



Evolution of the Gravity Separator

Background – Standard sump manholes have been used to collect sediment in sewer systems for decades. However, the effectiveness of standard sump manholes has been assumed to be marginal, and several proprietary products have been developed that claim to increase removal efficiencies, reduce scour, or both.¹

The Historic Focus on Increasing Removal Efficiencies – The primary focus of gravity separator design has historically been to provide high removal efficiencies, with little or no thought to sediment retention during large storms. Recent third party studies verify that proprietary systems can provide increased removal efficiencies, typically by swirling water which increases particle travel paths and consequently results in increased removal efficiencies.

The Paradigm Shift – The third party testing also showed that flow swirling has the negative effect of creating vortices during high flows, which greatly increases scour. Comparison of the test results has revealed that scour is a more important factor than removal efficiency when computing a treatment device's annualized removal efficiency. Essentially, the effectiveness of a structure is diminished if it is not designed to retain previously settled solids during high flows.

Devices That Nearly Got It Right – Devices that use a false floor or skirt are effective at suppressing scour, but create an obstruction for routine inspection and maintenance. These systems are also not retrofittable and are restricted for use in circular manholes only.

Baffles currently on the market are difficult to design/install when there are multiple inlets or small angles between pipes, their center installation impedes access/maintenance, and they have not been designed or tested to work in tandem with skimmers.

The Preserver™ – The Preserver™ is the next generation gravity separator because it is retrofittable, reduces costs without sacrificing quality, is easy to ship and easy to install, includes skimming, and retains previously captured sediment without sacrificing space for ease of inspection and maintenance.

¹ Removal of settleable solids typically occurs during relatively low flow rates. Scour of previously settled solids typically occurs during relatively high flow rates. Scour is the process of high flows transferring sufficient energy to previously settled particles such that they are resuspended in the water column and subsequently washed out of the structure and downstream.