

## Study on Effective Combined Sewer Overflow Monitoring Method

Year of Research

2007 • 2008

### (Purpose)

The sewage law enforcement order in Japan was amended in 2003, and water quality standard of combined sewer overflow(CSO) was provided. The water quality test for the overflow was obligated along with the above regal arrangement to confirm compliance with the standard, and the monitoring was required more than once a year. However, the monitoring was time consuming and too much economical burden on the administrator of the sewerage system.

The study aimed to establish more effective method for estimation of BOD<sub>5</sub> by alternative water quality parameters, which can be measured faster and easier than BOD<sub>5</sub> and to effective use of accumulated monitoring data to evaluate performance of the control measures taken for CSO.

### (Results)

#### (1) Efficient monitoring equipment

Installed type of turbid meter and ultraviolet spectrophotometer (UV meter) were employed as equipment for measurement of alternative water quality parameters taking the analysis result of collected data and manufacturer hearing on the measuring equipment into account. They were installed at inflow point of primary sedimentation tank in wastewater treatment plant and measurements were made for eight rain events together with BOD<sub>5</sub> analysis. As a result, it was found that weighted average of BOD<sub>5</sub> value can be estimated by well established equation, which was prepared by measurement of turbid and UV meters for even one rainfall event with wide range of BOD<sub>5</sub> concentration as shown in Figure 1. It was also evaluated that appropriate equipment for overflow chamber would not impose unnecessary troublesome maintenance.

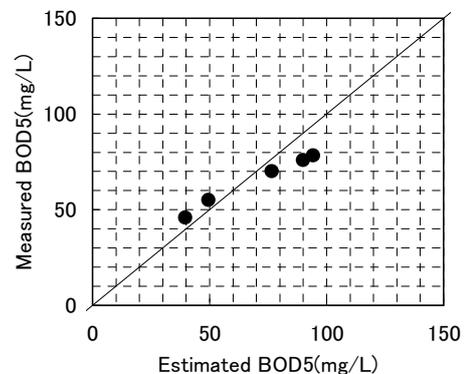


Fig.-1 BOD<sub>5</sub> Estimation Results

In addition, a concrete method to improve monitoring efficiency was proposed based on the findings obtained in this study.

#### (2) Analysis of water quality result in monitoring (analysis of monitoring result)

It was found that average BOD<sub>5</sub> concentration of overflow was high in rain event with small amount of total rainfall and had not much relation with no-rain duration before the event. It was also confirmed that average BOD<sub>5</sub> concentration of overflow became low for diversion chambers with high interceptor ratio of sewage. Categorization of diversion chambers, selection method of monitoring representative for categorized chambers, and evaluation method of control measures for CSO are presented.

The monitoring method would be revised by the findings obtained and accuracy of the analysis is expected to be improved by accumulation of data.

Joint Study: Liaison Conference for Sewerage Technical Development (Cities of Sapporo, Sendai, Saitama, Chiba, Kawasaki, Yokohama, Niigata, Shizuoka, Hamamatsu, Nagoya, Kyoto, Osaka, Sakai, Kobe, Hiroshima, Kitakyushu, Fukuoka, Tokyo Metropolitan Government and Japan Institute of Wastewater Engineering Technology)

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Key words

Combined Sewer Overflow (CSO) Control, Monitoring of CSO, BOD Alternative Indicator