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SOME REMARKS ON THE LEVEL OF STUDY OF THE GEOLOGICAL AND HYDROGEOLOGICAL STRUCTURE OF FERGANA AREA

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Abstract
The article mainly presents conclusions about the geological and hydrogeological structure of the Fergana region based on the scientific research and opinions of geologists. In addition, information on the deposits of the Fergana region, territorial divisions, Quaternary deposits, and the distribution of underground water, as well as the creation of maps, is presented.

Keywords: Fergana, geological and hydrogeological structure, Central Asia, Oloy ridge, Pleistocene, alluvial layers, young complexes, hydrogeological, drinking water, underground water reserves, fresh water, engineering-geological, tectonic and geomorphological conditions.

Introduction

Introduction

The study of the geological structure of the Fergana region, which is part of Central Asia, began mainly at the end of the 19th century, in particular, the article published by the geologist I. V. Mushketov in 1904 under the name "Turkestan" is an example of this. In this article, the scientist mentioned his initial thoughts about the geological structure of the region. I.V. Mushketov divides the ridges surrounding the Fergana region into two directions - Aloy (northeast) and Fergana (northwest). He believed that the Aloy (northeastern) ridge is related to ancient, Paleozoic deposits, and the northwestern direction is directly related to relatively younger, mostly Cenozoic deposits. These fold directions define the circular arrangement of the Fergana structural zones [1,2,3].

After that, starting in 1909, V. N. Weber divided the southern Fergana into ten main parts and started territorial research and emphasized the migration of ancient "dry deltas" to the north.

O.K. Lange can be considered to have studied the quaternary deposits of the Fergana area in his scientific research almost in detail, but he connected his scientific-practical work and activities with more hydrogeological research. From 1928, under his leadership, hydrogeological research were carried out in the entire Fergana region. Mujchinkin, V.V. Bezobrazova, N.V. Podoba, M.M. Krylov and others participated. In addition, the geological and hydrogeological structures of this area are described by P.P. Vasilkovsky (1935, 1942, 1951), S.S. Schultz (1937,1948), N.B. Veissoevich (1945), K.V. Kurdyukov (1948), Yu.A. Skvortsov (1954), V.I. Popov (1932, 1940, 1954, 1963), G.A. Mavlyanov (1949, 1958, 1966-69), V.G. Kleinberg (1967) and others have also studied through scientific and creative data collection [4,5,6,7].

Geologically, the lowlands of the Fergana region were not fully explored at that time. The remote mountainous regions of the Fergana Valley are well studied, and for some reason, less

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attention is paid to the central part. In my opinion, the reason for this is mainly due to the presence or distribution of more minerals in the mountains and hills. As an example of this, we can cite the mercury mine, antimony mine and many other mines in the neighbouring Kyrgyz Republic. The flat part of Ferghana was mainly studied in the process of hydrogeological and engineering-geological research, mainly by digging wells with a depth of 10-100 meters; in addition, until 1950, geological and lithological maps with a depth of 10-20 m were compiled with the participation of the above-mentioned scientists.

In 1951, based on the materials of the hydro regime station, V.A. Gentz compiled a summary report from 1945-1949. A geological-lithological map is attached to the work, in which Central Fergana is given little attention, the scheme for dividing the Quaternary deposits into parts is not sufficiently justified, and the thickness of the Quaternary deposits (up to 600 m) is greatly underestimated. Nevertheless, proposed schemes for dividing the Quaternary period have been developed. However, V.A. Haynes (in some Russian sources or other materials referred to as Gaines V.A.) in his last scientific works in the field of geology and hydrogeology (1962, 1965) stated that the thickness of Quaternary deposits in the Fergana lowland can reach 1000 m. and notes that the division scheme he proposed earlier is only a reliable source of Quaternary deposits for the younger complexes of Sirdarya and Holodnostep. necessary information will be given.

