UNDERGROUND WATERS OF KASHKADARYA AND SURKHANDARYA OIL AND GAS-BEARINGARTESIAN POOLS

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ABSTRACT

This paper makes analyses of the underground waters of kashkadarya and surkhandarya oil and gas-bearingartesian pools. It makes analyses on both theoretical and methodological bases. Finally, it concludes with both outcomes and shortcomings as the whole.

Keywords: underground, waters, kashkadarya , surkhandarya, oil , gas-bearing, artesian pools

INTRODUCTION

Hydrogeological conditions are among the most important factors determining the geotechnical features of the territory. The nature of groundwater distribution, the depth of their occurrence, mode, water availability, chemical composition and aggressiveness - determine the features of surveys, design, construction and operation of structures. All of the above parameters are closely related to both geological and geomorphological and climatic features of the region.

The hydrogeological conditions of the region were studied by S.A. Bakiev, L.S. Balashov, E.A. Bars, E.A. Baskov, B.A. Beder, K.G. Brovin, R.I. Goldstein, P.P. Ivanchuk, Yu.I. Irgashev, L.A. Kalabugin, N.A. Kenesarin, V.N. Kortsenstein, V.A. Kudryakov, I.V. Kushnirov, S.Sh. Mirzaev, L.I. Mikhailov, K.Ya. Oprishko, K.P. Pulatov, V.G. Samoilenko, A.N. Sultanhodzhaev, V.M. Tarasov, S.T.Tolipov, A.S. Khasanov, N.N. Khojibaev, N.M. Churshina and many other researchers.

It is worth noting that most of the hydrogeological studies within the studied region were carried out in small areas, while the tasks were local in nature, in particular, the possibilities of water supply of some industrial facilities, settlements, livestock farms due to groundwater were identified, and work was carried out on determination of the reserve and balance of groundwater. The works reflecting the influence of groundwater on the formation of oil and gas deposits, engineering and geological conditions, in particular on the change in the filtration-capacitive and physico-mechanical properties of various deposits, on the formation of geological processes and phenomena are rather insignificant, and are almost not considered for certain territories of the region.

Sherabad-Surkhandarya and Kashkadarya second-order artesian basins are located within South-West Uzbekistan. The sections of the basins as a whole differ from each other. The main differences are in their size, in the depth of the foundation in them. The conditions determining the formation of groundwater in the region are influenced by factors determining the direction of the hydrogeological process (geological structure, topography, climate, hydrogeographic network), and human activity, which partially changes the distribution of surface water runoff. Due to the uneven distribution over the seasons of the year, precipitation can play a significant role in the supply of groundwater only in the winter-spring period.

The regional area for the formation of groundwater is the territory of the Zirabulak-Ziaetda, Karatyubinsk, Gissar, Babatag, Tuyuntag, and Baysun mountain systems. The atmospheric precipitation that infiltrates here, passing through tectonic cracks, weathering and bedding cracks, in the highlands, to the highlands and to the highlands foothills, foothill plains, intermontane basins under high hydrostatic pressure move from a higher elevation (1200-4500 m) to a lower elevation. The formed groundwater flow is unloaded in river valley gorges, on slopes in the form of springs and is involved in the formation of the region's

hydrogeography (Irgashev [1, 2, 3]). Part of the waters, moving west, replenishes the Sherabad-Surkhandarya and Kashkadarya artesian basins. The hydrogeological conditions of these basins were studied in more detail during complex hydrogeological and engineering-geological surveys of a scale of 1: 200000 (1960-1984).

A.N. Sultanhodzhaevi et al. [4] indicate that the Kashkadarya and Sherabad Surkhandarya artesian basins are a large megasyncline, complicated by a number of positive, and mainly brachianticinal, structures. These pools are characterized by a three-story hydrogeological structure. The first (upper) hydrogeological floor combines the horizons of Neogene and Quaternary sediments, the second (middle) - Mesozoic and Paleogene; the third (lower) - Paleozoic.

