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Running out or flooded out?

London's water crisis

June 2019 · Leonie Cooper AM

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Executive summary

Water is essential for our city to function. However, London's growing population and aging pipes, combined with a changing and increasingly extreme climate, means that our water resources are under growing pressure. We all remember the Beast from the East in 2018, and the flooding and water outages that arose as a result of pipes freezing, thawing and bursting. Similarly, we are having increasingly dry summers and unexpected heatwaves, meaning that we cannot continue to rely on rainwater to replenish water stocks.

We simply cannot afford to wait before taking necessary action. Water shortages are far more likely than people might expect: the Environment Agency has warned that within just 25 years, the South East of England could run out of water.[1] Further, the cost of a severe drought to London's economy is estimated by Thames Water to be £330m per day, and would have severe economic, social and environmental consequences.[2]

On the other side, the Mayor's Risk Register ranks flooding as one of the highest risks, both in terms of likelihood and the level of damaging impact. The Thames Barrier, London's leading flood defence, protects over £200bn worth of property, including iconic landmarks such as the Houses of Parliament.[3]

Key findings

- A total of 25% of the water put into Thames Water's network is lost through leaks from pipes.
- There have been over 26,000 burst pipes in London between 2015 and the end of February 2019. Within two months of 2019, London has seen a fifth of the burst pipes it saw in 2018, and a quarter of those seen in 2015. Whilst more likely during the winter months, this is still a concerning figure.
- London's water crisis is being exacerbated by the climate crisis.
- Construction on the proposed reservoir in Abingdon, Oxfordshire, which would create extra storage for millions of litres of water for London, must be accelerated to 2035, two years sooner than proposed. This would help to avoid a water crisis in London.

Image 1: River flooding in Richmond

Recommendations

Recommendation 1: The Mayor should put pressure on water companies to protect and invest in London's water supply

- The Mayor should lobby water companies and OfWat to work effectively together to ensure a higher level of investment in water supply infrastructure, to enable water companies to meet leakage reduction targets while providing a good and affordable service.
- The Mayor should support the National Infrastructure Commission's call for water suppliers in London to cut leaks from their system by 50% by 2050, and lobby OfWat to set and monitor ambitious interim targets to ensure progress.
- The Mayor should work with water companies to roll out a water efficiency retrofitting pilot and water meter installation programme across London.
- The Mayor should support sustainable water management in London by convening a working group with key stakeholders to develop and implement joint action plans on leaks, sustainable drainage, and customer communication.

Recommendation 2: The Mayor should collaborate with water companies in London to conduct an awareness raising campaign to help Londoners save water.

- The Mayor should partner with the 'Water Label' to promote the scheme to Londoners.
- The Mayor should lobby producers to sign up to the scheme and link with built environment, procurement and water efficiency initiatives.
- The Mayor should include 'water footprints' in his awareness raising campaign, to help reduce water consumption.

Recommendation 3: The Mayor should encourage water efficiency in London's buildings

- TfL and other GLA bodies should conduct an assessment of the water efficiency of their buildings and retrofit water-saving devices and greywater recycling, where not already installed.
- The Mayor should require developers to select the most water efficient appliances for inclusion in new developments and install greywater recycling.

Recommendation 4: The Mayor should plan for London's future water supply

- The Mayor should call upon OfWat and the Environment Agency to grant permission at an early stage for the Abingdon Reservoir construction, and Thames and Affinity Water to construct the Abingdon Reservoir as soon as is practicable, with completion no later than 2037.
- The Mayor should lobby the Government to conduct an assessment of the costs and benefits of bringing forward the construction of a new Thames Barrier to protect Londoners against faster than anticipated sea level rises.

London's water industry

Thames Water is London's main water supplier but is one of four main companies across the city. Each supplier also supports areas outside of London – for example Thames Water's catchment area extends as far as Oxford (see figure 1). As well as Thames Water, parts of London are also supplied by Affinity Water, Essex & Suffolk (part of Northumbrian Water) and Sutton & East Surrey Water.[4]

In addition, water companies provide wastewater supplies and are responsible for London's sewers. They play an important role in reducing surface water flood risk and improving water quality through sustainable drainage installation.

