Contamination and Protection of Water Supplies

Water is essential for humans to live and function and is therefore used for many different activities. As a Water Undertaker, SES Water has a responsibility to provide clean, safe (wholesome) water for their customers to consume and use.

The properties of water

Water has many useful properties, including: a high heat capacity, capillary action and excellent solvent properties. Due to this it has multiple everyday uses, whether it is for domestic purposes such as drinking, cooking and bathing or non-domestic uses, including industrial processes, arable and livestock farming, or construction.

All uses of water will lead to it becoming contaminated to various degrees, ranging from a change in temperature to contamination by chemicals (such as pesticides and insecticides) or microbiological contamination by bacteria and viruses.

Once the water has become contaminated it will have a detrimental effect on human health. Therefore, it is essential that this contaminated water does not enter back in to the wider water network.

The cause of water contamination

Contaminated water enters the network usually by backflow. This is caused by:

1) **Back pressure** - This is when a high pressure in a water system forces water back into the network. This can be caused by a pump or the thermal expansion of water.
2) **Back siphonage** - This is when the network pressure is lower than the water system, causing water to siphon back into the network. This could be caused by a burst water main or a temporary depressurisation due to the fire brigade using a high volume of water from the network.

Fluid Categories

Water is classified into five fluid categories (FC). This is done to identify the level of contamination that could be caused. This ranges from FC 1 being wholesome water to FC 5 that is the highest level of contamination.

Fluid Category 1
Wholesome water supplied by a water undertaker and complying with the requirements of regulations made under section 67 of the Water Industry Act 1991.

This is the water within SES Water's main network.

Fluid Category 2
Water whose aesthetic quality has been impaired due to a change in temperature or the presence of a substance or organism causing a change in taste, odour or appearance.

Examples include mixing of hot and cold water supplies, domestic water softeners (with common salt regeneration) and ice making machines.

Fluid Category 3
A fluid containing substances of a low toxicity that will be a slight health hazard.

Examples include water in domestic heating systems, domestic washing machines, dishwashers, hand basins, baths and showers. Commercial softening plants (with common salt regeneration) and drinks vending machines where ingredients or carbon dioxide are injected.

Fluid Category 4
A fluid containing toxic substances that will cause a significant health hazard including chemicals, pesticides, carcinogens and environmental organisms.

Examples include, commercial heating systems, dairies, commercial dishwashing and clothes washing, printing and photographic equipment and dyeing equipment.

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Email: waterregulations@seswater.co.uk

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Fluid Category 5
A fluid causing a serious health hazard due to the concentration of pathogenic organisms, radioactive or very toxic substances. This includes faecal matter or other human waste, butchery / animal waste and pathogens.

Examples include, non-domestic hose union taps, sinks, urinals, WC pans and bidets, permeable pipes laid at ground level or below ground. Grey water recycling systems, medical equipment with submerged inlets, laboratories, health care premises clothes and dish washing. Insecticide or fertiliser applications, livestock fields and abattoirs.

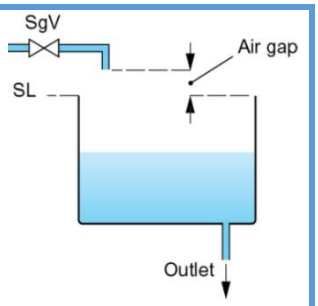
Methods of protecting water supplies

As the contamination risk through the fluid categories increases, a more stringent backflow prevention device is required to protect the water network. Mechanical devices can fail and allow backflow, Fluid Category 5 risks require a physical air gap to remove the risk altogether.

Fluid Category 2 An example of backflow protection for this category is a single check valve (right).	

Fluid Category 3 An example of backflow protection for this category is a double check valve (right).	

Fluid Category 4 An example of backflow protection for this category is a RPZ valve (right).	

Fluid Category 5 An example of backflow protection for this category is a Fluid Category 5 Break Cistern (the image to the right shows a Type AA air gap).	

SES Water's responsibilities

As a Water Undertaker SES Water has a legal duty to ensure the water within the network stays wholesome to protect their customers' health (Section 68 of The Water Industry Act 1991).

The Water Supply (Water Fittings) Regulations 1999 have been established to enable Water Undertakers to enforce these regulations and ensure the appropriate backflow protection for each fluid category is in place to protect the water quality in their network.

Any individual found to contravene these regulations can face prosecution.

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