
OUR DRAFT DROUGHT PLAN 2022 SUMMARY

**NORTHUMBRIAN
WATER** *living water*

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Welcome

We supply water to approximately 2.6 million customers in our supply area which extends from the Scottish border in the north to the Yorkshire border in the south and as far west as the Cumbrian Border. When our customers turn on their tap, they expect clean, clear and great tasting water to flow. It is our job to make sure this happens and that there is enough water for every one of our customers – now and in the future.

This relies on some careful planning in our Water Resource Management Plan (WRMP) which forecasts the demand for water in the future and considers this against the water that will be available. Decisions are then made to address any areas where there are shortfalls in supply. The water resources planning in our WRMP is also supported by our Drought Plan.

Over the following pages you will find a summary of our draft Drought Plan 2022.

Our Drought Plan details how we will ensure that we can always provide sufficient water for our customer's basic needs, however bad a drought becomes. It confirms how we will manage a future drought, what trigger levels can be used to identify when action is required, and what those actions are to ensure we maintain resilient supplies, even during the most severe of droughts. It also outlines how the effects of a drought and drought actions will be communicated to our customers and takes account of the need to undertake environmental monitoring at those sites potentially affected by the implementation of drought actions. Drought Plans are submitted by all English and Welsh water companies every five years.

More in-depth information can be found on our website www.nwl.co.uk/droughtplan.



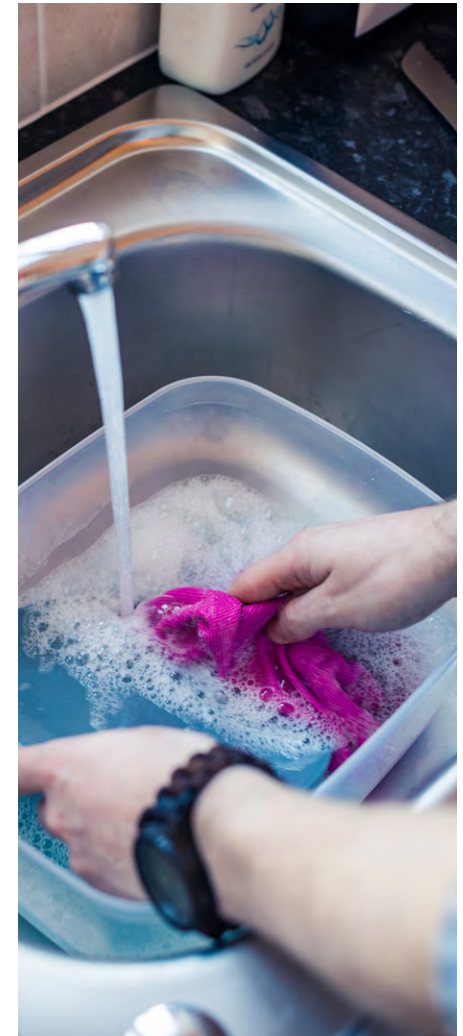
It is our job to make sure this happens and that there is enough water for every one of our customers - now and in the future.

WE ASKED FOR YOUR VIEWS ON OUR DROUGHT PLAN

In June 2021 we carried out a six week consultation on our draft Drought Plan, asking customers, regulators and stakeholders for comments.

We will publish on our website a Statement of Consultation in response to the points raised.

More information can also be found on GOV.UK: **[“Drought: how water companies plan for dry weather and drought”](#)**.



What is a drought?

There are many definitions of drought.

The Environment Agency (2008), defines drought as “...a **period of low rainfall which creates a shortage of water for people, the environment, agriculture, or industry**”.

Beran (1985) defines drought as, “**A decrease of water availability in a particular period and over a particular area**”.

This definition reflects the very unique nature of every drought in terms of its intensity (i.e. the size of the rainfall deficit), seasonality (i.e. when it occurs), duration and the regions it may affect.

Our supply area is located within one of the wettest parts of the UK. In an average year, we typically receive 1100mm of rainfall.