As you know, for the purposes of industrial, civil, road, irrigation, land reclamation and other types of construction, in the vast majority of cases, groundwater of the upper hydrogeological complex, especially groundwater, is of great importance. In this regard, the greatest attention is paid to the characteristics of groundwater contained in deposits of the Upper Pliocene-Quaternary complex.

The lower hydrogeological floor, represented by the Paleozoic aquifer, is exposed in the Zirabulak – Ziaetdin, Karatyub, Gissar and Babatage ridges, and is also opened by deep wells at a depth of 2800 m — within the Kashkadarya and, at a depth of 3000 m — Surkhandarya basins.

Sources wedged out of these deposits are characterized by low temperature, very low salinity, and predominantly hydrocarbonate-calcium-magnesium composition. All these features are characteristic of the feeding zone, and, therefore, the shallow circulation zone, as a rule, in well-washed rocks. Penetrating into deeper cracks, stretching over long distances, desalinated cold water is heated, while the solubility increases.

The degree and nature of the Paleozoic rocks aquifer certainly remains within the lodge of the Surkhandarya and Kashkadarya artesian basins [4]. waters to great depths.

The second hydrogeological floor is confined to the aquifers of the Jurassic, Cretaceous and Paleogeneor5[ ]. Its power varies from 500 to 5-8 thousand meters. In the second hydrogeological floor, which was discovered in many structures of the region, up to six aquifers are distinguished: 1) Permo-Triassic enclosed in metamorphosed rocks; 2) Lower-Middle Jurassic terrigenous, with a thickness of more than 1000 m; 3) Upper Jurassic carbonate-terrigenous, with a thickness of up to 4000m; 4) Neocomian-Aptian-terrigenous, with a thickness of 200 to 2000 m; 5) Alb-Cenomanian terrigenous, with a thickness of 200-500m; 6) Turonian-Paleocene terrigenous-carbonate, 100-200 m thick. The isolation of the complexes is ensured by the following water-resistant strata characterized by relatively regional distribution: Upper Jurassic (halogen), Lower Albian, Lower Turonian (pelitic) [5].

In the marginal parts of the basin, in some cases also central, clayey water-resistant deposits turn into coarser-grained permeable or eroded, which causes a hydraulic connection between the distinguished aquifers. Deep regional faults and salt tectonics can be of considerable importance in this. According to tests, at a depth of 2600 m, the salinity of the Jurassic deposits varies from 100 to 500 g / l and are sodium chloride by the nature of the mineralization.

On the southern slope of the Gissar Range, springs pinching out of gravelites, sandstones and limestones are found at an altitude of 2400-1480 m, the waters of which are fresh with mineralization up to 0.45 g / l, hydrocarbonate-calcium-magnesium composition, cold - from 8 to 18 ° C.

Cretaceous deposits are widespread within the Kashkadarya and Surkhandarya artesian basins; more than five pressure, often self-flowing aquifers associated with strata of sand, sandstone, conglomerate, and limestone[6] are associated with them; they are discovered at depths from 615 to 885 m in Kashkad andfrom 397 to 659 m - in the Surkhandarya basins. Pressure water, piezometric levels are established from the surface

of the earth from +72.5 (upper horizon) to +84.6 m (lower). The water is terminal, costs are from 0.3 to 2.0 l / s, slightly salted, its dense residual content is from 43 to 1.5 g / l. The nature of mineralization is hydrocarbonate-sodium.

In Paleogene sediments, water is developed in the strata of limestone, sandstone, and siltstone, reaching the day surface along the slopes framing the basin, mountainous areas, as well as in diffuse areas of positive structures. These areas are the main areas of water supply for Paleogene sediments. Within the Kashkadarya basin, the Paleogene waters are close in physical and chemical properties to the waters of the Cretaceous deposits. However, water with high salinity or brines are not found in the Paleogene sediments, the salinity in them usually does not exceed 1.5-3 g / l, in some areas up to 10-30 g / l. The chemical composition of water from feeding areas to submerged areas varies from sodium bicarbonate to sulphate-chloride and sodium-calcium. The aquifer is opened at a depth of 150-200m, thickness - 50-120m. The subthermal waters (25-30 ° C), in most cases (the western part of the region) are self-draining. The piezometric level in the western part of the basin is set above the earth's surface at 5-7 m, within the northern and central parts - at a depth of 5-6 m.

