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Evaluating Subdivisions for Identifying Extraneous Flow in Separate Sanitary Sewer Systems

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ABSTRACT

Separate sanitary sewer systems are designed to convey sewage waste from municipal areas to a central treatment facility; they are not designed to handle water associated with precipitation events. However, intercept of groundwater (infiltration) and of flows through manholes or unauthorized connections (inflows) introduces rainwater into the sanitary sewer system. Infiltration/Inflow (I/I) increases the costs associated with treatment and can create additional environmental problems. Identifying and quantifying the volume I/I can be complicated and costly. A simple quantitative method was developed to quantify the extent of I/I occurring in sewer sheds. The method uses measured sewer flows, water usage, precipitation values, and land cover data to calculate the volume of extraneous flows. To assess its utility, the method was used to compare two urban sewer sheds, Holiday Knolls and Eagle View. Both sewer sheds showed evidence of I/I in excess of 200 gallons per day per inch-mile of sewer pipe (gpd/in-mile). Holiday Knolls, the older subdivision had an average I/I of 1912 gpd/in-mile, while Eagle View had an average of 1143 gpd/in-mile. The developed method provided simple means to calculate I/I and to identify sewer sheds in need of repair.

KEYWORDS

Sanitary Sewers; Inflow; Infiltration; Modeling

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