



Background Briefing
September 2009

Combined Sewer Overflows

In recent months special interest groups have raised questions about the design and implementation of public policy on an aspect of wastewater management in the UK – the use of combined sewer overflows (CSOs). The issue has also been covered by the media notably BBC Radio 4 (1) and The Sunday Times (2).

Here Water UK provides summaries of:

- 1) Purpose and operation
- 2) Regulation
- 3) Future strategy
- 4) Water industry campaigns

1) Purpose and operation

CSOs are a design necessity in many combined sewer systems to ensure that any excess flow is discharged in a controlled way and at specified and managed locations.

1.1 Purpose

There are three types of sewerage systems:

Foul sewers

Foul sewers carry flows resulting from business and domestic water use, for example kitchen and bathroom waste, to a wastewater (sewage) treatment works. Treated effluent is then discharged to the environment (a local water course or the sea) under a consent granted by the environment agencies.

Surface water sewers

Surface water sewers carry rainwater to a suitable discharge point such as a local watercourse or the sea. These discharges do not generally require treatment or a licence from the environment agencies.

Combined sewers

Combined sewers carry business and domestic wastewater and rainfall in the same pipes to a local wastewater treatment works for treatment prior to discharge. Houses built since the mid-1960s generally have separate systems, while those built before tend to have combined systems.

1.2 Operation

Combined sewers are responsive to rainfall. The heavier the rain, the greater the flow the sewer has to carry. It is inevitable in heavy rainfall or equivalent weather events that some of these sewers will be overwhelmed. The overloading, if not relieved by CSOs, would lead to storm sewage flooding homes, gardens, streets, highways and open spaces.

CSOs are therefore essential structures in many combined sewer systems. When the system is full, they act as release valves designed to carry any excess flow by underground pipes to an outfall point, often a local watercourse. The discharge from the CSO is substantially diluted by rainwater and joins a watercourse swollen by rainfall.

Intense storms or wet weather persisting over a long period of time makes the system particularly vulnerable. July 2009 was the wettest since 1888 in England and Wales so it is no surprise that CSOs were needed on an above-average number of occasions.

CSOs are a design necessity in combined sewer systems to ensure that any excess flow takes place in a controlled way and at specified and managed locations.

2) Regulation

CSOs owned and operated by water companies in the UK are regulated by the Environment Agency (EA) in England and Wales, the Scottish Environment Protection Agency (SEPA) and the Northern Ireland Environment Agency (NIEA).

2.1 Consents to discharge

The environment agencies issue consents to water companies which allow them to discharge from CSOs subject to defined conditions. The consent specifies that discharges are allowed only as a result of rainfall or snow melt. CSO consents are part of the public register maintained by the agencies.

The correct flow specified in the consent must be passing forward for treatment before any discharge from the CSO will occur. The operation and performance of CSOs are monitored jointly by the agencies and water companies as part of an environment improvement programme in accordance with government policy and implementation of the European Urban Waste Water Treatment and Bathing Water Directives.

The shared objective has been, and remains, to ensure the minimum possible impact on the water environment while protecting public health and well-being. This extends to keeping the overall policy under joint review in the light of legal requirements and community expectations.

In England and Wales, when the water and sewerage companies were privatised in 1989, new temporary consents were issued for many previously unconsented CSOs bringing them within the regulatory framework.

2.2 Priorities and improvements

Since 1989, the companies have worked with the EA to identify and tackle CSOs deemed to have unacceptable impacts on the environment. Those that needed improvement were dealt with through major investment by the companies. By the end of 2008 more than 6000 overflows posing the highest risk had been improved, rebuilt or removed altogether.

Another 4000+ CSOs, were identified as posing little risk to the environment and remained subject to the temporary consents. Either there was little or no chance of them causing pollution (because of their nature and location) or they were only used very infrequently and in the most extreme circumstances. The low risk involved meant that these CSOs could be given lower priority than other, more pressing, wastewater problems caused by decades of under-investment.

CSO improvement is one aspect of a major programme of improvement in the national wastewater system begun at privatisation. By 2010 the companies will have invested some £80 billion in total, more than half in wastewater.

