

## Survey study on the pollution load reduction techniques in the large area such as the city etc.

Whole term

1993.10 - 2002.3

### (Purpose)

Neither the outflow organization nor its property is yet analyzed fully on the non-point source (pollution load from zone) from the city area by the rainfall. Thus, it is needed to unduct surveys on the effective reduction measures continuously. The measure for non-point sources is an important issue especially in the closed watershed.

Our organization were constituted "Study group of purification measure of city area drainage" in 1993 year. The survey and analysis of pollution load outflow during storm events at the model areas in four prefectures with the designated lake was examined. The basic issues of effluent load prediction and analysis of actual condition of pollution load outflow during storm events were arranged. Furthermore, "The guide for the non-point load of the city area (the grasp of actual condition and the method of prediction and measure) – March 1998, supervised by the Ministry-of-Construction City-Bureau Sewerage and Sewage Purification Department, Published by Japan Institute of Wastewater Engineering Technology (Foundation)" was published. The author will carry out the evaluation of actual facilities, demonstration experiments, and the survey of pollution load of land utilization for four years from 1998. Moreover, the report will point out issues concerned to plan the measure for reduction of non-point source load, and will adjust as "The guide (proposal) for the measure in the urban non-point area".

### (Results)

In this fiscal year, following 2000 fiscal year, the project setup the procedure composing from the setup of goal of the non-point load reduction, selection of measures, the design of facilities for the measure, and operation and maintenance, based on the survey of condition of the non-point outflow load, the demonstration experiment of measure facilities for non-point source, and the survey results in real facilities. These issues are reflected in a guide (proposal).

#### 1. Survey of Non-point Outflow Load of Land Utilization

To narrow the areas which should be measured generally and to perform efficient measure of the non-point load reduction, the current condition of non-point outflow load by land utilization such as the land use, the road surface or the roof surface, etc was surveyed. The survey during the storm event was conducted in order to check the non-point load which flows out by rainfall. The survey in the fine weather was conducted in order to analyze the absolute quantity of the sediment load (residual load) on the road surface. The contents which became obvious by this survey are shown below.

- 1) It turned out that the road surface outflow load is quite large compared to the load of roof.
- 2) The load of heavy trafficked roads and industrial zones tend to be high, but other areas don't have clear tendency.
- 3) The predetermined relation between the outflow load of storm events and fine weather was not able to be found out in this research.

#### 2. Main Knowledge in Non-point Demonstration Experiment

The knowledge acquired by the past demonstration experiment in each prefecture is listed as follows.

- 1) Although the occurrence of first flush was checked, it was in the range of 1-2 mm or less in the cumulative outflow quantity in many cases.
- 2) The correlation between the water quality items in the outflow rain water was not unusual.
- 3) Although the water quality concentration generally fell gradually after the first flush, the concentration of SS had tendency which follows the rainfall waveform and SS was observed by high concentration with the strong rainfall even if it is after a first flush.
- 4) To predict the annual total outflow load and to check the effect of measures, it is not realistic to observe all the rainfalls. The author verified in this research that the combination model of modified RRL method and PWRI model was nearly identical with the result of survey, and annual evaluation could be performed in this model.

### (Future tasks)

The author summarized past findings as "A guide (proposal) for the measure to the non-point source".

The issue which should be concerned to develop the measure towards load reduction of the non-point source from city area in the future is as follows.

- The treatment and disposal method after flowing into the facilities of non-point measures (examination of the method of return of influent to the treatment plant, disposal methods of sediment in storage tank)
- The operation, maintenance and the employment of methods of the facilities of non-point measures (the way to take in rainfalls, the maintenance, etc.)

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Ibaragi Prefecture, Ciba Prefecture, Nagano Prefecture, Siga Prefecture,  
Person in charge of study: Tsuneto Takaso, Toshiro Tashiro, Hideki Moue, Takashi Tanaka, Syuichi  
Masuoka

Key words

Measure for non-point source, Outflow characteristic of pollution load from non-point source, Method of measure against non-point source