

Storm King for Blending

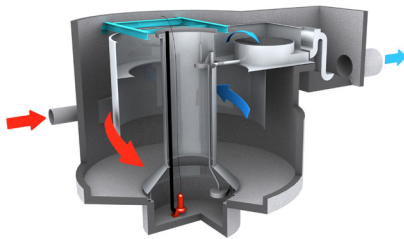
Increase Efficiency by Removing Abrasive Grit & Reduce Deposition

Wet Weather Application Sheet

Highlights

The Storm King® process offers:

- Multiple processes in one basin
- Consistent effluent quality
 - absorbs shock loadings
- Self-activating
- Rapid start up
- Non-mechanical
 - no moving parts
- Small footprint
 - reduced construction cost



Overview

In a pivotal 2013 opinion*, the 8th Circuit Court vacated the Environmental Protection Agency's (EPA) across-the-board prohibitions on the use of mixing zones for primary contact in recreational waters and "blending" for peak wet weather flows.

Blending refers to the process of rerouting excess wet weather flows around a wastewater treatment plant's secondary biological treatment process and then mixing the partially treated excess wastewater with the treated wastewater prior to discharge into the receiving waters. The partially treated excess wastewater undergoes primary treatment before being rerouted around the secondary biological treatment process. Both streams are typically disinfected. The two streams are recombined prior to discharge and are still subject to water quality standards for its effluent. All end-of-pipe discharges that enter navigable waterways must meet permitted standards. Blending is implemented nationwide as a means of treating wet weather flows and is applicable in all communities, not just CSO communities.

The court found that application of effluent limitations to internal treatment points is beyond the statutory authority of the EPA, which is limited to promulgation of limitations for "discharges of pollutants from a point source." Where blending has been utilized in the industry, the regulated entity is still subject to water quality standards for its effluent that apply to the end-of-pipe discharge that enters the navigable waterway. Entities that have relied upon blending technology in their facilities or mixing zones in primary contact waters to meet water quality standards cannot be prohibited from their use without notice and comment.

Blending presents an opportunity for Hydro International's Storm King® process. The Storm King® process is a screen, grit removal system and primary treatment system all in one. Disinfection can be added within the same vessel, providing all four processes in a single non-mechanical, self-activating basin that reduces chemical usage and operational costs and can be built at half the cost and one-tenth the footprint of conventional approaches.

Another benefit to utilizing the Storm King® process in a blending application is that an upgrade to the headworks and primary treatment system is not needed as the technology incorporates all of the processes for blending into a single basin (i.e. screening, degritting, primary clarification equivalency and disinfection). A coarse 1-3" screen upstream is also recommended to remove for removal of coarse solids. Additionally, a costly expansion to the secondary treatment processes may also be avoided.

In addition to the above the Storm King® separator offers process advantages over the below commonly used alternatives in a smaller footprint which reduces space requirements and can significantly reduce construction costs.

Vs. Primary Sedimentation Tank	Vs. Sedimentation followed by Conventional Chlorination**
Equivalent TSS & COD removal at 4-5 times higher loading rate	2-3 times higher TSS & COD removal at a higher loading rate
More effective TSS removal	2-3 times higher disinfection efficiency
Less sensitive to flow variations	Better chlorine use, 77% chlorine consumption vs. 46%
No flush out of solids at high flows	Lower concentration and contact time, mg/L/min.
	No flush out of solids at high flows

* Iowa League of Cities. Eighth Circuit. 13 Nov. 2013.

** Ghosh, D.R., Boner, M.C., Atere-Roberts, S.O., Street, W.B., Haas, D.L., and Arnett, C.J. (1992) Treatment of the combined sewer overflows in the Chattahoochee River. CSO Demonstration Day. WPCF Research Foundation. Columbus Chamber of Congress, Columbus, Georgia. November 6th 1992.