

A Post-Implementation Assessment of the Effectiveness of a Separate Sewer System in Improving River Water Quality

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Abstract

Recent developments recommend the use of SSS to prevent combined sewer overflows and reduce excessive pollutant deposition in the receiving waters; however, other studies also suggest that SSS have minimal or no advantage over CSS in terms of reducing the pollutant loads being discharged in natural waterways. This study was conducted to evaluate the effectiveness of employing SSS in improving the water quality of the rivers in Okcheon-gun, South Korea. The former combined sewer outfalls (CSOs) were monitored to determine the presence of illicit connections or leaks in the newly-established SSS. Dry and wet-day monitoring was conducted alongside the collection of water samples on 14 points along the reach of the rivers and four former CSOs to determine water quality changes and patterns of pollutant loading.

Among the 34 former CSOs in the study area, eight former CSOs exhibited dry-day discharges, implying the possibility of having illicit connections, leaks, or illegal wastewater discharge in the system. Moreover, relatively high biochemical oxygen demand (BOD) chemical oxygen demand (COD) concentrations, ranging from 4.8 mg/L to 24.9 mg/L and 6.4 mg/L to 10.1 mg/L, respectively were observed on three out of the four monitored CSOs. Fluctuations in the pollutant concentrations in the different monitored points along the river was also observed due to the presence of pipes discharging polluted water. Ultimately, further studies are necessary to identify the sources of dry-day discharges in the CSOs to successfully improve the water quality of the rivers in the area.

Keywords : Combined sewer system, separate sewer system, water quality

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