Recognising this, the Environment Agency, our environmental regulator, has determined that our supply area is in the medium water stress category and not the serious category which would have required us to consider compulsory metering.

Given we operate in a wet region, below average rainfall is seldom a problem due to the way we operate our water resources system. For example, during a dry summer, we draw on water stored in our reservoirs and in underground aquifers, both of which will have been filled during the winter months. However, a dry summer followed by a dry winter and then another dry summer could be of more concern. So, the type of drought will determine whether we need to adopt drought actions which might include putting in place actions to reduce our customers' water demand and sometimes actions to increase available water supplies. These actions are tied into the Level of Service we provide.



In an average year, we typically receive 1100mm of rainfall.

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This is underground water bearing rock. For example, we abstract groundwater from the Chalk aquifer by drilling a borehole down into the Chalk rock.

RAINFALL DEFICIT

Typically, 1100mm of rain falls on our region each year. However, in a drought year, we may only measure 800mm per year. Therefore, the rainfall deficit in that year would be 300mm.



Where our water comes from

We manage water supply and demand in areas known as Water Resources Zones (WRZ). We have two of these in our area. The Kielder WRZ accounts for 99% of demand and the Berwick and Fowberry WRZ for 1%.

Kielder WRZ is predominantly fed by a large number of impounding reservoirs which supply Water Treatment Works (WTW) directly or feed into rivers which then supply the WTW. There are also a number of groundwater sources including the boreholes around the Sunderland area and a small number of isolated springs that supply small communities in rural West Northumberland.

Berwick and Fowberry WRZ is fed by boreholes with sufficient excess licensed capacity to satisfy any drought year demand for water.