Quaternary deposits, mainly complex geological and hydrogeological conditions at a depth of 100 m by O.K. Inzhevatova, V.A. Gaines, G.M. Mzhelskaya (in 1953-54) and engineering-geological conditions by G.Kh. Khalikov, M. Khalikov in a scientific-practical way was created during the study and also developed during the study by I. Nurmatov and others (1958-61 years). Exploration, construction and production of wells for water at a depth of 360-400 meters, as well as areas deeper as a result of drilling wells at a depth of 3000-4000 meters, have been explored [5,6,7,8].

Later, according to the results of processing the biorhythm-stratigraphy of standard well No. 1 as a result of drilling on the edges of alluvial layers of Shakhimardon by the Fergana Hydrogeological Expedition, A.I. Gorshkov and M. Kh. Godin (1972) determined the thickness of Quaternary deposits. Second, according to the descriptions of V.A. Gaines (1951), and O.A.Rijkov, an exploration well with a depth of 1300 meters was drilled and the necessary data was prepared. According to the data, the average thickness of Quaternary deposits is 848 meters.

According to the currently accepted and approved division scheme in Uzbekistan, the Fergana region is divided into the following complexes according to the structure of Quaternary layers (deposits): Sokh, Tashkent, Holodnostep and Syrdaryo. This division is based on the geological-geomorphological principle and is well connected with the neotectonic conditions of the development of the Fergana lowland.

Below, the level of study of the map of the Ferghana territory is expressed by conventional symbols.

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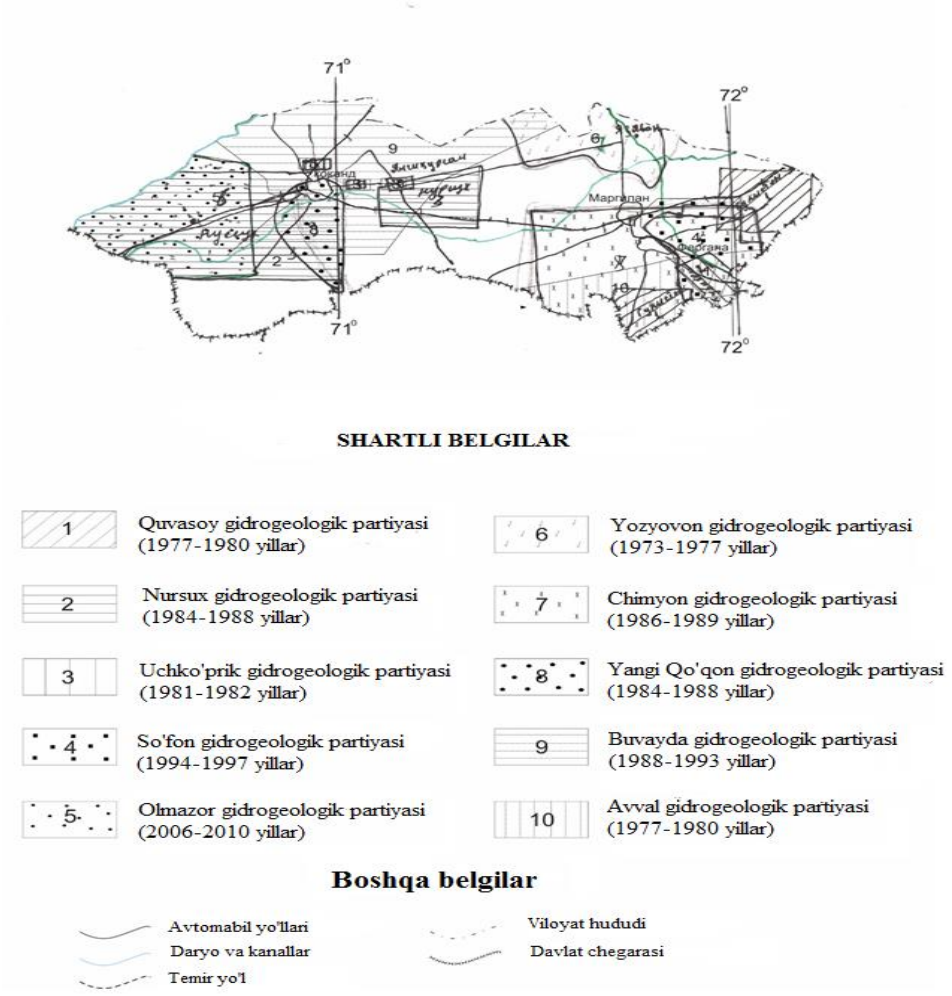

As for the hydrogeological conditions of the area, the initial hydrogeological data was provided by A.M. Konshin, V.A. It can be seen in the geological and hydrogeological records of Obruchev, K.I. Bogdanovich and other scientists.

