ASSESSMENT OF THE EFFECT OF SEDIBLES FROM SOKHSOY RIVER TO KOKAND HYDROELECTRIC STATION

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Abstract. *This article is aimed at protecting the Kokand hydropower plant from turbid sediments and straightening the Sokh riverbed.*

Keywords: *flow, sediments, river, water, hydropower, bank*

ОЦЕНКА ВЛИЯНИЯ СЕДИБЛЕИ РЕКИ СОХСОЙ НА КОКАНДСКУЮ ГЭС

Аннотация. *Данная статья направлена на защиту Кокандской ГЭС от мутных наносов и спрямление русла реки Сох.*

Ключевые слова: *сток, наносы, река, вода, гидроэнергетика, берег.*

INTRODUCTION

The management and regulation of river sediments and the regulation of the riverbed have a special place. The Kokand hydropower plant can be considered as a laboratory in its own natural field conditions. Because water flows from this hydropower plant in certain months of the year. The rest of the time, the river is dry. That is, it is possible to see, observe, and measure the changes that occur at the bottom of the river at this time. It is much more difficult to observe these processes when water passes through the hydropower plant.

RESEARCH MATERIALS AND METHODOLOGY

The Kokand hydropower plant currently distributes water to irrigate 59,680 hectares of land. Water permeability of the drainage structure is 238 m^3/sec. When designing the hydropower plant, an 18-hectare settling tank was provided for the collection of large quantities (650,000 m^3) of primary sediments (gravel). The right bank channel of the hydropower plant is designed to carry 100 m^3/s the left bank channel - 40 m^3/s. More than 20 different hydraulic structures have been built in these channel, which include 5 water intake facilities and 1 drainage channel. These are the right coast channel (Q = 110 m^3 / s), the Left coast channel (Q = 32 m^3/s), the Friendship channel (Q = 1 m^3/s), the Dastarkhan channel (Q = 6 m^3/s) and the consumer channel. Water is distributed to the Great Fergana channel (Q = 17.5 m^3/s) as well as to the discharge channel (Q = 100 m^3/s) At the top of the hydroelectric dam, a 5.8 km long right-bank diversion dam was constructed. The height of the dam is 2-5 m. This dam has mainly served to divert the flow to the hydropower plant during the transition period of floods and mudflows.

The Kokand hydroelectric power station consists of two parts, in the first part the water is distributed directly to the canals, and in the second part the water of the Right Coast canal is drained and fed to the canals. The total area of the Kokand hydropower plant is more than 20 hectares. According to the research, the amount of turbidity in the water entering the hydropower plant reaches 3.20 ... 4.67 g / l.

Sedimentary composition consists of fine sands and more gravel. Large gravel sediments cause the washing chamber at the end of the settler to be buried in front of it, so it is necessary to remove them in the ditch [3,4,5,6,7,].

Sediment flowing by the stream has been used as a building material for several years. For the construction and repair of hydraulic structures under the management of the system, as well as the existing cement plant also uses gravel and sand from this hydropower plant.

It is known from the researches that the slope of the riverbed is high and the river sediments flow to the hydroelectric power station [8,9,10,11,12]. The Sokhsay River used to be flooded and flowed all over the river, but now it flows from the left bank of the river. As a result, the left bank of the river was deformed, that is, washed away for several meters. As a result, in the lower reaches of the Sokhsoy River, several tons of turbid effluents flow into the Kokand hydropower plant, which has a negative impact on the operation of the hydropower plant. The data obtained on the basis of studies conducted in natural field conditions (Figure 1,2,3,4) provide data on the graph of changes in water consumption and the amount of sediment in the stream, depending on water consumption.