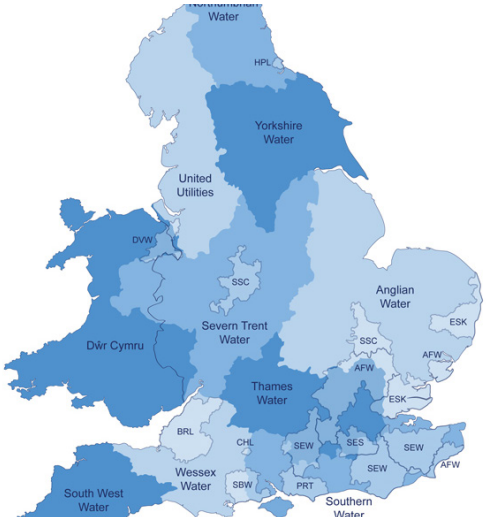

Figure 1: Map of England and Wales' water suppliers. Source: Ofwat

The structure of London's water industry is further complicated by the roles and responsibilities of a number of other organisations:

- The Department for the Environment, Food and Rural Affairs (DEFRA) set the overall strategic policy framework;
- OfWat regulate the water service providers;
- The Environment Agency has responsbility for maintaining waterways and responding to flood risks;
- Public Health England is responsible for protecting the public from health hazards, including those caused by drought and extreme heat;
- The 33 London boroughs are the Lead Local Flood Authorities with respect to surface water and groundwater flooding. However, they have no statutory responsibilities in relation to water resources and their associated supply and distribution infrastructure. Borough public health directors are responsible for implementing Public Health England's national heatwave plan in order to manage population health and well-being;
- London Fire Brigade will respond to dangerous flooding, but have no statutory duty to do so;
- Tideway (Bazalgette Tunnel Limited) is the company financing, building, maintaining and operating the Thames Tideway Tunnel, in partnership with Thames Water and with approval from DEFRA and OfWat (see below).

The Mayor's Role

The Mayor has no direct regulatory role or legal powers in relation to water resources, or their associated supply and distribution infrastructure. However, the Mayor's policies and programmes provide opportunities to influence water supply and demand, for example through his Sustainable Drainage Action Plan which has supported water re-use projects. The Mayor, through his convening power, is well placed to offer a strategic view of water resource supply and demand to ensure a resilient and affordable supply for Londoners.

The Mayor has a legal duty to set out policies and proposals for adapting to and tackling climate change, of which flooding is one of the most significant risks. Although the Greater London Authority (GLA) is not a flood risk management authority, the Mayor produces a Regional Flood Risk Appraisal that sets out the flood risk across London and how it affects existing and proposed

developments. The Mayor has also included climate change adaptation policies in the new London Plan.

This dispersed accountability structure impedes coordination between water companies and other authorities. This becomes a particular issue during emergencies. Water transfers between companies can be vital to ensure resilience and for supplies to be delivered where they are most needed. In evidence to the House of Commons Environment, Food and Rural Affairs (EFRA) Committee, Rachel Fletcher, the CEO of Ofwat, agreed, stating that in emergencies, companies should be "co-operating and collaborating so that customers get the best possible service" rather than "thinking about this as a commercial transaction".[5]

However, for this coordination to be effective and consistent, it must be set up before the next crisis.

Image 2: Leonie Cooper AM visits Tideway construction site in Dormay Street in Putney.

Thames Tideway Tunnel

London's sewer system was, when built in the 1800s, one of the greatest engineering projects on the planet. Sir John Bazalgette, the sewers' pioneering designer, had the foresight to design sewers for a far higher population than London had at the time. However, since then, the population has grown far more than Bazalgette or anyone of his day could have predicted – to 8.8 million. This has put London's underground drainage system under unprecedented pressure, resulting in tens of millions of tonnes of sewage spilling out into the River Thames each year. The effect on the river's fish, birds and aquatic mammals is profound.

