

Research Project of Water Environmental Improvement of Intermediate Channel Neighboring South Lake Biwa Central Area Sewerage Plant

Whole term

2005.12 ~ 2009.3

(Purpose)

Developing South Lake Biwa Central Area Sewerage Plant, intermediate water channel was built between Yabase-Kihan Island and Yabase area in Kusatsu-City. As this intermediate water channel has little discharge by upstream river, little water flow is functioning. Also water exchange between the channel and South Lake Biwa is not frequent. Comparing average water environment of South Lake Biwa, transparency is low, growth of waterweeds in summer makes bad smell and wrong view of the channel.

Furthermore, with the toxic substance which Microcystis in an intermediate water channel, since we are anxious also about the bad influence to a waterworks head, it can be said that the measures against purification of an intermediate water channel are importance and an urgent subject very much. This research project aims to verify a capability of sewerage system for improvement of the channel water environment.

(Results)

(1) Present vegetation of the channel

- Three growth kinds were confirmed; water chestnut, reed and dense waterweed. Each growing area is estimated at 106,250m², 12,500m² and 14,000~120,250m² respectively.
- The vegetation object in the waterway in the end time of September whole-quantity cutting, then the amount of movements of total nitrogen and total phosphorus to a vegetable object, it flowed out with about 15 ~ 23% of the amount (T-N) of inflow loads (at the time of fine weather) from the river of a vegetation luxuriant growth period (May ~ September) to a middle waterway, about 13 ~ 23% (T-P), and the amount of inflow loads, and about 91 ~ 138% of the difference (at the time of fine weather) (T-N) of the amount of loads and about 34 ~ 59% (T-P) were presumed.

(2) Policy settlement of water environmental improvement of the channel

- Goal of the channel environment is defined as “restraint of water bloom caused by eutrophication”. Short term goal is a realization of the goal in specific partial area. Middle term goal is a realization in whole area of the channel.
- With the short-term goal that water quality in the channel should be improved toward the same level as the average water quality of the other waters of the South Lake, a demonstrative experiment is planned for the fiscal year of 2007. In the concrete, experimental equipment for shortening the retention time of water in the channel is to be set to confirm the effect of water quality improvement at a limited area of the channel.
- About realization of a middle goal, harnessing the characteristic (have a processing institution and processing water) which a sewer has for the purpose of controlling generating of AOKO by eutrophication, in the whole middle waterway, we performed cooperation with other-things business, and decided to consider a measure from various angles.

(3) Necessary conditions for purification experiment system

It was examined on purification system for improving channel water environment, discharging way for confirmation of purification, and basic scheme of positive experiment system.

- Considering N/P ratio of water in the channel, filtration system with coagulant removing especially phosphorus is selected for the purification.
- Purification experiment system is designed 100m³/day on scale and rectangular on shape of experimental pond. Detention time is defined 10 days at maximum from viewpoint of algal growth rate, and will be determined by future capability of water induction to the channel for purification and/or fluidizing.

(Future Schedule)

While performing examination about the effect of algae harvesting, or mobilization of water, the program of a demonstrative experiment is scheduled to be fixed within the fiscal year of 2006.

Research funded by Shiga Prefecture

Research person in charge : Nobuyuki Horie, Takashi Masuda and Susumu Kumano

key words

Water purification using vegetation, Improvement of water environment, Super advanced treatment system