Existing Problems in Getting Water Without Dam and Their Solutions

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ABSTRACT

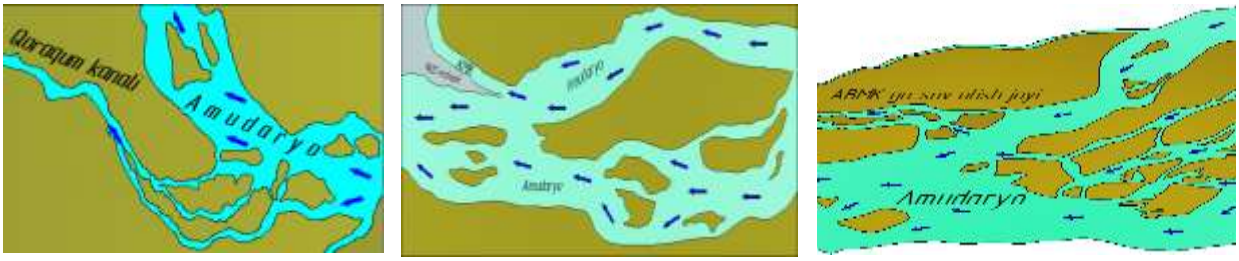
This article presents the existing problems of large damless water intake facilities located in the middle part of the Amudarya, and their causes

Keywords: Amudarya, water intake without dams, turbidity, coastal deformation, washing, channel, river, water level, water consumption

In the middle part of the Amudarya, there are mainly water intake structures without large dams. These are the Karakum canal located upstream of Amudarya about 30 km from the Kerki hydropost - the Karakum river named after S. Niyozov, the main water intake facility for the Karshi Main Canal located about 18 km upstream from the Kerki hydropost, about 250 km from the Kerki hydropost are the main water intake facilities for the Amu Bukhara Machine Canal located downstream.

The Karakum Canal mainly supplies water to the main territory of the Republic of Turkmenistan. The Karakum Canal crosses the southeastern part of the Karakum Desert and the Murgob oases between the Murgob and Tiejdn rivers. Water intake from Amudarya is 12-13 km^3, this indicator is 3-4 times higher than the total flow of rivers in the territory of Turkmenistan. It should be noted that the current moves in the canal, and due to the low elevation of the territory of Turkmenistan, water is pumped to the Karakum main water intake facility.

Of course, this situation is the main reason for the acceleration of processes taking place in the Amudarya basin in the water supply to the Karakum main structure. It should be noted that the consequences of the construction of the Karakum Canal had an impact on all components of the surrounding flora, fauna, microclimate, terrain, engineering hydrology, and geographical environment. As the canal bed passes through the sand dunes, 40% of the water is absorbed into the sand dunes. In addition, in this area and in the channel bed, the process of rapid coastal washing, which is called by local residents, is observed more often.



Pic-1. Location scheme of the water intake facility without a dam to the Karakum canal, KMK and ABMK in the middle stream of the Amudarya (2022)

As a result of this, events leading to negative consequences such as the burial of the riverbed, its transformation, the washing of irrigated agricultural fields, and the washing away of settlements are observed. It should be noted that the process that occurs rapidly in the Karakum canal bed and river beds was studied by A.V. Muratov as a result of experimental research, and the process was described in a sufficiently reasonable way. The rapid washing of the shores in this area of the Amudarya corresponds to the period when the dynamics of the water level and consumption change dramatically in the last decade of May and June. However, in some areas of the riverbed, seepage occurs even when the water level drops. In experimental researches, the drilling speed was observed up to 2 m/h, and the washing cycle was 10-60 m, and the depth was 5-10 m. established The results of many years of research have been recognized as the main factor in the reshaping of the Amudarya and Karakum canal basins. The formation of meaning is based on the law of sequence, the formation of one causes the formation of the second process. Deigish is pushed along the coast in this way, and its "step" is 7-10 m at different intervals. from 15-40 m. established

Of course, this process accelerates the silting process in the river bed and channel, causing a sharp decrease in the useful capacity of the water reservoir located in the channel bed. In addition, about 100 mln. Tons of suspended particles and particles moving along the bottom of the riverbed enter, making the operational conditions of the channel difficult. During the last half century, as a result of this process, it was observed that the small tributaries flowing into the Karakum canal and the 350 mln.m^3 lake of Kelif tindingich with an area of 150 km^2 were covered with mud. In recent times, it has been observed that 3-4 times more nanos than the estimated amount of nanos entering this damless water intake facility.

As a result of a sudden change in the flow dynamics in the area of the Amudarya damless water intake facility, conditions that complicate its operational conditions in the channel bed are constantly being observed.

The second large damless water intake facility located in the middle of the Amudarya is a water supply facility for the cascade of pumping stations of the Karshi Main Canal, which mainly supplies water to Kashkadarya, the largest region in the south of the Republic of Uzbekistan. According to the classification of the processes in the riverbed, Amudarya belongs to the rivers with a moving riverbed. The damless water intake facility from the Amudarya to the canal is located 18 km upstream from the Kerki hydropost and is designed and operated with a water intake of 180m^3/sec. The average turbidity of the water entering the Amudarya is 5 kg/m^3, and the amount of sediment entering the canal bed is 8-10 million. tons. In this area, the river flows along the riverbed. The mobility of the Amudarya basin ensures the constant quality and guaranteed water intake in the area of the Karshi Main Canal without a dam. A number of activities are being carried out to improve the intake of water to the main water intake facility, the entrance to the main canal has been redesigned and reconstructed.

It should be noted that since the beginning of the exploitation process, the direction of the current has changed, and the main fairway is always on the left bank. During the Mejen period, the Amudarya riverbed mainly moves through one network in this area. Depth and planar deformations are accelerating

in the river bed. As a result of the sudden rise and fall of the water flow and the change in consumption, the process of seepage also occurs in the lower area of the water intake facility without a dam. As a result of rapid deformation processes in the area of the water intake facility, the height of the Amudarya river bed is also increasing. The rise of the bottom accelerates the process of silting and reduces the amount of waste entering the main water intake facility.

Conclusion.

Since the start of operation of hydrotechnical structures in the middle part of the Amudarya, the flow axis has changed, and the main fairway is always on the left bank. In periods of low water, the Amudarya river flows mainly through one channel in this area. In the riverbed, deformations in terms of depth and width are accelerating. The analysis of the studies carried out in the middle course of the Amudarya shows that the speed of the coastal washing current was observed up to 2 m/h, and the washing cycle was 10-60 m, and the depth was 5-10 m. As a result of the sharp rise and fall of the water flow and the change in consumption, the operational conditions of the water intake facility without a dam are becoming difficult. The rise of the bottom accelerates the process of silting and reduces the amount of water entering the main intake.

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