The benefits speak for themselves in significantly better water quality in rivers and bathing waters. For example, 76% of English rivers are now of 'very good' or 'good' quality, up from 55% in 1990; bathing waters reaching guideline standards have increased from 37% in 1999 to 65% (Environment Agency). Keep Britain Tidy makes annual Blue Flag beach awards to beaches that have achieved the highest quality in bathing water, safety, environmental education and management. In 2000, 24 beaches in England earned Blue Flag status: by 2008 this had increased to 82.

2.3 Extending regulation

Recently, recreational and other interest groups have drawn attention to the low-risk CSOs subject to temporary consents and made allegations in the media about the potential risks they pose to, among others, surfers in a small number of coastal locations. Without accepting these allegations, in April the EA issued 'blanket' consents for these discharges bringing them under additional regulatory controls.

The industry agrees with the EA that it is time to deal with this long standing issue and has worked with EA officials to devise a workable process and legal standards.

However it is concerned that the agency has been hasty in imposing the new arrangements. The 'blanket' standards are not consistent with the system in place for existing regulated CSOs, notably because they apply to receiving waters rather than the discharge itself; this is seen as poor regulation likely to cause confusion because receiving waters are subject to impacts for other sources.

For this reason some companies are appealing against the new standards and hope that the outcome of their appeals will be a more appropriate regulatory framework.

In Scotland Scottish Water has been working with SEPA to develop solutions. Northern Ireland Water has a programme agreed with the NI Environment Agency to improve sewerage systems and overflows.

2.4 Removing all CSOs is unrealistic

It might be thought that the way forward would be to completely 'design out' impacts on the environment from occasional spills by removing all CSOs. However such a step is not viable for practical and cost reasons. It would mean either:

- a) separating all foul and surface water sewers – this is simply so huge a project as to be unrealistic in terms of both cost and disruption; or
- b) building large amounts of new storm storage – this would come only at huge cost to customers, would require extensive environmental planning, and the assets created would be unused most of the time.

The water industry encourages urban planners to consider carefully how surface water is dealt with. It is supporting development of sustainable urban drainage systems (SUDS) which can treat or reduce the flow of surface water and at the same time provide environmental improvement in respect of landscape and biodiversity (see 3.2 below). At the same time companies are continuing to invest to improve their knowledge of the operation of sewerage systems through modelling studies and telemetry. All this work will help reduce the frequency of discharges from CSOs.

3) Future strategy

Water companies and regulators are committed to a continued programme of improvement to unsatisfactory CSOs.

3.1 Industry planning for continued investment

In their future business plans the water and sewerage companies are proposing to press ahead with further improvements requiring significant new capital expenditure. The economic regulator Ofwat has provisionally agreed that between 2010 and 2015 the companies should invest more than £1 billion “to limit pollution from combined sewers and emergency overflows and storm tanks”.

In Scotland the Water Industry Commission proposes expenditure over the next 5 years of over £200 million most of which relates to improvements in Glasgow and to west coast bathing waters.

3.2 Forthcoming legislation

The planned Flood and Water Management Bill and the Flood Risk Management (Scotland) Bill will focus on improving surface water management by reducing the amount of surface water and highway run-off that enters sewers. If this is achieved, the number of occasions CSOs are needed to deal with excess flows will also be reduced.

One of the most encouraging developments in the Flood and Water Management Bill is the introduction of Sustainable Urban Drainage Systems (SUDS) already growing in use in Scotland. SUDS use natural systems such as ponds and filter strips that treat the surface water before it discharges to streams and rivers. SUDS can be used to reduce risk of flooding downstream by holding up the flow of surface water as well as cleaning it.

4) Water industry campaigns

Water industry led campaigns aimed at reducing sewage related debris and using the sewer network properly include:

Water UK: [Bag It and Bin It](#)
[Disposal of Fats, Oils, Grease and food Waste](#)

Anglian Water: [Sewerwise](#)
[Towns joint fight against fat attack](#)

Dwr Cymru Welsh Water: [The Dirty Dozen](#)

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Thames Water: [Bin It Don't Block It](#)

United Utilities: [Flushed Away](#)

Advice for domestic customers: [How to dispose of your waste responsibly, avoid blocked drains and the flooding of your home](#)

(1) [BBC Radio 4 Costing the Earth - 7 May 2009](#)

(2) [The Sunday Times - 28 June 2009](#)

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