The upper aquifer with a capacity of 400 to 1500 m is widespread in the basins. It contains mainly reservoir pressure water in the lower part and groundwater in the upper one.

Deposits of the Paleogene sequence (Eocene-Oligocene), delimiting the sphere of difficult water exchange, which includes two lower hydrogeological floors, from the sphere of free water exchange, including the upper floor □ 5□ , appear as a general regional catchment of the basin.

Groundwater sediments of the Upper Neogene within the Kashkadarya basin are widespread. Water-bearing rocks - sands and variegated sandstones. The depth of the aquifer is 30-175 m, the thickness is 170-370 m. The piezometric water level of the lower aquifers in the eastern part of the region is higher than the surface and, as a rule, the wells give a spill. As you move westward, the groundwater pressure of the lower horizons decreases. So in the region of Karshi and Kasan, the piezometric level is set at almost the same level as the level of the groundwater itself, and to the west of this band in the region of the cities of Mubarek, Karaulbazar, Buzachi and others it is 2-6 meters hypsometrically below the level of the groundwater water; in the region of Nishan, to the south and south-west of it, the value is 1.0-0.8 m, the specific production rate of wells drilled on the aquifers of Neogene-Quaternary sediments (up to 100-150 m), depending on the thickness and The lithology of the aquifer varies between 0.3-3.5 l / s□ 2□ .

Within the Surkhandarya artesian basin, Paleogene sediments are exposed along the periphery of the basin and form synclinal cores, wings and arches of anticlinal structures. A significant amount of fresh and mineral springs are confined to the exposed part of the Paleogene sediments. This is especially characteristic of the Alai and Bukhara layers. On the dive, the roof of the Buljuan Formation of the Upper Oligocene – Lower Homocene opens at depths of 96–960 m. The lithological complex is represented by sandstones, siltstones, clays, marls, gypsums, and limestones. The total thickness of the Paleogene deposits varies from 450 to 748 m. The Glinisuzak layers are a regional water-resistant layer that separates the aquiferous deposits of the Alai layers from the underlying aquifer of the Paleocene sediments. □ 3□ .

Groundwater, confined to the Alai and Bukhara sediments, is pressurized. Sulphate-chloride sodium-calcium compositions, medium-mineralized, with a total hydrogen sulfide content of 1394 mg / l, with the presence of carbon dioxide, boron and bromine, flow rate - 17 l / s.

Neogene deposits have a significant distribution within the Surkhandarya artesian basin. Numerous sources on the wallpaper on the sides of the basin in the rocks of the Upper and Lower Neogene □ 2□ are associated with these sediments. The chemical composition of the water is mainly hydrocarbonate, magnesium-

calcium with a salinity of 0.3-0.6 g / l. The composition of the waters and their relatively low salinity are due to the close feeding area.

In the river valleys and on their sides, the aquifer is blocked by aquifers and Quaternary sediment horizons. The roof of the complex is opened at a depth of 165 m. At the beginning, the aquifer complex of the Polizak (with a thickness of 500-600 m), then the Karanak (with a thickness of 400-900 m) and the subsequent Hhingaut-Tavildara suite (with a thickness of 800-1200 m) are opened. The total thickness of the Neogene is 1700-2700 m. The aquifer is characterized by the distribution of pore-fissured water and contains pressureless water in the near-surface part and pressure water in the deep parts. The water mobility of the sediments of the aquifer is low. The flow rates of the springs amount to hundredths of an ideal thousandths l / s. The mineralization value ranges from 0.32 to 1.4 g / l. According to the chemical composition of the water, hydrocarbonate-sodium-magnesium. The area of nutrition of the aquifer is the outcrops of water-bearing rocks to the surface, and atmospheric precipitation is the source of nutrition.