Tideway is a 25km tunnel under the River Thames, that, when completed in 2024, will drastically reduce pollution in the Thames. Tideway is upgrading London's sewer system to cope with its growing population. The tunnel will intercept, store and ultimately transfer sewage waste away from the River Thames, drastically reducing the amount of pollution entering the river.

Starting in Acton, west London, the tunnel will travel through the heart of London at depths of between 30 and 60 metres, using gravity to transfer waste eastwards and away from the city.

Why are London's water resources under pressure?

The causes of London's water strains are complex and interconnected. Ensuring London has enough clean water for drinking, cleaning, industrial cooling, flushing toilets and everything else that happens in a modern city, is becoming more and more difficult. A growing population has put additional pressure on the sewage system, resulting in pollution leaking into the river and burst pipes. Similarly, a loss of green space in London means that water that cannot get into the sewers also cannot escape into the ground, instead remaining on impermeable surfaces, contributing to floods.

Issues with London's water supply are exacerbated by climate change. London is facing more extreme weather than ever before, including both extreme cold and heat. Londoners will remember the floods across south London in early 2018, which occurred when extreme freeze-thaw weather burst old pipes and left many households without water supply for days.

At the other extreme, drought in the capital is becoming more likely. In July 2018, London was just two weeks away from another hosepipe ban due to a period of exceptionally dry and warm weather. We also saw a heatwave in February 2019 instead of the expected cold weather. Without action, climate change is only going to continue or get worse, which means London urgently needs sustainable water management systems.

Investment in water resources

In 2017/18, Thames Water made £34.6m pre-tax profit.[6] Additionally, the CEOs of the nine water companies took home an average of £1.2 million in 2017.[7] Meanwhile, in 2017/18, the average household water and sewerage bill in England and Wales was estimated at £395 – an increase of £6 (2%) compared with the previous year.[8] The National Audit Office in 2015 estimated that household water bills have risen by 40% above inflation since the industry was privatised in 1989.[9] Water companies argue that they need to turn a profit in order to invest in infrastructure improvements without increasing bills.[10] However, investment in water supply infrastructure was lower in 2018 than in 1990.[11] Furthermore, evidence shows that much of this work has instead been financed through taking on more debt instead of eating into profit margins. The year after Thames Water was taken over by a consortium of financial investors in 2006, the company made a profit and paid a dividend of £656.3m, but net debt increased by £2.3bn (98%) between 2006 to 2008.[12] When Affinity Water was bought by a group of financial investors in 2012, net debt rose by 61%.[13]

The fact that water companies take on debt to finance repairs while continuing to make profits shows that it would be viable for them to invest in more leak prevention and repair without having to increase customers' bills.

Recommendation: The Mayor should lobby water companies and OfWat to work effectively together to ensure a higher level of investment in water supply infrastructure, to enable water companies to meet leakage reduction targets while providing a good and affordable service.

London's Leaks

The quantity of water lost from leaky pipes in London is unacceptable and hugely wasteful. Every day in England, enough water to meet the needs of 20 million people is lost through leakage.[14] An astounding 25% of the water put into Thames Water's network is lost through leaks from pipes.[15] Although Thames Water have been undertaking a leakage reduction programme, in spring and summer of 2018 their leakage was almost 700 million litres a day,[16] the equivalent of sixteen Olympic swimming pools over and above its target.

The Environment Agency has previously warned that the amount of leakage has meant that water companies have been relying on abstraction, which is not a sustainable or environmentally friendly method of sourcing water.[17] In fact, the Environment Agency estimates that in 2017, abstraction from around 28% of underground sources and up to 18% of surface waters was at higher than sustainable levels, which is damaging for river wildlife and their habitats.[18] Unless the amount of water lost through leaks is drastically cut, water companies will add to the risk of exacerbating dry spells and drought in the capital.

What is abstraction?

Abstraction is simply the process of taking water from rivers or the ground for use by people. 'Over-abstraction' - taking water faster than it can be replaced - can risk not leaving enough water for wildlife. When there are water shortages, due to low rainfall or leaky pipes, water companies might increase abstraction to compensate.

In some cases, over-abstraction has actually led to some streams disappearing entirely for periods of time. Over-abstraction from the ground can lead to the water table falling as groundwater levels get lower, known as 'aquifer depletion'.