FIGURE 1:
Northumbrian Water Supply Areas



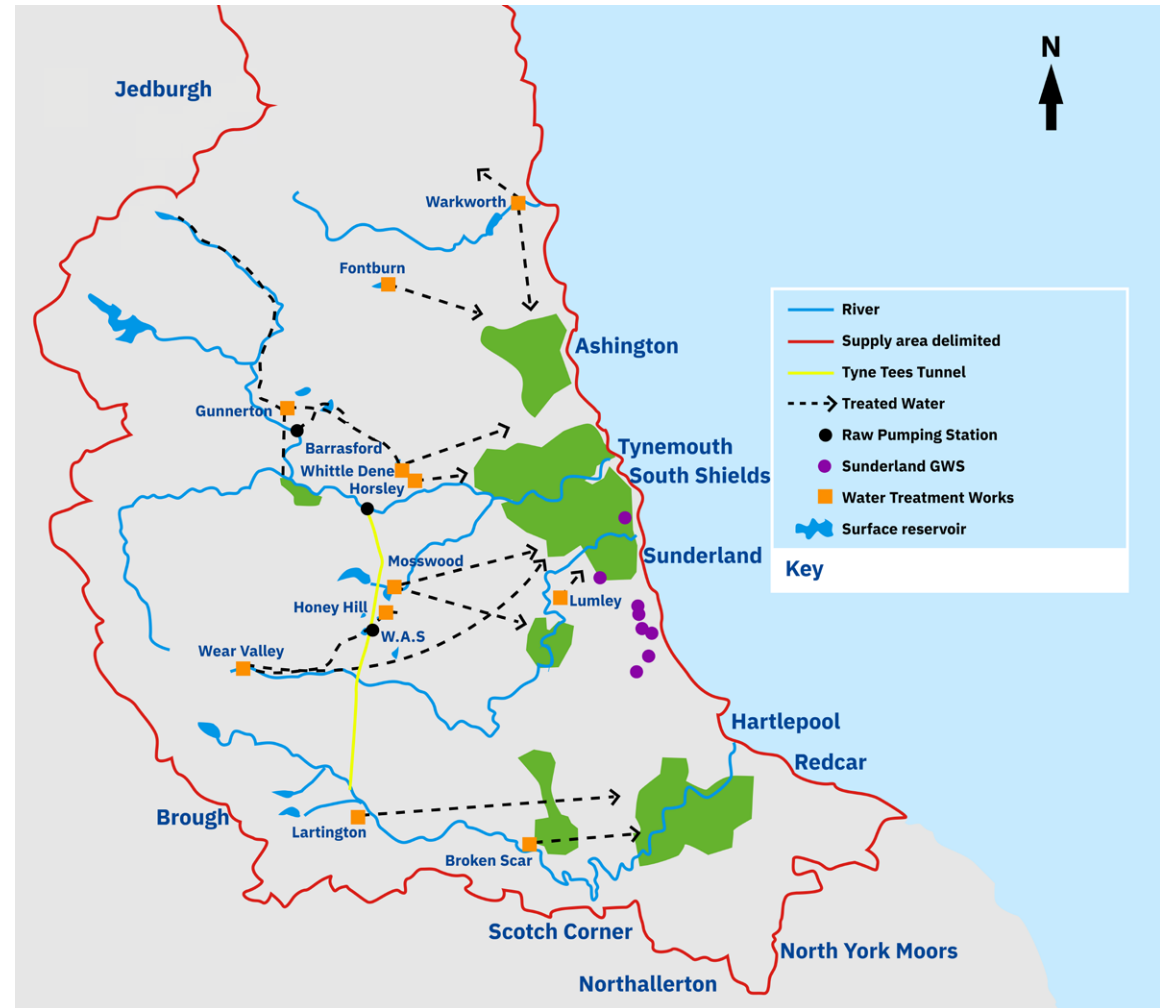
Water supply in Kielder WRZ

Kielder reservoir, when full and with no new water entering it, holds sufficient water to supply all of our customer demand for around a year. This is clearly a hypothetical situation as there will be natural inflows of water into the reservoir from the upstream catchment. However, it illustrates the colossal volume of water held in Kielder reservoir.

In the Kielder Water Resource Zone, the vast majority of supply to WTW's comes from impounding reservoirs and we abstract water locally from the rivers Coquet, Tyne, Wear and Tees. Supporting all of these abstractions is the Kielder Transfer Scheme (see Figure 2).

The scheme allows water to be released from Kielder Reservoir into the river North Tyne and it can be abstracted at various point to support our infrastructure. The main abstraction is on the Tyne at Riding Mill where water is pumped into a tunnel which runs approximately 40 km to the river Tees (known as the Tyne-Tees Transfer or TTT). Along that route water can be released to support abstractions from various reservoirs and also released into the river Wear to maintain supply to Lumley WTW. We utilise elements of the Kielder Transfer Scheme most years and clearly its use will be increased in the event of a drought.

