uzbekistan also have a lot of mineral water. Currently, such mineral waters are widely used in medicine and industry. Carbonic anhydrite, hydrogen sulfide, and radioactive mineral waters are distinguished by their composition, properties, and therapeutic value. Strongly

carbonated waters with carbonate anhydrite are widespread in the Caucasus. These are the waters of Kislovodsk and Zheleznovodsk Narzans, Borjomi in Georgia and Jermuk in Armenia. In Europe, the waters of the spas of Vichy, France and Karlova Vary, Czech Republic are considered healing. Hydrogen sulphide mineral waters are rich in free hydrogen sulphide. They are found in Sochi (Matsesta), Dagestan (Talgi), Latvia (Kemeri), Orolboyi (Ust-Kachki), Tajikistan (Obishifo) and other places. Hydrogen sulphide waters have developed in the current regions of Volcanism. Radioactive waters are enriched with radioactive elements, primarily radium emanation - radon. Radon waters are widely used for therapeutic purposes in the resorts of Shaltubo in Georgia and Belokurikha in Altai.

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