Image 3: Chalk streams, such as this one in Denham Country Park, just outside London, are particularly vulnerable to over-abstraction. Image source: wikimedia commons.

OfWat has set water companies a target of reducing water lost through leaks by 15% between 2020-2025. However, given that the National Infrastructure Commission has instead recommended that water companies should aim to cut leaks by 50% by 2050,[19] it is clear that OfWat's target does not go far enough in reducing water wastage.

What is especially notable is that the cross-party House of Commons Environment, Food and Rural Affairs Committee shares the conclusion that the 15% target may not be 'ambitious enough'.[20] In the case of Thames Water, for example, cutting their leaks by 15% by 2025 would save 105 million litres every day, cutting leakage by 50% by 2050 would save 350 million litres a day.

Recommendation: The Mayor should support the National Infrastructure Commission's call for water suppliers in London to cut leaks from their system by 50% by 2050, and lobby OfWat to set and monitor ambitious interim targets to ensure progress.

Burst water pipes

The most severe leaks in the water network, due to significant pipe bursting, can leave buildings without any water supply at all. Yet many customers report that the emergency response from water companies is inadequate and fails to match up to expectations.

For example, in 2018 large parts of Lea Bridge, in Hackney, were left completely submerged after a water main burst and was not repaired for days. Testimonials from affected residents, given in evidence to Hackney Council, describe chaotic scenes, with seemingly no coordinated emergency response, leaving residents in the dark about what was going on and when it would be fixed.[21] Residents were left without clean water in their homes for drinking, leaving them unable to wash or cook. This is clearly unacceptable.

The number of burst pipe incidents in London since 2015 is growing. Data obtained from Thames Water and Affinity Water show over 26,000 pipes burst in London between 2015 and the end of February 2019. Within two months of 2019, London has seen a fifth of the burst pipes it saw in 2018, and a quarter of those seen in 2015. While it is to be expected that more pipes would burst during the colder months, this is still a very concerning number.

Furthermore, the impact of the 'Beast from the East' is clear, as 2018 had nearly 1,500 more burst pipes than the next highest year.

The Mayor and GLA, via the London Resilience Forum (LRF), provide a mechanism for cooperation between 170 key stakeholders, including Government agencies and water companies.[22] The LRF draws up the London Risk Register and London Resilience Partnership Strategy, which in turn help direct the resilience work of statutory bodies such as the London Fire Brigade.

The LRF has agreed with its partners a number of Frameworks for responding to water-related emergencies, covering water supply disruption and drought response, as well as extreme weather.[23] However, the rankings for these emergencies might not fully represent the reality of Londoners' lives, in terms of likelihood of occurrence, and should be reassessed.

Londoners losing their water supply is unacceptable and a risk to their health. Water companies must provide greater clarity and communication during emergencies. It is in their interest as without this, Londoners' confidence in their water suppliers will be undermined.

Year	Number of burst pipes
2015	5,642
2016	5,098
2017	6,154
2018	7,623
2019 (up to end of February)	1,565
Total	26,082

Figure 2: Number of burst pipes in London since 2015. Source: Water companies

Natural drainage

Gardens in London are disappearing fast: London is losing gardens at the rate of an area two and a half times the size of Hyde Park every year.[24] Green space enables water to drain through permeable ground and helps prevent surface water flooding. When green space is replaced with concrete or other hard surfaces, excess surface water has nowhere to go and floods can occur.

Additionally, green spaces also help to mitigate the urban heat island effect and keep London cool, increasing the risk of heatwaves and drought. The urban heat island effect means that the centre of London can be up to 10°C warmer than surrounding countryside.[25] Green space in London must be protected, to reduce the risks of both flooding and excess heat.

Waterways provide sustainable drainage, but rely on being well maintained in order to function most effectively. Anecdotal evidence Assembly Members receive in areas affected by flooding indicate that this is not the case. Most waterway maintenance falls under the remit of the Environment Agency, but the GLA and local authorities can play a role in reducing flood risk from waterways, for example by funding improvements to the riverbank that allow water to drain away naturally if the river is at risk of overflowing.[26]

What is sustainable drainage?