FIGURE 2:
Kielder Transfer Scheme



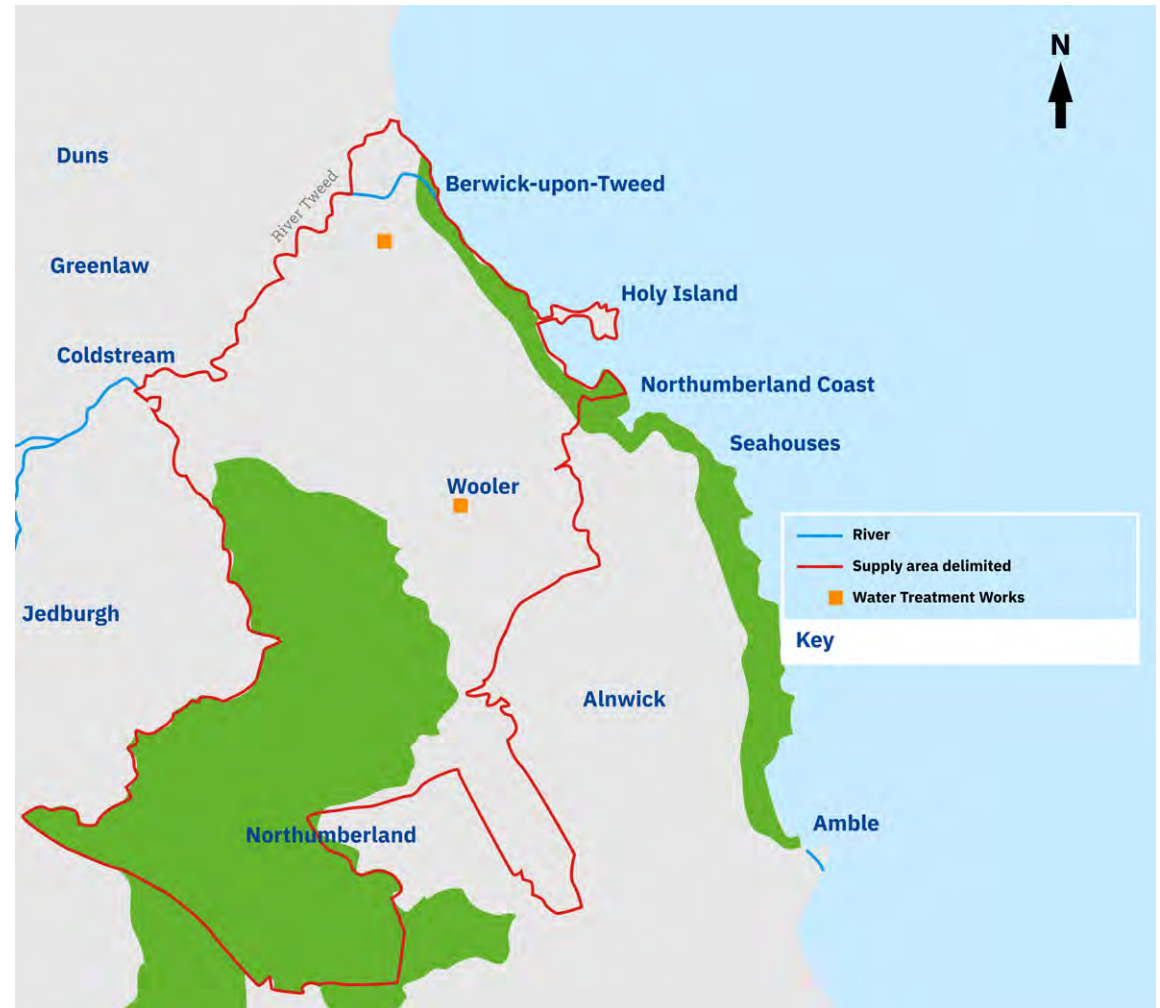
Water supply in Berwick and Fowberry WRZ

The most northerly area of our supply area is supplied by a number of boreholes which abstract water from an underground aquifer in the Fell Sandstone and supply two WTW's.

In the Berwick and Fowberry WRZ all the water supplied is abstracted from the Fell Sandstone aquifer and there are groups of boreholes which supply two WTW's. To the west and southwest of Berwick five borehole sites supply water to Murton WTW which then provides water for Berwick and the surrounding area.

To the east of Wooler there are two borehole sites which provide water to Fowberry WTW which then supplies Wooler and the surrounding area with the treated water network stretching to Cornhill. The two WTW's areas are linked within the treated water distribution system.

FIGURE 3:
Berwick Water Resource Zone





Our levels of service during drought

During long or very intense droughts, we may need to place some restrictions on customer water use to ensure we are always able to maintain reliable supplies should the dry weather turn into an extreme drought.

Without these levels of service, we would need to develop new water supply schemes such as new winter storage reservoirs. However, this would result in water becoming significantly more expensive.

We have agreed with our customers the following level of service for four level of restrictions on water use during drought.

DROUGHT ACTION	FREQUENCY
Level 1: Appeal for restraint	1 in 20 years on average
Level 2: Phase 1 Temporary Use Ban	1 in 150 years on average
Level 3: Phase 2 Drought Order Ban	1 in 200 years on average
Level 4: Standpipes and rotacuts	1 in 250 years on average

Some droughts, typically those of short duration, do not require us to place restrictions on the use of water. However, we would always ask our customers to use water wisely.



