

Study on the performance of the anaerobic-anoxic-oxic treatment process using media at Egawa water treatment center

Whole term

2002.9~2003.3

(Purpose)

Red tide and blue tide occurred annually as a result of eutrophication despite the enormous effort to improve the water quality. In Kawasaki City, advanced wastewater treatment was permitted to prevent eutrophication in March 1996. The water treatment center promoted the introduction of the advanced wastewater treatment.

Egawa Water Treatment Center adopted a process of anaerobic-anoxic-oxic using media as well focused on the site-reduction.

In this research, the object was to organize an operational manual and design criteria of the anaerobic-anoxic-oxic process using media. And the target BOD, SS, T-N and T-P levels were 10mg/L, 10mg/L, 10mg/L and 0.5mg/L, respectively

(Results)

Data from the steady state and the condition of the floating media were as follows:

1. Effluent concentration of phosphorus in case of rain

When it started raining, effluent concentration of phosphorus became worse after 12 hours. Then it became the steady state 2~3 days after it stopped raining.

2. Water quality

Through this period, BOD, SS and T-N were satisfied with the targeted water quality, however sometimes, the concentration of phosphorus was much higher than the targeted water quality.

3. Flocculant dosage

(1) When raw water went through the whole process, flocculant dosage (PAC) as Al/P ratio, which was required to satisfy the targeted phosphorus concentration, was 0.5 and 1.0 in case of sunny and rainy conditions, respectively.

(2) When 30% of raw water went through only the preliminary settling tank, the targeted phosphorus concentration reached with a daily flocculant dosage as Al/P ratio being 0.25. In case there was high phosphorus concentration in the raw water and there was no flocculant treatment, the effluent water quality was not up to the targeted quality.

(3) The flocculant dosage could be predicted using the data from the tests.

4. Operational skill for complete nitrification.

(1) Complete nitrification made nitrogen removal stable even though the temperature was low.

(2) Nitrogen removal efficiency was over the theoretical rate with various recycle ratios.

5. Condition of the media in the aerobic tank.

(1) In the whole process, concentration of media near the outlet of the reactor was higher than that near the inlet of the reactor.

(2) The media concentration did not depend on the water depth.

Using the results of this study, the design factors and operational manual of the anaerobic-anoxic-oxic process using media in Egawa Water Treatment Center, were prepared.

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Keywords

Simultaneous removal of nitrogen and phosphorus, Use of media, A²O process