Sustainable drainage is any feature that aids surface water runoff in a way that mimics the natural environment. This includes green space and waterways as well as building modifications, including rainwater capture for water in the home, such as for flushing the toilet. Maximising the amount of sustainable drainage will be essential for ensuring London is able to cope with extreme wet weather without widespread surface flooding.

In December 2016, the Mayor launched his Sustainable Drainage Action Plan, which aims for London to manage its rainwater more sustainably by 2040 to reduce flood risk and improve water quality and security.[27]

In addition, the Mayor's draft new London Plan contains a provision that developers should aim to have a high level of sustainable drainage in new developments. However Natural England, in their response to the Plan, argued that these policies may not be sufficient as there needs to be more cross-Borough collaboration on the installation and maintenance of sustainable drainage to ensure sufficient provision in the right locations.[28]
A working group with stakeholders will enable pan-London working.

Recommendation: The Mayor should support sustainable water management in London by convening a working group with key stakeholders to develop and implement joint action plans on leaks, sustainable drainage, and customer communication.

Image 3: Sustainable drainage at River Ravensbourne, Ladywell Fields

Case study: River Ravensbourne, Ladywell Fields, Lewisham

The River Ravensbourne runs through Ladywell Fields in Lewisham, south London. Previously, the river ran through a concrete channel which put it at risk of overflowing, as water was unable to drain away through the banks.

A river restoration project was undertaken, in partnership between the GLA, London Borough of Lewisham, European Union's LIFE Environment fund and Environment Agency, to improve its environmental and social benefits.

This meant giving it more room to safely store flood water during rainy spells and creating more habitats for wildlife, including kingfishers and herons.

Not only has this project reduced flood risk, it has enhanced habitats, resulting in a near 100% increase in the number of species; particularly fishing birds, and made the park a more pleasant place to spend time, resulting in doubled usage by local people.

Are we using too much water?

Water companies have a huge responsibility for ensuring the resilience of our water system, but there are steps that we all can take to reduce our water usage.

Average water consumption in London is 149 litres per person per day, over 5% higher than the national average of 141 litres per person per day.[29] Reducing water consumption is beneficial for the resilience of the water system and can help people to reduce their energy bills. According to the Energy Saving Trust, about 15% of a typical gas heated household's heating bill is from heating the water for showers, baths and hot water from the tap.[30] This is on average about £80 a year.

Water meters, by helping customers to track how much water they are using, help to reduce demand for water and the strain on the whole system. If all households had a water meter, this could save significant amounts of water by changing some simple behaviours. Almost half of households with a garden and a water meter used a water butt, compared to 37% of households without a meter.[31] Furthermore, 80% of people in metered households turn off the tap while brushing their teeth, compared to 70% without a water meter.

On average, families reduce their water usage by 10% to 15% after a water meter is installed.[32] This translates to 30-40 litres saved per family per day. As a rule of thumb, MoneySavingExpert states that if there are more or the same number of bedrooms in your house as people, a water meter could save you money.[33] Water providers are rolling out water meters across London, but this rollout should be accelerated, in conjunction with an awareness raising programme so Londoners understand how their household might benefit.

Meters also help to identify leaks between the main pipes and customers' homes, by revealing discrepancies between the amount of water leaving the mains and the amount used in a building. By more effectively identifying leaks, installing water meters across London will enable water suppliers to accelerate their leakage reduction programme, as well as saving Londoners more money on their bills.

Some water companies already provide water-saving features, such as efficient showerheads to their customers, which aids in reducing the costs of bills. Water efficiency retrofitting, such as rainwater capture for irrigation or greywater (any household wastewater except from the toilet), can also act as sustainable drainage, reducing pressure on the sewerage system.

It is important that campaigns to reduce water consumption take account of all causes of excessive water consumption. Specifically greater awareness of the amount of water required to produce everyday goods such as our clothing and food – called the 'water footprint' of what we consume.

