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## Combined Sewer Overflows – Better by Design

**CSO screens play a vital role in meeting European environmental regulations, and despite the UK leaving the EU, their design will continue to be of paramount importance**

The Urban Wastewater Treatment (England and Wales) Regulations 1994, Regulation 6 (2) places a duty on the Environment Agency to ensure polluting overflows are limited while also recognising that it is impractical to construct wastewater treatment facilities to treat all wastewater entering the system.

The framework for consenting intermittent discharges requires water companies to design, construct and maintain sewer networks with the best technical knowledge without excessive costs, however, the question of what

## The Talk: opinion

constitutes ‘excessive cost’ differs from regulator to operator.

Effectively, CSOs must be provided with ‘primary treatment’, defined in the regulations as ‘water treated by a physical and/or chemical process involving settlement of suspended solids, or other processes in which the BOD<sub>5</sub> of the incoming wastewater is reduced by at least 20% before discharge and the total suspended solids of the incoming wastewater are reduced by at least 50%’

Most member countries use screens to meet the regulations, while in the UK the requirements for solids separation depend on the level of amenity and the number of spills per year.

CSO screens of various designs have been installed since the regulations were introduced, including perforated plate/wedge wire static screens fitted in many locations where expected spills do not exceed 5 per annum, on the basis that these screens would be inspected and cleaned at least once per year. A range of mechanical screens have also been installed where spill frequencies are higher, supplied in various designs from 4 mm Raked Bar Screens (approved as 6 mm equivalent), Brush Screens,

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wedge wire and perforated plate, all automatically cleaned by various methods. Many of these have now been in service for 15 to 20 years with minimal maintenance, and are probably due for serious maintenance, servicing or replacement over the coming five years, something that water companies need to factor into their future workload.

The UK has decided to leave the EU, but intends to transfer EU regulations into UK law en masse, so the regulations outlined above are unlikely to change in the foreseeable future. It is anticipated that for new CSO schemes the use of 4mm raked bar screens and 6mm aperture

screens will continue, as it seems unlikely that the UK government will continue to improve the environmental standards that the EU legislation has imposed.

The technology is available to further improve the quality of CSO discharges, such as vortex, settlement or filtration of discharges, but the government is not likely to increase the burden upon the public to pay for this.

Many of the sewerage systems in the UK are combined and the majority of CSOs are sited where hydraulic problems occurred, often being no more than pressure relief pipes for the system. However, the aesthetic appearance of many watercourses deteriorated forcing the government to set limits of discharge. In addition, good practice dictated that the overflow chamber should be designed to minimise the deposition of solids into the environment by the use of baffles.

CSOs are essential safety features for the sewerage network and screen technology design and performance have developed significantly as a result of experiences gained from operating these assets.