It would not be a mistake to say that the systematic geological and hydrogeological study of the Fergana Valley began mainly after the 1920s. General and special geological and hydrogeological studies were studied by Z.B.Selitrennikova and L.I.Tarasov (1929), O.K.Lange and F.F.Mujchinkins (1931), G.I.Olovyannikov (1931), M.A. Palyakov (1931-1932), and in this regard they data left by [6,7,8,9].

In 1932, under the leadership of N.F. Bezobrazova, in connection with the development of the initial scheme for the reconstruction of irrigation systems, hydrogeological studies were carried out within the territory of the Fergana Valley by the former Central Asian State Institute for the Study and Design of Hydrogeological Structures. As a result, a 1:200,000-scale hydrogeological map was created.

In 1949, V.A. Heintz and M.A. Schmidt developed the principle of hydrogeological and meliorative zoning and created a map on a scale of 1:500,000, which provided information on the leaching, passage and continental salinity of underground water in this area.

In 1953-1954, O.K. Under the leadership of Inzhevatova, groundwater from 10 to 100 meters deep was studied as the main object.

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In 1963-1965, hydrogeological specialists Kayumov D.K. T.K. Hydrogeological studies were carried out by the Khojiboyevs, after which reports were prepared on the results of drilling parametric wells and information was collected on the alluvial deposits of the river and the use of industrial groundwater and their predictive assessment.

In 1977-80, hydrogeologist Kalianidi G.D. detailed hydrogeological research carried out in the valley of the Isfayramsoy River and the operational reserves of underground water were calculated to supply water to the city of Kuvasoy. (Kuvasoy Hydrogeological Expedition): A - 20.7 thousand m^3 per day; B - 13.8 thousand m^3 per day; C - 27.7 thousand m^3/day and only 62.2 thousand m^3/day.

In 1971-1973, complex hydrogeological and engineering-geological maps were made on the scale of 1:200,000 in the territory of the Republic of Uzbekistan, including underground layers K-43-XXV and XXXII in the territory of Fergana, and research work was carried out.

In 1975-1976, underground water for water supply and irrigation was searched and studied in the hilly zone of the Southern Fergana region of the former Kapchugai Hydrogeological Party. Aquifers of Upper Neogene and Lower Quaternary deposits were studied mainly within the Rishton, Kapchugai, Akbilol, Kuva and Talmazor hills. 25 intervals were tested in 9 wells with a depth of 225 to 300 meters. During the testing of wells equipped for different aquifers, waters with a total mineralization of 0.36 to 2 g/l were obtained. The specific flow rate for different horizons varies from 0.004 to 8.8 l/s.

In 1975-1977, the II Beshalish hydrogeological party carried out a detailed study of underground water in the Beshalish alluvial layers to provide technical water to the Fergana-Margilan industrial complex. (author Makhkamov M.M., Rahmatov K.R. and others). It was studied and confirmed that the hydrogeological deposit reserves of underground water of category A + B are in the amount of 3.0 m^3/second.

In 1977-1980, the Avval Hydrogeological Party of the former Fergana Hydrogeological Expedition searched for underground water in the Chimyon-Avval lowland for the domestic and drinking needs of the former Fergana-Margilan Industrial District. At the same time, the main attention was paid to the study of the hydrogeological condition through the 300 m deep lithological section and the study of changes in depth and physicochemical properties (general hardness) of groundwater in the area.