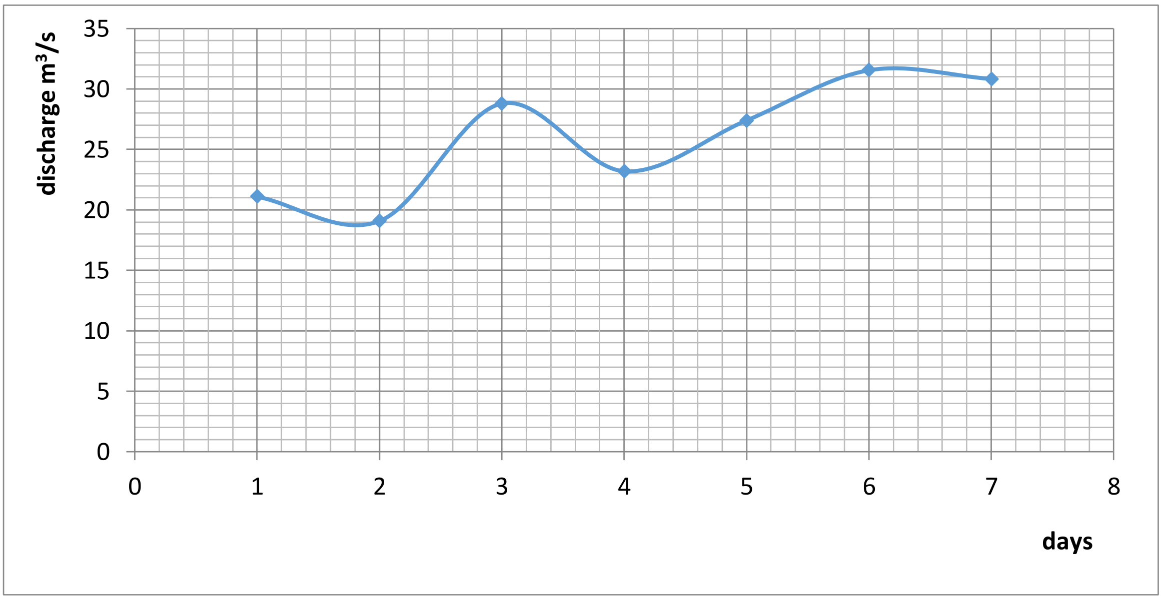

Figure 1. Graph of changes in water consumption in the Sokhsay valley

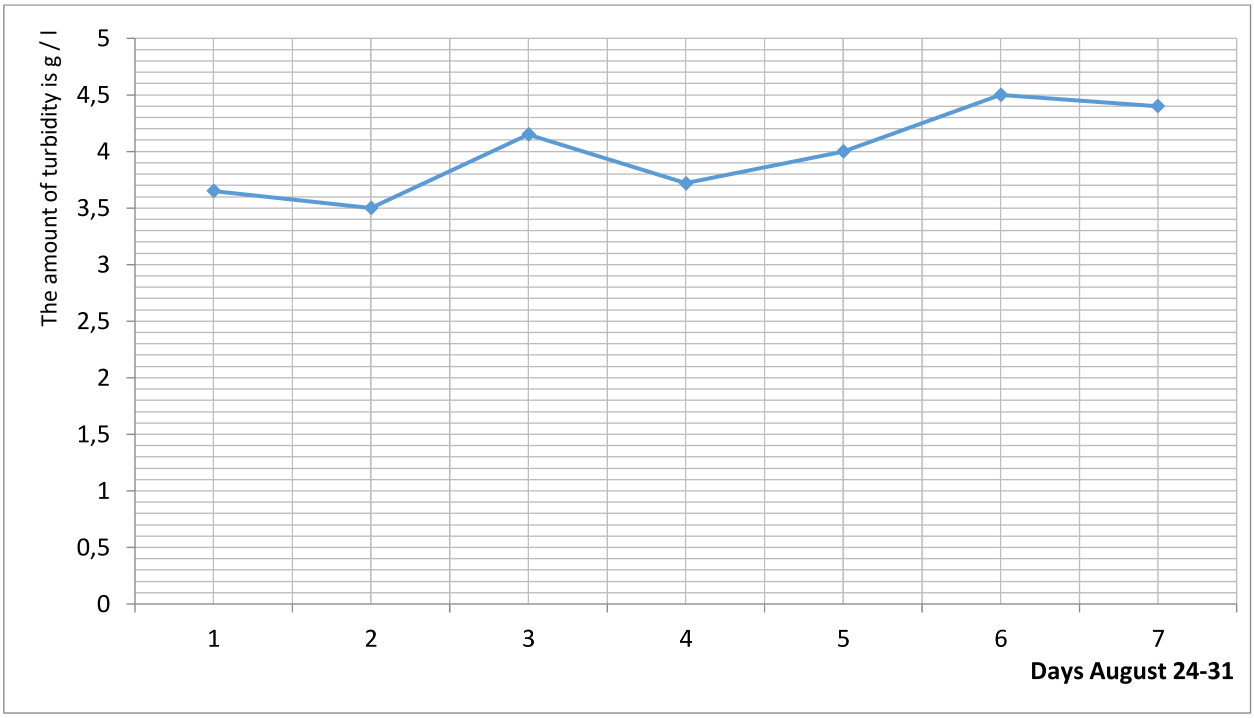

Figure 2. Changes in the amount of turbidity in the flow structure in the Sokhsay valley

