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IMPROVEMENT OF TECHNICAL AND ECONOMIC INDICATORS OF "UZUNBULOQ" PUMPING STATION.

Annotation: *This article presents recommendations for improving the technical condition of the "Uzunbulok" pumping station. In 2020, water-saving technologies were introduced on 133,600 hectares of land in our republic. In this way, over the past years, the areas where efficient irrigation technologies have been introduced have reached 291,200 hectares, making up about 7% of the total irrigated land.*

Key words: *Pump, pumping station, technical indicators.*

The pumping station was designed by "Jizzakh Melioloyiha" organization. In the received data, the types of crops in the irrigated area, irrigation regimes of crops and irrigation procedures are not given. Therefore, we conduct all calculations based on the schedule of "Water consumption" recommended by the "Pumping stations and energy administration" of Jizzakh region. Table 1 shows the water consumption levels of the pumping station during the irrigation periods, and Figure 1 shows the water consumption graph of the crops in the water-bearing area.

The following amounts were accepted in the accounts:

irrigated area-385 *ha*;

the coefficient of useful work of irrigation networks is 0.8;

forcing coefficient-1.1

Based on the quantity of the given hydromodule for each period, consumption water consumption is determined by the following formula:

$$Q_i = \frac{\sum q_i \cdot \Omega \cdot LUF}{1000 \cdot \eta_{m.c.}}$$

here: Ω– total land area, ha;

LUF – land use factor $LUF = 80\%$;

$\eta_{m.c.}$–efficiency of machine canal $\eta_{m.c.}$=78%.

We determine consumption water consumption for each period.

Table 1.

Irrigation period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Consumption water costs Q m^3 /s	0,33	0,45	0,73	0,81	0,92	0,98	1,05	1,3	0,86	0,69	0,56	0,5

Then, based on Table 1, we will build a graph of water consumption for the general irrigation period.

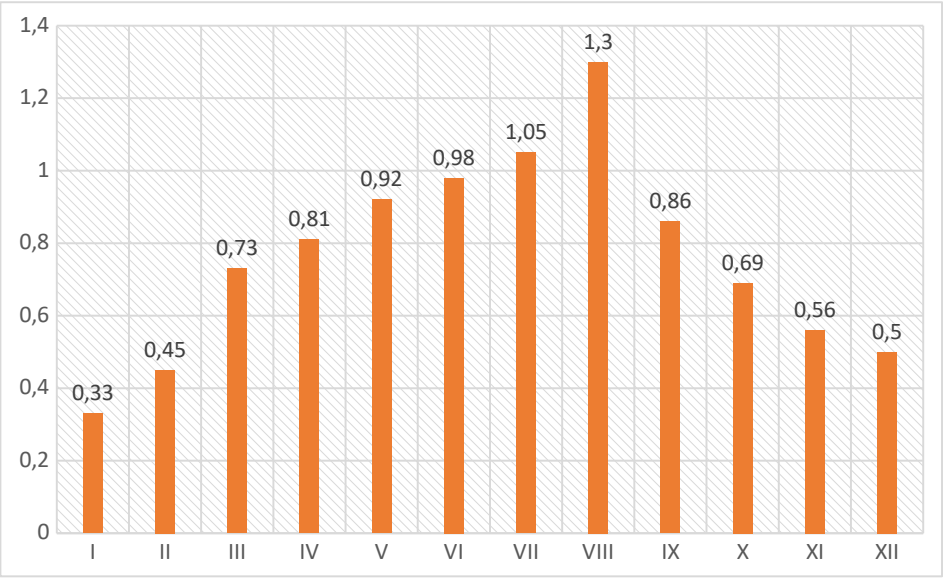

Fig 1. Water consumption graph.

Hydraulic calculation of water-carrying and machine channels of the pumping station

The hydraulic calculation of the machine channel is carried out against the maximum consumption. The maximum consumption of the pumping station I

am designing is Q_{ps}=3,01m^3/s. The pumping station is checked for accelerated consumption.

Accelerated consumption is defined as follows:

Q_{Accel}=1,2•Q_{ps}=1,2•1.5=1.8 m^3/s

Based on the given soil type and Q_{Accel} consumption, the following values are accepted:

- soil type - fine sandy soil;

- roughness coefficient n = 0.0225

- slope of channel walls m = 1.5;

- the width of the upper part of the dam is a= 2÷1.5, and the reserve of height above the water level that accelerates the dam is Δ = 0.4;

- limit speed of soil washing v= 0.7÷1m/s.

- channel bottom slope i= 0.0002;

- the width of the channel bottom is determined as follows:

$$b_c=1.2*Q_{max}^{\frac{3}{2}}=1.2*1,5^{\frac{3}{2}}=2,2m$$

$$v=1 \text{ m/s}$$

Hydraulic elements of the channel are calculated using the following formulas:

-h– water depth in the water supply channel;

-$\omega=(b+mh)h$- m^2channel live section surface;

-$\chi=b+2h\sqrt{(1+m^2)}$; m –wetted perimeter;

-$R=\omega/\chi$, m-hydraulic radius;

-$C=R^{1/6}/n$ Shezi coefficient;

-$v=C\sqrt{Ri}$;$\frac{m}{s}$–¿the speed of the water in the channel;

-$Q=\omega*v$;$\frac{m^3}{s}$–¿water consumption.

Information about water levels in the canal.

At the accelerated water level:h_{Accel}=1,08m;

At the maximum water level:$h_{max}=1\,m$;

At the minimum water level: h_{min}=0.33 m

The speed of water flow from the surface of the live section of the channel: v_{Accel}=0.46 m/s;

The maximum speed of water flowing in the channel: v_{max}=0.44 m/s;

The minimum speed of water flowing in the channel: v_{min}=0.24 m/s;

Hydraulic radius of accelerated water flowing in the channel: R_{Accel}=0.62 m;

Maximum hydraulic radius of flowing water in the channel: R_{max}=0.59 m;

Minimum hydraulic radius of flowing water in the channel: R_{min}=0.24 m;

Flowing accelerated water flow in the channel: Q_{Accel}=1.8

Maximum consumption of water flowing in the channel: Q_{max}=1.5

Minimum consumption of water flowing in the channel: Q_{min}=0.2

General conclusions and recommendations:

1. Currently, many pumping stations and devices of water consumers and farms are installed in the channels of the second and third lifting machines.

2. Such pumping stations and devices are mainly being installed in desert regions.

3. "Uzunbulok" small consumption pumping station, which pumps water from the machine channel of the Uzunbulok pumping station, is also the second lifting pumping station.

4. In addition to supplying water to 385 hectares of land, the "Uzunbulok" small pumping station supplies another 350 l/s of water to increase the water supply of the irrigated areas in this area.

5. "Uzunbuloq" small consumption pumping station is important for social protection of the population due to raising water to additional lands and increasing water supply.

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