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CHANGE OF HYDROGEOLOGICAL CONDITIONS OF GOLODNOSTEP REGION IN CONNECTION WITH VIOLATION OF THE NATURAL PRODUCTS OF WATER SUPPLY

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Abstract
Currently, in the zone of active of active influence of the Aydarkul-Tuzkan-Arnasai man-made object are the Dustlik, Central and Piedmont groundwater deposits. A man-made object can indirectly affect the hydrodynamic, hydrogeochemical conditions the Nizhnesanzar, Ravat, Zaamin deposits of groundwater and the process of formation of groundwater in mountain rances framing the Golodnostepsky region from the sounth.

Keywords: technogenic factor, lake system, water resources, nitrogen, waste water, water intake, wells, water pollution.

Аннотация
В настоящее время в зоне активного влияния Айдаркуль-Тузкан-Арнасайского техногенного объекта являются Дустликское, Центральное и Предгорное месторождения подземных вод. Техногенный объект косвенно может влиять на гидродинамические, гидрогеохимические условия на Нижнесанзарском, Раватском, Зааминском месторождениях подземных вод и процесс формирования подземных вод горных массивов, обрамляющих Голодностепский регион с юга.

Ключевые слова: техногенный фактор, озерная система, водные ресурсы, сбросные воды, водозабор, скважина, загрязнение вод.

Introduction

Modern hydrogeological conditions of the Golod Steppe and adjacent territories were formed by the interaction of natural and technogenic factors. In the hydrogeological systems of the Golod Steppe (mountains, foothill plains, alluvial fans of small rivers), as a result of the natural process of active (climatic, hydrological) water exchange, there is a renewal of groundwater resources of promising

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deposits that are of great practical importance in the domestic and drinking water supply of the population of the Jizzakh region.

However, recently there has been a change in hydrogeological conditions in hydrogeological systems under the influence of technogenic factors (agricultural, industrial and domestic), resulting from intensive human activity. Major changes in the hydrogeological conditions of the territory (with a change in the nature and type of water exchange) occur as a result of the regulation and redistribution of water resources of the Syrdarya river basin and intensive hydro-reclamation works (increase in the amount of collector-drainage water, etc.) on the territory of the object - as the Aydarkul-Tuzkan-Arnasay lake system. As a result, a disturbed system of natural (technogenic) water circulation was formed here in the southern part of the Golod Steppe.

There are three zones of coverage of the water cycle.

a) Coverage zone of the climatic water cycle (here, the climatic type of water exchange mainly dominates).

b) The coverage area of the hydrological-technogenic water cycle (a new, hitherto unexplored hydrological-technogenic type of water exchange appears here).

c) The coverage area of the hydrogeological water cycle (here, the hydrogeological-climatic type of water exchange mainly dominates) [1-4].

As a result of the research, it was established that the Aydarkul-Tuzkan-Arnasai technogenic object, exerting a technogenic load on the hydrogeological conditions of the southern part of the Golod Steppe, creating backwater, blocked all ways of discharging modern Quaternary deposits. A new type of water exchange has been formed here, conventionally called the hydrological-technogenic type. For a complete study of this new phenomenon for the territory of the Golod Steppe, it is necessary to set up complex meteorological, hydrological, hydrogeological, hydrogeochemical and environmental studies in order to assess this major technogenic factor on the environment.

Until 1960, as was noted in [4], the Aydarkul, Arnasay depression, Lake Tuzkan were a historical place for the discharge of groundwater from aquifers and the accumulation of return collector-drainage water in the Golod Steppe region. The surface of the depression was covered with a layer of salt 20-30 cm thick. The composition of the salt is sodium, 23.6-27.8% sulfate, 22.5-26.9% chloride. After the noted events that took place in the late 60s, by the beginning of the 90s, the Aydarkul-Tuzkan-Arnasay system of lakes turned into a large body of water. According to various sources, about 1.8-2.2 km^3 of collector-drainage water is annually discharged from the irrigated massifs of the Golod Steppe, 0.2-0.3 km^3 of atmospheric precipitation falls on the surface of the reservoir and the annual evaporation is 2.5-2.9 km^3 . According to the Glavgidromet, the annual discharge from the Chardarya reservoir is 2.0-2.5 km^3. At the same time, if we neglect even the underground inflows from the surrounding groundwater deposits, then in the coming years we should expect an increase in the man-made object.

According to the Glavgidromet, the regime of the lake system in recent years has been affected by discharges from the Chardarya reservoir. Discharges may be repeated, or vice versa, increase the efficiency of the Toktagul reservoir and the throughput of the Syrdarya riverbed, downstream of the Chardarya reservoir, may lead to a reduction. Leaks of less than 1.5 km^3 will lead to a slow reduction in

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the lake system. In the conditions of the termination of passes from the reservoir, the water level in the lakes for the first three years will drop to 0.4-0.6 m per year. The annual growth of mineralization in the initial period of decline is estimated at 0.4-0.5 g/l. Under this option, by 2022 the level of the lakes will decrease to 212.0-242.0 m, the average mineralization will reach 8.0-9.6 g/l and the area of the dried bottom will be 240-260 km^2.

