Establishing Implementation Procedure of Wastewater Treatment Performance Enhancement Technology

(Research of FY 2017-2021)

1. Purpose

Alternative technology or treatment performance enhancement technology for primary and final settling tanks, and treatment enhancement technology for reactors have been developed to flexibly adapt to decreasing wastewater inflow caused by population decline. Researchers have conducted post-project surveys at the facilities that introduced these technologies and have been trying new R&D.

This study aims to promote the practical application of the treatment performance enhancement technologies and establish the introduction methods of these technologies at the times of retrofit, etc.

2. Outcomes of this year

(1) Treatment performance enhancement of a reactor

Figure 1 is a conceptual drawing of "Dual DO control system for OD process." Researchers studied the operation conditions of two facilities employing this technology. The following outcomes are about one of two facilities.

- During the three years from 2016, treated water had an excellent quality on any of BOD, COD, SS, T-N, and T-P.
- The power consumption of Dual DO control system was 0.230kWh/m^3 per inflow amount in the average for three years. It means the system enabled the reduction of power consumption for aeration and stirring by 50% compared to other trains installed screw-type mixing device for aeration.

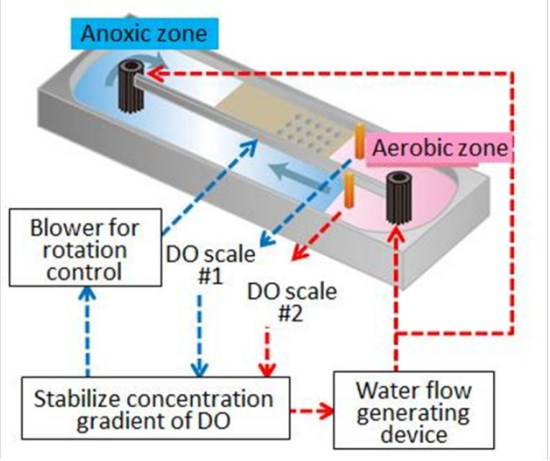

Figure 1: Conceptual drawing of Dual DO control system in OD process

(2) The alternative/performance enhancement technology to the primary settling tank

"Rapid filtration system" has a better SS removability than the conventional primary settling tank. JS has launched joint research on the rapid filtration system with private companies. The year-round pilot plant experiment is scheduled to study the impact that the rapid filtration system may provide to the function of the following wastewater treatment system, which is CAS process and verify the applicability of the system as the alternative or its performance enhancement technology to the primary settling tanks.

(3) The alternative/performance enhancement technology to the final settling tank

"Treatment performance improvement techniques for the final settling tank" aims to enhance the performance of the final settling tank by adding the filtration function. Continued from the last year, real-scale demonstration was conducted in B-DASH Project*.

* B-DASH Project (Breakthrough by Dynamic Approach in Sewage High Technology Project) is a national project that Ministry of Land,

Infrastructure, Transport, and Tourism (MLIT) carries out. The Project aims to accelerate R&D of new technologies and their practical applications, enhance costs reduction in sewage works and the production of renewable energy, and facilitate the global presence of Japanese companies in their water business. In B-DASH Project, all demonstrations are carried out as contract research of National Institute for Land and Infrastructure Management (NILIM.)

3. Future plan

Demonstrations or field surveys relating treatment performance improvement are scheduled to continue after the next year.

- Treatment performance enhancement technique for a reactor: WWTPs that are planning to run the "Dual DO control system for OD process," will be investigated their operational status to compare their performance before and after the adoption of the system.
- The alternative/performance enhancement technology to the primary settling tank: The pilot plant will start running to verify the applicability of the rapid filtration system.
- The alternative/performance enhancement technology to the final settling tank: researchers will continue the verification to stabilize treated water quality by optimizing washing specifications of the filtration part, and improve their maintainability.

Keywords: ***OD Process, Dual DO Control Technology, High-rate Filtration System, Media Filtration***