



South Staffs Water

Customer Challenge Group

Briefing Note 3:
Leakage



1. What Is Leakage?

When we talk about leakage, we are referring to the loss of treated water from the underground pipe network, which includes our water mains and customer service pipes. Leaks can occur through holes or splits in pipes, or from joints and fittings. These types of leaks can either be visible, and may be reported to us, or are hidden, not showing on the ground surface, and need to be located. Of these, there can be a large number of very small leaks that individually are not practical to locate, and these are collectively known as 'background leakage.'

2. What Causes Leaks?

There are a number of factors that can lead to leaks from underground pipes. Ground movement, which creates stress and can damage pipes and joints, is a major cause and can be due to traffic loading or the weather. The impact of weather on underground pipes is significant, particularly in the winter period following freezing and thawing of the soil, which causes the ground to expand and contract, putting stress on pipes.

The pipe network is pressurised as part of the process used to pump the water to our customers. Excessive high pressure can cause the pipes, fittings and joints to fail and leak.

Underground water pipe networks are expected to last for many decades, and more than a century in some cases. However, over time a pipe can become weaker due to corrosion. This can lead to small leaks if tiny holes form, or can weaken the structure of the pipe resulting in it being more prone to failure due to high pressure or ground movement.

3. How Much Water Is Lost?

On average, up to 74 Ml/d (million litres per day) is lost through leakage across the underground pipe network, which equates to about 20 Olympic size swimming pools every day. We carry out around 7,500 repairs each year in order to manage leakage to this level. Of these repairs, approximately 50% are reported (often visible at the surface) and the other 50% are where we have to detect hidden underground leaks.

If we did not carry out active leakage management on the pipe network, it has been assessed that leakage levels could increase by around 50% (i.e. by some 35 Ml/d over a year), which would clearly be unacceptable both to customers and the company from a water resource management perspective.

We are responsible for the water mains, but not the customers' part of their own service pipes, which make up the complete underground pipe network. We include leaks from these underground customer pipes in the total level of leakage we report annually to Ofwat and the Environment Agency, even though we do not have direct responsibility or control over these customer pipes. Leaks from customer underground pipes are assessed at around 30% of the total level of leakage.



4. How We Manage Leakage

In addition to repairing those visible leaks that can be clearly seen on the ground surface, we have well-developed strategies to manage the significant level of hidden underground leaks.

The underground water pipe network is divided into over 500 discrete sections known as District Metered Areas (DMAs). These DMAs currently provide the

underground pipe network which supplies over 98% of our customers, and allow us to measure the flow and thereby assess leakage in these well defined and managed areas. These are essential tools to enable us to prioritise our efforts in managing leakage, and to be effective in targeting the right areas of the pipe network.



By monitoring the DMAs over time, we can focus efforts in an efficient manner in a number of areas to manage leakage:

- **Active Leakage Control (ALC)** – our staff target DMAs on a prioritised basis using a variety of techniques and technologies to find hidden leaks on buried pipes. Most of the methods rely on listening for the noise generated by the leaks.
- **Repairs** – we manage the speed and quality of repairs once leaks are identified, as this helps to reduce the overall level of leakage.
- **Pressure Management** – where there is scope to manage excessive pressures in the pipe network we install equipment to do this. This helps us manage leakage, and can also extend the life of the pipe network. We currently have over 300 operational pressure reducing valves on the network.
- **Asset Management** – we have a long term strategy for mains renewal, which plays a part in replacing those sections of the network that are most prone to failure.



5. Leakage Economics & Target Setting

Leakage targets are set by Ofwat, the water industry regulator, based on economics which result in the best value for customers.

Water lost through leakage has a value. There is a cost associated with abstracting and treating water so it is safe to drink. There are also energy costs associated with pumping it to customers. In addition to these direct costs to the company, there are also external costs faced by society and the environment in general. These include social impacts due to such things as traffic delays to the general public due to leak detection and repair works in the highway, and environmental costs such as lower river levels potentially caused by over abstraction of sensitive water resources.

Managing leakage also costs us money, through locating and repairing leaks and carrying out pressure management. When leakage is high on an underground pipe network it is relatively easier to find and repair, resulting in larger leakage savings. However, when leakage on the pipe network is relatively low, it is harder to find, resulting in smaller savings.

We manage leaks to the level that produces the lowest overall cost in terms of leakage management activities and the cost of the water lost. This point offers the best value for money for our customers. This point is known as the Economic Level of Leakage (ELL), and when this also includes the indirect social and environmental costs it is known as the Sustainable Economic Level of Leakage (SELL). The SELL is used to establish regulatory leakage targets with Ofwat and the Environment Agency.

If we allowed leakage to rise above the SELL, the additional cost of abstracting, treating and distributing water to customers would be greater than the cost of managing the leaks. If we were to reduce leakage below the SELL, the cost of managing the leakage reduction would be greater than the value of the water saved.

Operating at the SELL should mean that the total cost to the customer of supplying water is minimised and the water company is operating efficiently.

6. Future Proposals for Change On Regulating Leakage

Ofwat, the Environment Agency and Defra have recently carried out work in conjunction with water companies, to review the calculation of the SELL and its integration with water resources management planning. This has resulted in a proposed change from the current spot target approach with a possible option of a banded target, with a leakage range to support improved innovation while taking account of assessed risk, operational, climatic or supply/demand conditions, including impacts from periods of extreme weather. This proposal may be introduced as part of the PR14 periodic review process and would need customer engagement to establish an appropriate target range.



Glossary

ALC – Active Leakage Control.

AMP6 – Asset management plan for the 6th period since privatisation: 2015-20.

CRoW – Countryside and Rights of Way Act (2000).

Defra – Department for Environment, Food and Rural Affairs

Deployable output – The amount of water available to us to supply to customers.

DMA – District Metered Areas.

dWRMP – Draft Water Resources Management Plan.

EA – Environment Agency.

ELL – Economic Level of Leakage.

FBP – Final Business Plan.

fWRMP – Final Water Resources Management Plan.

Headroom – An amount of water added to allow for uncertainty in various elements of supply/demand forecasts.

HWBD – Habitats and Wild Birds Directive.

Measured charges – Water bills charged by way of water registered through a meter.

MI/d – Million litres per day.

NEP – National Environment Programme.

Ofwat – Water Services Regulation Authority.

PCC – Per Capita Consumption.

PR14 – Price review undertaken in 2014 for 2015-20 period.

RBMP – River Basin Management Plan.

SAC – Special Areas of Conservation.

SELL – Sustainable Economic Level of Leakage.

SPA – Special Protection Area.

SSSI – Site of Special Scientific Interest.

TUB – Temporary Use Ban.

Unmeasured charges – Water bills charged by way of rateable value.

Volumetric charge – Same as measured charge.

WAFU – Water Available For Use.

WFD – Water Framework Directive.

WIA – Water Industry Act (1991).

WRA – Water Resources Act (1991).

WRMP – Water Resources Management Plan.