Taking into account the water footprint of consumption, the most recent available data reveals that, on average, people in the UK consume a staggering 3,400 litres per person per day, equivalent to each person taking over 20 baths every day.[34] For example, one kilogram of cotton - equivalent to the weight of a shirt and pair of jeans - can take up to 20,000 litres of water to produce.[35] Londoners should be supported to make more sustainable purchases, enabling old goods to be reused and recycled, and pressuring manufacturers to reduce the amount of water used in the production process.

Recommendation: The Mayor should collaborate with water companies in London to conduct an awareness raising campaign to help Londoners save water. To do this, the Mayor should:
- partner with the 'Water Label' to promote the scheme to Londoners,
- lobby producers to sign up to the scheme and link with built environment, procurement and water efficiency initiatives,
- include 'water footprints' in his awareness raising campaign, to help raise awareness and reduce water consumption.

Buildings should be designed with water-saving devices and have capture and reuse in mind from the outset. Appliances such as dishwashers and washing machines are available in varying levels of water efficiency, and purchasers should be encouraged to choose the most sustainable options.

The 'Water Label' scheme identifies and promotes water efficient products, allowing purchasers to make an informed choice when shopping for goods.[36] However, as these products are often more expensive than the market average, increasing the number of suppliers involved in the programme could bring down the overall costs of water efficient appliances for Londoners.

Recommendation: The Mayor should work with water companies to roll out a water efficiency retrofitting pilot and water meter installation programme across London.

The Mayor's draft new London Plan states that new developments should achieve mains water consumption of 105 litres or less per head per day. The Environment Agency said in March that we should actually be aiming for around 100 litres consumption a day by 2050.[37] Building regulations in England also specify a minimum standard of water efficiency for new buildings. For example, the regulations require that showers have flow rates of ten litres per minute or less.[38]

However, other organisations, such as the Energy Saving Trust, recommend that developers and purchasers actually look for goods that are more efficient than required by regulations. They recommend, for instance, that showers should have a maximum flow of eight litres per minute.[39]

Developers and purchasers should be encouraged to select products with the maximum level of efficiency, going above and beyond building regulation requirements, to meet the Mayor's 105 litres per day target. Developers should also install recycling for greywater. Moreover, as many water efficient features can be retrofitted into existing buildings, the Mayor should introduce a programme to support this across London, beginning with buildings owned by the GLA Group, including TfL.

Recommendation: The Mayor should require developers to select the most water efficient appliances for inclusion in new developments and install greywater recycling.

City Hall efficiency

The GLA was designed to be as environmentally friendly as possible. This includes extracting ground water from bore holes beneath the building, which is circulated around to keep the building cool. This water is then reused for flushing toilets. City Hall is an exemplar for environmentally friendly design, and the Mayor could examine how other GLA Group buildings could follow suit.

Recommendation: TfL and other GLA bodies should conduct an assessment of the water efficiency of their buildings and retrofit water-saving devices and greywater recycling, where not already installed.

The future of London's water crisis

Flooding

The climate crisis means that London will need further mitigation against both serious flooding and serious drought. The recommendations in the previous sections will support resilience, but we can't rely on these policy changes in the long run. Evidence from the Intergovernmental Panel on Climate Change shows that the planet is fast approaching a 'tipping point' in terms of climate breakdown, meaning that climate change will happen much more quickly and be more extreme than expected. To ensure London has a resilient and safe water system, we need significant mitigation measures.

The Thames Barrier is London's most famous tidal flood defence system. It is the second largest flood defence barrier in the world, after the Oosterscheldekering Barrier in the Netherlands. The Barrier was constructed in 1982, and it is estimated that, without the Thames Barrier, as many as 1.25 million Londoners, across half a million homes, would be at risk.[40]

Operated and maintained by the Environment Agency, the Thames Barrier is coming under increasing strain due to climate change. As sea levels have risen and extreme weather events become more common, the Barrier has been closed 64 times since 2010, compared to just 33 times in its first 17 years of operation.[41] The estimated date that the Barrier will need to be replaced is 2070 based on the estimate of up to 90cm sea level rise.[42]

However, there is increasing evidence that sea levels are rising more quickly than expected, due to extremely worrying melting of ice at the Poles. More extreme and unpredictable rainfall will increase pressure on river banks and increase the chance that they will burst. It is imperative that this ongoing and changing threat is monitored to ensure the Barrier remains fit for purpose.