It is worth knowing that we are meeting all of our levels of service and in fact, have never needed to introduce Level 2, 3 or 4 restrictions.

An **Appeal for Restraint** might be made during the early stages of a drought. We would use all our communication channels (e.g. social media and press releases) to ask our customers to Use Water Wisely.

As a drought develops, a **Temporary Use Ban (TUB)** might be required. For example, this would allow us to restrict the use of hosepipes for garden watering. They will still be rare and will only be implemented when there is a real need.

During severe droughts, we may need to implement a **Phase 2 Drought Order Ban**. This would allow us to place wider restrictions on the use of water.

During an unprecedented drought, we might need to reduce the water pressure in our network (known as **Pressure Reduction**).

It is worth knowing that in NWL we have only very seldom made an Appeal for Restraint and have never needed to introduce Level 2, 3 or 4 restrictions.

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We state our **Level of Service** for an Appeal for Restraint as 1 in 20 years. However, this does not mean that an Appeal for Restraint will be made with such regularity.

A 1 in 20 year event may for example occur 3 times in 20 years and then not again for another 50 years.

How we manage droughts

Figure 4 illustrates the supply and demand management process which we follow during a drought.

Stage 1: During this stage, we undertake our business as usual water resource monitoring (e.g. rainfall, reservoir levels and groundwater levels) as well as water supply and customer demand forecasting. This can include starting to use the Kielder Transfer Scheme which we do utilise in most years and is normal practice.

Stage 2: The monitoring of data from stage 1 will tell us when the trigger level has been reached for implementing a drought action. The very first trigger is the formation of our internal drought Executive Leadership Team which is chaired by our Water Director. The final decision for selecting and implementing a drought action lies with the Executive Leadership Team and Board.

As a drought intensifies, the Drought Management Group will brief the Management Team and Board with increased frequency.

Stage 3: This is when we will review the drought measures in our Drought Plan and decide which is the most appropriate to implement.

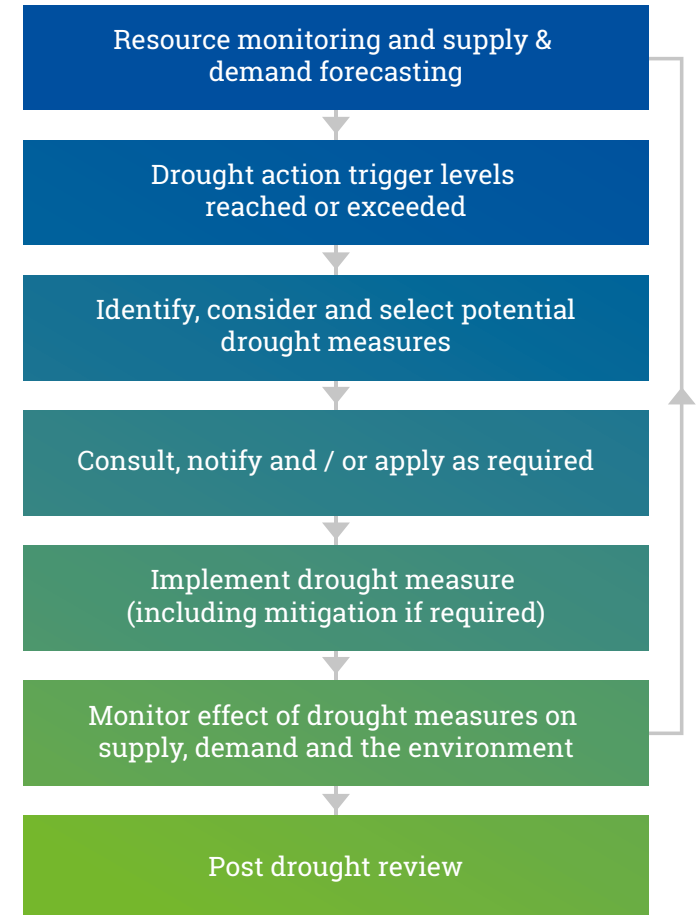
Stage 4: If we needed to implement some drought actions, we would be required to consult with our customers and regulators. Some water companies will need to make an application for a drought permit or Drought Order. We have no requirement to do so as increased operation of the Kielder Transfer Scheme is already covered in existing agreements.