In 1978-1980, hydrogeologists M. Eshboyev and others conducted hydrogeological research works by the former Altiariq hydrogeological party in order to substantiate the possibilities of irrigating the lands in the southern part of the Altiariq district using underground water. As we know, this process remains one of the urgent issues during the water shortage these days. In this regard, according to the decision of the President of December 7, 2022 "On additional measures for the protection of underground water resources and regulation of their rational use" No. PQ-439, in the Republic to further improve the system of groundwater use and well drilling, to strengthen state and public control over the protection of groundwater resources, to widely promote the culture of rational use of water among the population, to prevent their decrease in quantity and pollution, and as a result, the decision to provide the population with quality drinking water in the long-term perspective was the same.

We know that in some regions of the Republic of Uzbekistan, the water level has decreased by 5 or 10 meters or even more compared to the long-term average level of underground water.

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Therefore, drilling wells for underground water and using land water-saving technologies from existing wells is appropriate at the moment. It should also be mentioned that according to the new decision, within the framework of approved state programs and by individuals, drilling of wells up to 25 meters in depth and individual extraction of groundwater up to 5 cubic meters per day for personal needs is allowed. will be done.

In 1981-1982, the former Uchkoprik hydrogeological party conducted a preliminary investigation of groundwater in the marginal part of the Sokh alluvial deposits in order to establish the water supply of the centres of Dangara, Uchkoprik and Buvaida districts of Fergana region. The operational reserves of fresh underground water were calculated in the amount of 8.6 thousand m^3 per day in the city of Dangara, the regional centre; including for categories A - 2.3 thousand m^3/day, B - 6.3 thousand m^3/day, 10.4 thousand m^3/day in the centre of Uchkoprik district; including for categories A-5.9 thousand m^3/day, B-6.34.5 thousand m^3/day, etc. Yangikurgan 10.4 thousand m^3/day; including for categories A - 5.1 thousand m^3/day, B - 5.3 thousand m^3/day. Total 29.4 thousand m^3/day; including for categories A - 13.3 thousand m^3/day, B - 16.1 thousand m^3/day.

In 1981-1984, the former Khamza hydrogeological party carried out the preliminary investigation of groundwater within the alluvial deposits of the river. Altiariqsoy and Fayziobodsoy, Khamza city of Fergana region, and district centre of Altiariq cities. The operational reserves of fresh underground water are estimated at 111.46 thousand m^3 per day; including in categories A - 18.58 thousand m^3/day, B - 37.15 thousand m^3/day and C - 55.73 thousand m^3/day.

In 1983-1986, the former Yangiabad hydrogeological group carried out preliminary investigations of groundwater at the edge of the alluvial deposits of the Isfayramsoy and Shokhimardonsoy rivers (Altariq-Beshalish field) and calculation of operational reserves for water supply to the centre of Yozyovon district of Fergana region.

As a result of these explorations, the hydrogeological parameters, as well as the quality of underground water in the aquifer of the Quaternary deposits of the Altiariq-Beshalish mine, were determined. The operational reserves of freshwater are estimated at 11,000 m^3 per day; including A-11 thousand m^3/day.

In 1984-1987. Extensive hydrogeological and engineering-geological studies were conducted on a scale of 1:50,000: K-42-132-B, G; K-43-121-A, B; K-43-133-A; K-42-144-B (Mindon ICP). 21 geological-genetic complexes were identified: 18 surface deposits and 3 basic rocks were studied. Maps of Quaternary deposits are made on a scale of 1:50,000. Hydrogeological and irrigation geological zoning of the area was developed for the purposes of reclamation, forecasting the level of underground water and the hydrochemical regime.

In 1984-1988, a preliminary exploration of groundwater in the Kirov and Yaipan sections of the Isfara mine and the Baghdad section of the Sokh mine by the former Nursuq hydrogeological party, as well as in the Sokh-Isfara hills, the Sokh-Isfara intercone depth and Navkat in detail search was carried out. Certain works have been carried out to provide domestic and drinking water to the regional centres and large rural settlements of the former Kirov (now Beshariq district), Uzbekistan and Baghdad districts of the Fergana region.