Recommendation: The Mayor should lobby the Government to conduct an assessment of the costs and benefits of bringing forward the construction of a new Thames Barrier to protect Londoners against faster than anticipated sea level rises.

Figure 3: In December 2013, following the biggest North Sea storm surge for 60 years, the Environment Agency published this map showing the probable effect on central London if no barrier had been in place.

Drought

London's drought resilience will also need strengthening in the coming years to adapt to the climate crisis. The Environment Agency recently warned that within just 25 years, the South East of England could run out of water.[43]

To provide extra resilience for water supplies, Thames Water and Affinity water have proposed constructing a reservoir in Abingdon in Oxfordshire, which would create extra storage for millions of litres of water for London. Thames Water and Affinity Water must accelerate construction to 2035, two years sooner than proposed.

Severe supply shortages to London would have severe economic, social and environmental consequences.

Furthermore, the reservoir could provide important flood mitigation by providing extra water storage capacity. Londoners need robust mitigation against extreme weather and the Abingdon reservoir is the best solution to ensure supply, along with effective demand management methods such as leak prevention and repair.

Thames Water are currently going through a process to get approval to construct the reservoir.

The alternatives to the Abingdon reservoir rely far too heavily on unsustainable and impractical river abstraction. River abstraction should be a last resort in times of extreme water stress, not a long-term solution (see page 8).

Abstracting from the bottom of a river to the top of the Thames would result in contamination by suspended silt into an otherwise clean section of the Thames. Directing water from another river into a reservoir, only when the reservoir was at low levels, would allow the silt time to settle before clean water could be transferred into the Thames. It also provides valuable storage to ensure rain is put to good use in the water system.

Thames Water and Affinity must ensure that when they construct the reservoir they put biodiversity and access for people towards the top of the priority list.

Recommendation: The Mayor should call upon OfWat and the Environment Agency to grant permission at an early stage for the Abingdon Reservoir construction, and Thames and Affinity Water to construct the Abingdon Reservoir as soon as is practicable, with completion no later than 2037.

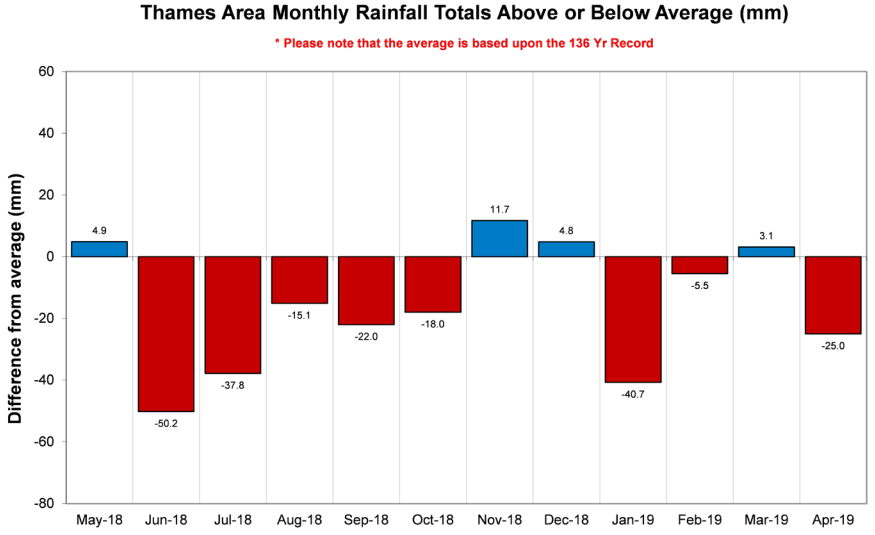

Figure 4: Thames area monthly rainfall totals above or below average. Source: Thames Water

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Front cover image: " Water main burst in Herne Hill causing widespread damage" by Andy Thornley, Flikr (https://www.flickr.com/photos/62954923@N03/15004034324)

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