Stage 5: We will then implement the drought action, which in our area will consist of an Appeal for Restraint.

Stage 6: Once a drought action has been implemented, we will monitor the effect it has on customer demand, and water supply.

Stage 7: Once our monitoring data has confirmed a drought is over and drought actions have been withdrawn, we will then undertake a post drought review, to identify lessons learnt and to review and improve our drought plan process.

FIGURE 4:
Drought Management Process



Restrictions on water use

It is highly unlikely that we will ever have to introduce any drought actions other than a Level 1 action however for completeness here we describe the other actions which would be available.

DROUGHT ACTION	FREQUENCY
<p>Level 1: Appeal for restraint</p>	<p>Appeals for restraint are the most frequently introduced drought action but also the least restrictive, relying on the goodwill of our customers. An appeal for restraint is when we provide our customers with clear information about how the dry weather is affecting our water resources and where we ask them to use water much more carefully than normal. This is achieved by using various forms of media including social media, radio and press. In addition to explaining the importance of using water more carefully, we also try to show how this can be achieved. Our website (www.nwl.co.uk) provides water efficiency tips and details of how to request free water saving products. Appealing to our customers' to save water is actually where the biggest savings in water comes from in a drought. Experience shows us that a demand reduction of 7% can be achieved by informing our customers of the need to save water. This is a significant reduction which could remove the need for further restrictions having to be imposed.</p>
<p>Level 2: Phase 1 Temporary Use Ban</p>	<p>A Phase 1 Temporary Use Ban (TUB) allows us to place restrictions mainly on the domestic use of water including the use of sprinklers and hosepipes for watering gardens and plants and washing cars and windows. It does not stop plants being watered with a watering can or cars or windows being washed with a bucket and sponge.</p> <p>The legal definition of a garden under these powers includes domestic gardens, parks, public gardens, allotments and sports fields, including golf courses, cricket fields and racetracks. Cleaning covers domestic cars, boats, windows, patios and buildings.</p> <p>Some commercial groups could be affected by a TUB. For example, nursery and garden service trade could be affected as customers might be less willing to buy plants or lay a lawn. To minimise the effect on trade, we would emphasise that watering of plants is not banned, only watering using a hosepipe.</p> <p>We will try to minimise any economic consequences for commerce from a TUB by exempting a number of activities and groups. This would be dependent on the severity of the drought and may change as a drought progresses. Our banning and exempting of commercial water uses will be proportionate to the prevailing situation and the water consumption of the activity.</p>

Restrictions on water use

(continued)

During more severe droughts, we may need to introduce further restrictions on water use.

DROUGHT ACTION FREQUENCY

Level 3:
Phase 2 Drought Order Ban

Our levels of service for a Drought Order Ban (1 in 200 years on average) means that they are very rare. In fact, we have never needed to introduce a Drought Order Ban. A Drought Order Ban bans what has been applicable to the domestic customer under the Temporary Use Ban, to non-domestic or commercial customers. These bans have economic consequences for businesses and have to be used as sparingly as possible. Our intention would be to apply for powers to ban all of the activities open to us, but only apply each restriction when necessary and when beneficial in terms of water savings in proportion to economic impact. If ever needed, a Drought Order Ban will only be introduced once a Temporary Use Ban has already been implemented.

Level 4:
Standpipes and Rotacuts

Level 4 restrictions fall outside of our Drought Plan and instead fall under our Emergency Plan. Restrictions include rota cuts (i.e. water supplies are turned off for several hours per day) and in-pavement standpipes for filling water containers.

DID YOU KNOW...?

Using a watering can keeps your plants alive but uses a fraction of the water a hosepipe would as water is directed more accurately to where it is needed. Lawns do not need to be watered. They may turn brown during hot dry periods but they always recover when it eventually does rain.

Hosepipes are covered by a Phase 1 TUB because they can use over 500 litres of water in 1 hour.