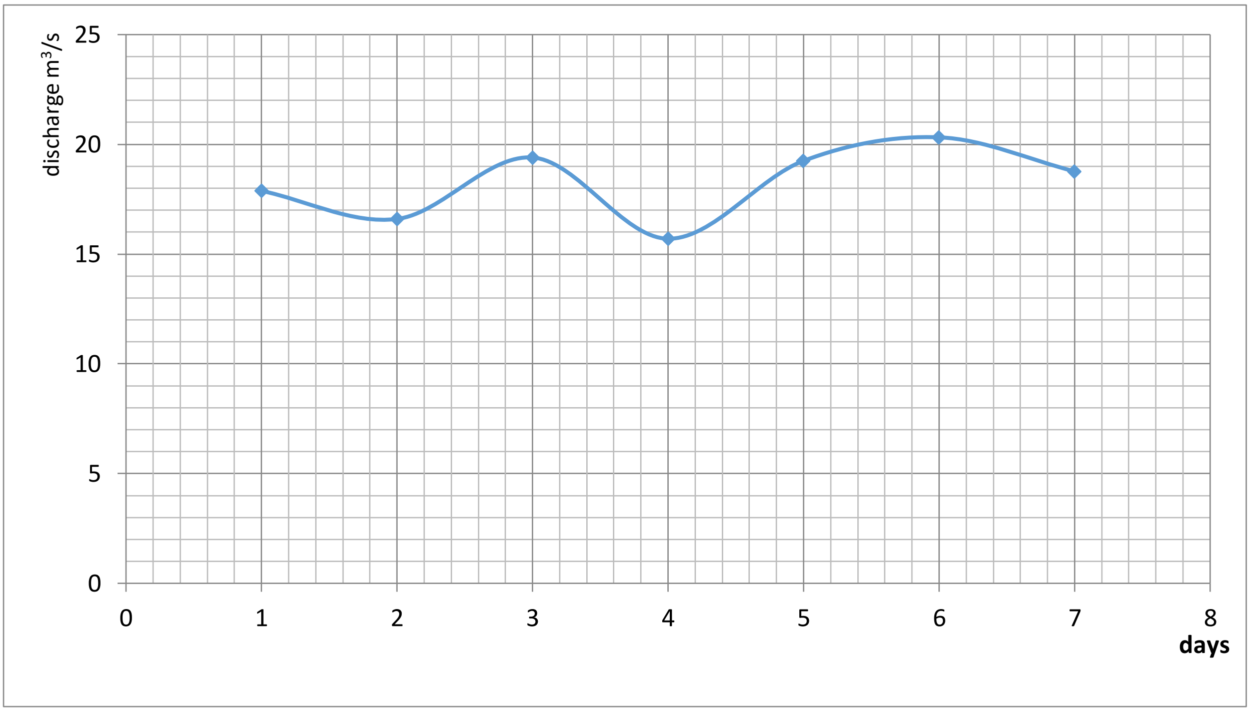

Figure 3. Graph of change of water consumption at the inlet to the tank

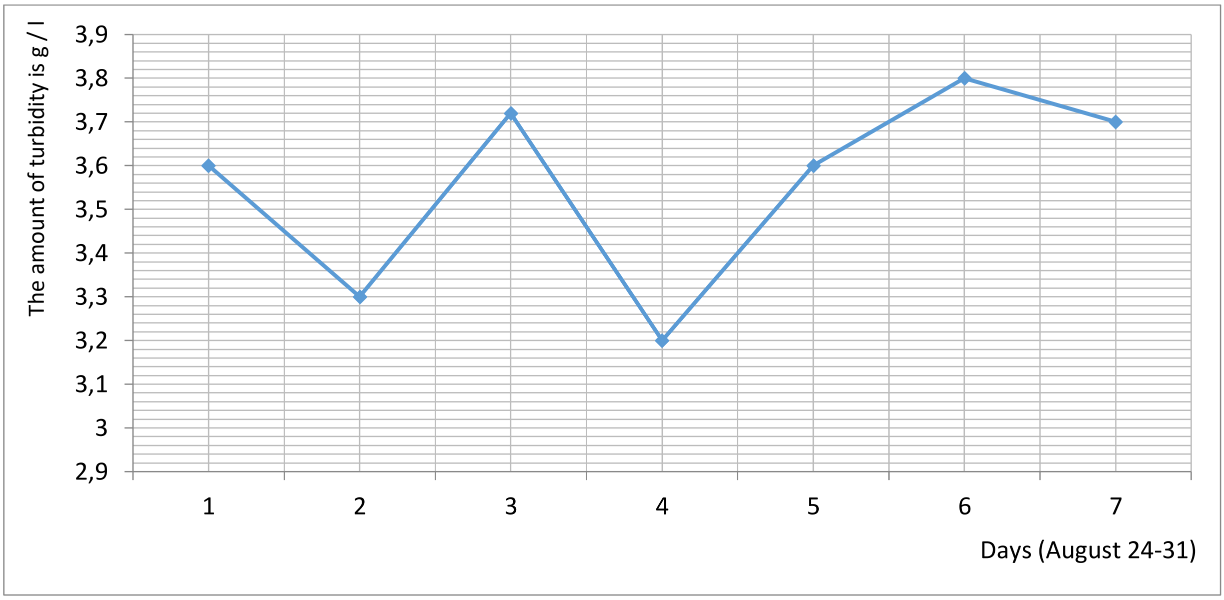

Figure 4. Graph of the change in the amount of turbidity at the inlet to the damper

CONCLUSION

From the graphs above, it can be seen that as the water consumption increases, the amount of sediment in the stream increases, and it can be concluded that as the water consumption increases, the leaching process takes place in the river.

In order to reduce the high flow of the hydropower plant and the turbidity of the canals, it will be necessary to implement a sedimentation project that traps large fractional effluents in the water supply canal.

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