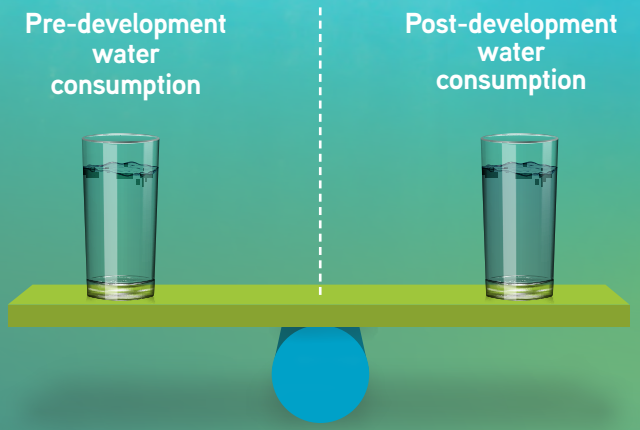
Water Neutrality

PJA

Water is essential for everything we know and do and is under growing pressure from our ever-changing climate. 'Water Neutrality' considers the whole life cycle of water, focusing on specific uses to create the ultimate balance between supply and demand within future development.



What is Water Neutrality?

Water Neutrality focuses on reducing development's water footprint. A new development should achieve the same water demand (or better) as the existing use of the site to ensure there is no additional strain on water supply in the area.

How do we achieve Water Neutrality?

'Water Neutral' reduces the water footprint of an activity as much as possible and offsets the negative balance of the remaining water by using a tiered approach.

Water Neutrality Steps

STEP 1 — WATER REDUCTION

Water Efficient Devices, Smart Metering, Water Saving Culture.

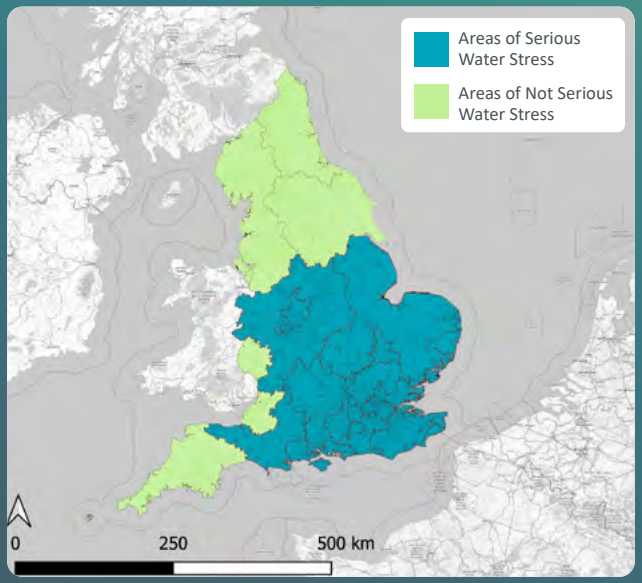
STEP 2 — WATER RE-USE

Rainwater Harvesting, Greywater Harvesting, Blackwater Harvesting

STEP 3 — WATER OFFSET

Purchase credits to balance the offset in water use from the development

Water use in the UK



Types of water

Potable Water - Water suitable for drinking (taps/showers/bath)

Rainwater - Clean water but not suitable for drinking without treatment

Grey Water - relatively clean waste water from baths, sinks, washing machines, and other kitchen appliances

Black Water - Waste water and sewage

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Facts about neutrality

- New development in a sensitive area requires an assessment of the existing and future water demand.
- Water reduction and harvesting options have varying levels of cost / benefit
- Cost of potable water in the UK is very low, reducing the cost incentive for harvesting
- Offset options (via credits and retrofit works) are limited and challenging to implement

Facts about water use in the UK

- The UK population is 68.7 million people, with over 50% located in a water stressed area
- UK water demand is estimated to be approximately 15 billion litres per day
- Approximately one third of tap water in England and Wales comes from underground sources (aquifers). The rest comes from reservoirs, lakes, and rivers. Namely, surface water in the UK accounts for 68% and mixed sources for 4% of the supply.
- Leakage rate in public infrastructure is approximately 20%, equivalent to leakage of approximately 3 billion litres per day. This is equivalent to water supply of approximately 20 million homes that is lost daily.
- Projected population growth indicates demand is expected to exceed supply by up to 3.1 billion litres per day by the 2050s.
- Climate change has affected UK rainfall patterns, with increasing warm and dry spells and increasing periods of heavy rain and storms.
- Changing weather patterns due to climate change is having a significant impact on groundwater recharge rates, which resupply the UK aquifers.

The Water Authority Approach

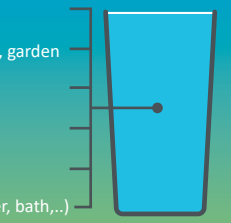
- Water Authorities have outlined action plans (under Ofwat Guidance) for each Water Resource Zone (WRZ) to improve the supply of water to stressed regions and throughout the UK.
- All water authorities have committed to a reduction in leaks within their network, with plans in place to significantly reduce water loss by 2050.
- Population growth and new development indicates that there will be an increased demand that exceeds supply even with the predicted repairs in place.
- Initial estimates indicate that supply in the UK can only be maintained if water use per person is reduced to at least 110 litres per person per day.

Reduction through development

Balancing the increased capital cost against decreased bills, maintenance, and overall water use to ensure future supply

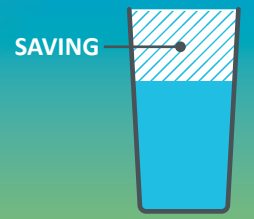
TYPICAL CONSUMPTION - 140 l/person/day

- Standard use with no water saving measures



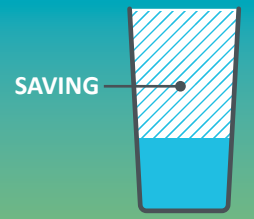
REDUCED CONSUMPTION - ~110 l/person/day

- Water saving fittings / appliances are a low-cost and high benefit solution to water reduction
- Rainwater harvesting for car washing and garden irrigation can reduce overall water demand
- Improved water culture / education can ensure people use water wisely.



MINIMAL CONSUMPTION - ~80 l/person/day

- Grey water harvesting has a medium cost but provides no benefit in small residential schemes. Benefit increases as the scheme increases in size and use.
- Harvesting for potable water has high upfront cost and typically has insufficient yield compared to provide any significant benefit.
- Black water harvesting has a high upfront cost with medium benefit in water reduction but does reduce wastewater from site.
- These elements should be included as part of a complete and cohesive water reduction /recycling system and a strong water saving culture



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