This volume of water is greater than the total daily consumption of water for the average household.





How we will implement our drought actions

Our Drought Plan contains a number of measures to reduce water use during a drought in order to conserve water supplies.

We will implement Level 1 drought actions first, followed by Level 2 actions, Level 3 actions and then finally, in unprecedented times and in an emergency, Level 4 actions.

We do not have any formal Level 3 drought permit drought actions to increase water supplies. This is because experience of previous drought and more recent hydrological modelling has shown that we only ever need to implement a Level 1 Appeal for Restraint. If needed, we could implement a Level 2 Temporary Use Ban. However, we do not believe that any Level 3 Drought Permit actions are required.



Extreme drought measures

Our Drought Plan identifies the triggers that we will use to determine when a drought action should be implemented.

In the Kielder WRZ, our drought action triggers are agreed water levels in our reservoirs known as control curves. Crossing these curves mean that we will take actions to limit abstraction from the reservoirs and increase the use of the Kielder Transfer Scheme and TTT. Enhanced utilisation of the system is designed to avoid levels dropping to such an extent that actions beyond Level 1 are necessary.

In the Berwick and Fowberry WRZ our drought action triggers are groundwater levels on the Fell Sandstone aquifer.



Our drought action triggers are agreed water levels in our reservoirs known as control curves.



Extreme drought measures

(continued)

The table below summarises the actions we have identified that we think could be implemented in an extreme drought (after level 3 restrictions such as non-essential use bans) to delay the need for level 4 severe drought restrictions such as emergency drought orders that authorise the use of standpipes or water tanks.

ACTION	WRZ	SUMMARY OF ACTION	TRIGGER FOR ACTION	LIKELY SAVING BENEFIT	BARRIERS	ENVIRONMENTAL IMPACTS	TIMESCALES	PRIORITY ORDER
Demand	All	Media & Communications: National campaigns, excessive water use seen as socially unacceptable, Day Zero language, guides for customers to show how to restrict water use to 50 litres/ person/day.		Logically, these actions will result in a reduction in demand. However, we do not believe it is possible to quantify the saving.	Hygiene - Covid.	No significant adverse environmental effects as the measure is to reduce demand and therefore abstraction.	2 weeks	1
Demand	All	Supply pipe repairs: Free and fast supply pipe repairs for customers.		0.18ML/d	Need customer's permission which is not guaranteed (impacts on driveways); Availability of NW resource (inhouse or contractors).		3 weeks	2
Supply	All (where opps. exist)	Trades/transfers: Short term trades between companies/sectors.	Extreme measures would be implemented after all Level 3 actions have been implemented and then based on priority order in this table.	Would be determined on a case by case basis taking account current resource position and water availability.	Donor permission; EA Trading Policy	This option might require abstraction above recent actual levels. The action would not be pursued if it required abstraction above their own licensed quantities.	6 weeks	3
Demand	All	Consideration of removal of some exceptions under TUBs and NEUBs.		Small reduction in demand. Unquantified	May need emergency powers; could impact on businesses; could be perceived as being discriminatory	No significant adverse environmental effects as the measure is to reduce demand and therefore abstraction.	Within 28 calendar days	4
Supply	All	Full range of powers available with drought orders: <ul style="list-style-type: none"> • Temporary increases to licences that have been reduced or revoked • Compensation flow reductions • Abstraction from alternative sources. 		Would be determined on a case by case basis taking account current resource position and water availability.	Need for emergency drought order. Environmental impacts, WFD objectives.	Potential for long term / permanent impacts on ecology and WFD status. See section below on Overriding Public Interest	Within 28 calendar days	5
Reduced mains pressure	All	Pressure management: Further reduce pressure while still maintaining essential services, night time reductions and protecting vulnerable customers		Unknown	Customer support; regulatory approval.	No significant adverse environmental effects as the measure is to reduce demand and therefore abstraction.	6 weeks	6