1.5 km^3 flows from the Chardarya reservoir will lead to flooding of new pasture areas. Each subsequent km^3 of water will raise the level by 0.2-0.3 m and flood 50-70 km^3 of the territory. The most characteristic consequence is that the lake system strongly influences the groundwater regime of aquifers, i.e. will lead to a change in the hydrogeological conditions of the region. The change in the hydrogeological conditions of the region will be expressed in the form of an increase in the depth of occurrence and mineralization of groundwater in aquifers as a result of backwater. The appearance of swampy flooded areas, the deterioration of the reclamation state of irrigated lands. In addition, intensive processes of secondary salinization of lands can occur and salty desertification can form.

The Aydarkul-Tuzkan-Arnasay lake system will possibly influence the hydrometeorological regime of the region. With an increase in the area of the lake, in coastal areas, air humidity rises, a smoother thermal regime is formed, and wind speed increases. In dry periods, a reservoir can change the air temperature by 1-3°C, increase the wind speed by 10-15%, moisten part of the air space throughout the entire troposphere by 15-20%. All this can ultimately lead to an increase in the amount of precipitation in the region.

According to the geological and structural conditions in the zone of direct influence of the Aydarkul-Tuzkan-Arnasai technogenic object, there were Foothills, Dustlik and Central deposits of groundwater. In the Predgornoye field, the man-made object is the final place for the completion of the hydrogeological process, i.e. is an area of groundwater discharge by evaporation and the mineralization of water reaches up to 9.5-11.6 g/l.

In the Dustlik groundwater deposit, groundwater is formed mainly due to the filtration of irrigation water from canals and irrigated lands. The groundwater discharge zone is the collector-drainage network and vertical drainage wells. The mineralization of groundwater in the regional plan increases from east to west and from north to south from 3.2-5.5 to 10.6-15.7 g/l and more.

In the Central field of groundwater in the cover Quaternary deposits, aquifers contain mineralization water from 3.5 to 10.4-15.6 g/l. Irrigation-groundwater resources in these horizons are formed due to filtration from sprinklers and irrigated fields and overflow (feeding) from below from subpressure waters of the operational horizon with a predominance of horizontal water exchange. Groundwater occurs at a depth of 1.5 to 15.0 m. The mineralization of groundwater decreases from above (from 5.4-10.3 g/l.).

It should be noted that groundwater deposits directly adjacent to a man-made object have different trends in its influence.

In the Predgornoye groundwater deposit, a natural stop has been preserved in the areas of formation and transit of groundwater and in the zone of groundwater discharge, the natural situation has changed as a result of the backwater of Lake Aydarkul.

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In the Dustlik and Central deposits (before the appearance of a man-made object), artificial water-pressure systems were formed within the main canals and collectors in the irrigated zone, which actively influenced the formation of irrigation-ground waters and their hydrochemical state. In some places, within the Central groundwater deposit, vessels of low-mineralized groundwater from the Golodnosteppe aquifer complex were distributed, which were used for decentralized water supply, farming departments. The appearance of the load of a technogenic object and their imposition on the processes of formation of irrigation-ground waters leads to the inexpediency of using subpressure low-mineralized waters, because during operation, there will be suction “from below” of non-standard waters, due to the backwater of the waters of the man-made object, the outflow of groundwater from the upper aquifers will be difficult.

Thus, at present, in the zone of active influence of the Aydarkul-Tuzkan-Arnasai man-made object, there are Dustlik, Central and Predgor groundwater deposits. A man-made object can indirectly affect the hydrodynamic, hydrogeochemical conditions at the Nizhnesanzar, Ravat, Zaamin deposits of groundwater and the process of formation of groundwater in mountain ranges framing the Golodnostepsky region from the south.

References

1. Ишанкулов Р., Валиев Х.И., Норов А., Позилов М. Создание научной основы рационального использования водных ресурсов Центральной Азии в рыночных условиях «Создание систем рационального использования поверхностных, подземных вод бассейна Аральского моря». (Материалы Международной научно-практической конференции), Ташкент, 2003 г.
2. Ишанкулов Р., Норов А., Позилов М. Нарушение естественных процессов активного водообмена Голодностепского региона и его воздействие на изменение рационального использования ресурсов подземных вод. «Создание систем рационального использования поверхностных, подземных вод бассейна Аральского моря». (Материалы Международной научно-практической конференции), Ташкент, 2003 г.
3. Эшонкулов Р. Норов А., Позилов М. Жиззах вилоятида сув ресурсларини ифлосланиш сабаблари. «Загрязнение пресных вод аридной зоны и уменьшение» Материалы Международного симпозиума. Ташкент 2004 г.
4. Позилов М.Н. Структурно-гидрогеологический анализ формирования подземных вод Санзарских месторождений //Журн.«Вестник ТашИИТа». - 2008. - №. 1. - С. 68.
5. Позилов М. Н., Каримова Ф. С. Формирование химического состава вод Айдаркуль-Тузкан-Арнасайского техногенного объекта //Высшая школа: научные исследования. - 2021. - С. 117-122.