Underground water in the Quaternary sediments is confined to rocks of various age and genesis. The partition of these waters is based on the general regional conditions for their distribution and the nature of their occurrence, as well as their confinement to certain lithological-stratigraphic and genetic types of rocks. This made it possible to identify a number of aquifers that occupy different positions in the section and are characterized by specific features.

Groundwater of the Middle Quaternary and Upper Quaternary proluvial sediments of the Ilyak, Karnab and Shorkuduk complexes is developed within the proluvial wavy strongly dissected and flat plains, occupy the eastern half (foothill plains) of the Kashkadarya and Surkhandarya artesian basseyn. Underground waters are confined to loess-like sandy loam, loam and form a single aquifer with a general direction from east to west. The slope of the surface of the groundwater mirror is on average 0.0023.

The depth of the underground waters of the horizon, on the greater part of the plain, ranges from 5-10 to 30-40 m; on foothill adyrs of the Babatagdo ridge 70-80 m. Their mineralization can vary from 5 to 24 g / l, in most areas where intensive irrigation of lands is carried out, it does not exceed 3-7 g / l (within Karshi, Uchkizil, Leninuly, etc.). The waters are mainly calcium sulphate. According to experimental and cluster pumping performed by us in a water-containing loesslike sandy loam, the described aquifer is characterized by relatively low filtration properties (on average, the filter coefficient

The high groundwater level (1-3 m) coincides with the period of maximum river discharge, but with a 1-1.5 month delay in the locations of observation points, which are observed in July-August. The highest standing level occurs in March-April. The seasonal amplitude of the groundwater level drops downstream from 5-7 to 1.0 m, but on average the area does not exceed 2-4 m. The rate of rise of the groundwater level varies from 0.3-0.4 to 0. 7-1.1 m per month, depending on the intensity of nutrition, which is affected by the water content of the year, the duration of the seasonal rise, which usually lasts 2-3 months (from April-May to July-August). The decrease in level occurs relatively slowly - 0.2-0.3 m per month.

CONCLUSIONS

1. The conditions of formation, distribution, nutrition, and the depth of the underground waters of the considered basins mainly depend on the structural and tectonic position of geostructural elements, the layering and morphological features of the relief, as well as the climatic features of the territory.

2. The lithological composition of water-bearing rocks is characterized by incontinence and great diversity, both in vertical section and in distribution area. In the sediments of a number of formations and geological and genetic complexes containing groundwater, especially in loess rocks, there are large quantities of

water-soluble salts, which determine their chemical composition.

3. As the aquifers and complexes sink from the mountains to the lowlands, i.e. from the feeding area to the discharge area, groundwater mineralization naturally increases. Therefore, the chemical composition of water also changes from hydrocarbonate to sulfate and chloride with a mixed composition of cations.

4. The depth of groundwater naturally decreases from the foothills to the flat areas. The deep occurrence of the level (50 m or more) in the foothills is associated with a deep dissection (up to 80-100 more) of the relief with a ravine network. As you approach the flat spaces, groundwater approaches the surface of the earth.

5. The groundwater regime in the mountainous parts of the region changes mainly depending on the amount of precipitation, and in platform, foothill, and intermountain depressions depending on the flow of surface watercourses, the nature of irrigation, and human engineering activities.

6. Underground waters, confined to various genetic types of rocks, play a large role in the formation of Quaternary sediments, changes in their engineering and geological properties and are the main cause of landslides, karst, suffusion, quicksand, subsidence in loesses, waterlogging, flooding and salinization of soils. In this regard, the influence of these waters, as one of the factors determining the engineering and geological conditions of the area, will not be the same in latitudinal terms, they should be taken into account when assessing the hydrogeological and engineering-geological conditions of South-West Uzbekistan.

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