As a result of these explorations, hydrogeological indicators, as well as the quality of groundwater in the Quaternary period within the Isfara and Sokh fields, were determined. The

operational reserves of fresh underground water are estimated at 93.2 thousand m^3 per day; including for categories A - 57.6 thousand m^3/day and B - 35.6 thousand m^3/day.

In 1986-1989, the former Chimyon hydrogeological party (M.M. Mahkamov, A.R. Borodin, etc.) carried out a reassessment of the operational reserves of underground water in the existing Fergana district "Avval" and "Pakana" water intake facilities. A detailed study of underground water was carried out in the deposits of the prehistoric period. Also, in order to justify the supply of domestic and drinking water in the cities of "Logon", Fergana and Margilan in the district. It was determined that the operational reserves approved by the approval of state reserves are in the following amount: For household drinking water A - 220 thousand m^3/day; B - 221.6 thousand m^3/day; C1 is 62.2 thousand m^3/day and 69.22 thousand m^3/day for technical needs.

In 1986-1989, complex hydrogeological and engineering-geological research works were carried out on a scale of 1:50,000 in order to justify reclamation and land development in the inter-mining spaces of the Southern Fergana rivers: a part of sheets K-42-132-V. , G; K-43-143-B; K-42-144-A-B (Hingiz ICP). 29 geological-genetic complexes were identified: 24 surface deposits and 5 rocks were studied. Maps of Quaternary deposits, hydrogeological and engineering geological maps, as well as a 1:50000 scale map were created. The hydrogeologist and engineer carried out the zoning of the territory for the purpose of land reclamation, predicting the level, level and hydrochemical regime of the geological underground water.

In 1987-1990. Comprehensive hydrogeological and engineering-geological research works were carried out on a scale of 1:50000: K-42-130-G; K-43-131-A, B; K-42-142-B; K-42-143-A, B; U-42-11-A (Ukcha IGP). 12 geological and genetic divisions of Quaternary deposits have been identified. 1:50000 scale hydrogeological, geomorphological, Quaternary sediments, engineer-geological and other types of maps were created. Hydrogeological and engineering-geological zoning of the area was developed for the purposes of reclamation, forecasting the level of underground water and the hydrochemical regime.

In 1987-1990, in order to justify the provision of domestic and drinking water to rural settlements in the Rishton and Altiariq districts of the Fergana region, the former "Okjar" hydrogeological party carried out underground excavations in the Quaternary deposits of the Altiariq-Beshalish area and the eastern part of the Sokh mine. initial exploration works were carried out in its waters.

The operational reserves of fresh underground water for the provision of domestic and drinking water to the settlements of Rishton and Altiariq districts were calculated in the amount of 34,127 thousand m3 per day; including for categories B - 18,238 thousand m^3/day and C1 - 15,889 thousand m^3/day.

In 1988-1990, comprehensive hydrogeological and engineering-geological research works were carried out in the territory of the Fergana region on a scale of 1:50000: K-42-130-V, G; K-42-129-G; K-42-142-A-B (Shorsu Engineering Geological Party). 20 geological-genetic complexes were identified: 17 surface deposits and 3 bedrocks were studied.

In 2003-2005, in order to provide domestic and drinking water to the villages of Altiariq, Okhunboboyev, Toshloq, and Yozyovon districts, the former "Tinchlik" hydrogeological party investigated the groundwater of the Quaternary deposits of the Altiariq-Beshalish field, and the Quaternary of the river valley searched for underground water in period deposits. For

settlements of the Sokh district of the Fergana region, the exploitation reserves of underground water were calculated in the amount of 13,217 thousand m^3/day; including categories B-4.43 thousand m^3/day and C1 - 8.787 thousand m^3/day.

Also, in 2003-2005, the former Beshkhirman hydrogeological party searched for underground water from the Sokh mine in order to provide domestic and drinking water to rural settlements with low water supply in Uzbek, Uchkoprik and Buvaydin districts of the Fergana region. works were carried out.

The exploitation reserves of fresh underground water to supply water-poor rural settlements in Uzbek, Uchkoprik and Buvayda districts with domestic drinking water were calculated in the amount of 16,106 thousand m^3 per day; including for categories B - 5.52 thousand m^3/day and C2 - 10.586 thousand m^3/day.

In 2006-2010, Almazor hydrogeological party carried out regional hydrogeological studies on the re-estimation of the predicted groundwater resources of the Isfara field in connection with the change of water management conditions and the development of new lands for irrigated agriculture on an area of 570 km².

In 2013-2016, the former Okhunboboyev hydrogeological group conducted a survey of the population's domestic and drinking water in the Quaternary deposits of the Altiariq-Beshalish and Sokh deposits, as well as in the Quaternary and Quaternary deposits of the Sokh-Haydarkon intermountain depth. Groundwater assessment was carried out for the purpose of grounding. 26.0 thousand m^3/day, 11.9 thousand m^3/day B-11.9 thousand m^3/day and C1-14.1 thousand m^3 underground water reserves in the villages of Dostlik, Langar, Muqimiy and Khushyar village of Fergana region researched and approved. In particular, "Langar" -11.2 thousand m^3, "Mukimi" -12.8 thousand m^3, "Dostlik" -1.4 thousand m^3 and "Khushyor" -0.6 thousand m^3/day.

According to the above materials and hydrogeological data, many settlements of the Fergana region can be provided with drinking water at the expense of underground water.

References

1. Report of "Fergana Hydrogeological Expedition" belonging to "Uzbek Drogeology". Ferghana. 2017 year.
2. Gafurov T.A., Kulagina T.VB, Saidova Ya.V. "Termalnye vody Uzbekistana" Sovremennye metody i tekhnologii v reshenii hydrogeologicheskikh, injenerno-geologicheskikh i tectonicheskikh i geoekologicheskix zadach // Materialy Respublikanskoy nauchno-teknicheskiy konferentsii.-T.: GP "Institut GIDROINGEO", 2013. - 264 p.
3. Bazarov A. A. Studying the laws of mercury distribution in underground and surface water in the oil and gas regions of Bukhara-Karshi and Western Siberia and their comparison //Science and Education. - 2020. - T. 1. – no. 3. - S. 86-92.
4. Bazarov A. A. and others "Organization of the properties of local carbonate rocks in Uzbekistan and their innovative use as needs of public consumption". Scientific and technical journal of Fergana Polytechnic Institute 2020. 4 Vol. Special No. 1 issue. Section 3. Pages 212-215.

ISSN (E): 2938-3617
Volume 1, Issue 3, June, 2023.

5. Bazarov A. A. Mercury and subterranean and surface water in the Bukhara-Karshinsky neftegazonos region //Economics and society. - 2020. - No. 12-1. - S. 397-401.
6. Sabirovich I. A., Bazarov A. A., Sodiqovna O. M. Study of the Distribution and Physico-Chemical Properties of Deep Groundwater in Some Areas of the Altiaryk and Besharik Districts of the Fergana Region and Their Rational Use //Eurasian Journal of Engineering and Technology. – 2022. – Т. 5. – С. 120-124.
7. Узаков О. А. и др. Получение нитрата калия методом конверсии //Universum: химия и биология. – 2022. – №. 2-2 (92). – С. 4-9.
8. Базаров А. А. Бухоро-Карши ва ғарбий Сибир нефт ва газ худудларидаги ер ости ва ер усти сувларида симобни тарқалиш қонуниятларини ўрганиш ҳамда уларни қиёслаш //Science and Education. – 2020. – Т. 1. – №. 3. – С. 86-92.
9. Жумабоев А. Г., Базаров А. А., Полвонов Х. М. Каталитик риформинг қурилмаларидан агфу-этан блоки қурилмасига “қуруқ газ” узатишда газ таркибидаги суюқ углеводородларни ажратиб олиш схемасини тадбиқ этиш //Science and Education. – 2020. – Т. 1. – №. 3. – С. 212-216.