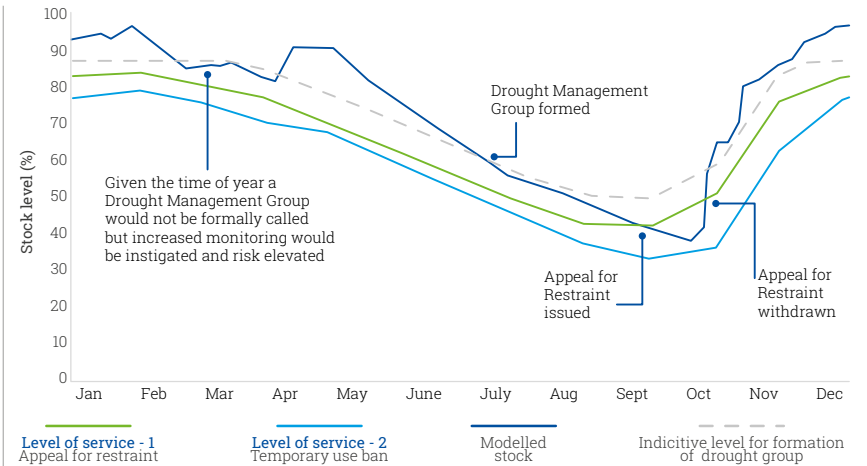
Testing our drought plan

Based on recent resource modelling undertaken, we know that our Kielder and Berwick and Fowberry WRZs are resilient to droughts that occur once every 200 years on average. During these droughts, we only needed to implement Level 1 (Appeal for restraint).

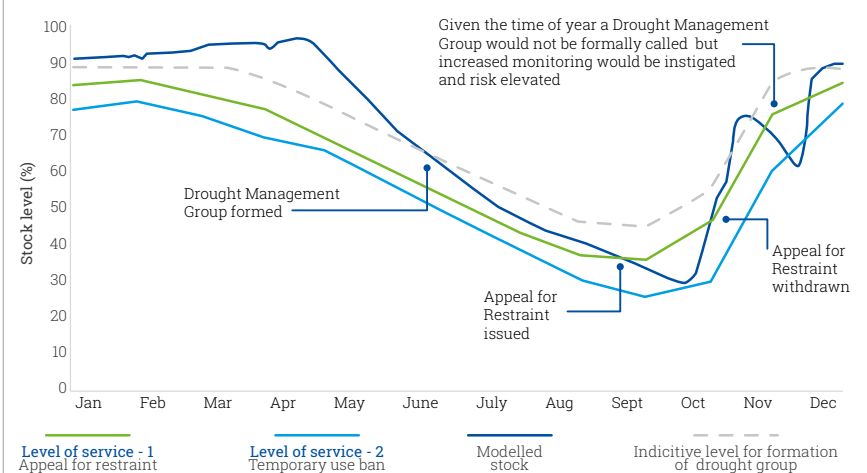
We did not need to implement Level 2 (Temporary Use Ban) drought actions, Level 3 (Non-essential use bans) or emergency Level 4 (Rotacuts and standpipes) drought actions.

The graphs to the right show the triggers for drought actions (Level 1) in two drought years. Drought actions would be implemented (following agreement by our Drought Management Group and in consultation with our regulators)

Drought Scenario Design Drought Year - 1959



Drought Scenario Design Drought Year - 1989



How we will communicate during a drought

Our Drought Plan sets out how we'll communicate in a clear and timely way with our customers, partners and other interested groups during a drought.

Water is a precious resource and therefore we talk to our customers all year round about how they can use water wisely.

Customers are becoming increasingly aware of their impact on the environment and truly understand that every drop counts.

We have a fantastic history of customer engagement campaigns targeting communities using our engagement vehicle Flo in our operating areas via Every Drop Counts and Whole Town Approach. As a result, we have a legacy of encouraging water saving and educating customers about the environment and we've made significant investments in our network to reduce leaks and bursts.

We have prepared a communications plan that sets out how we would work with our customers, stakeholders, retailers, non-household customers and other interested groups.

The communication plan sets out how we would increase awareness of water levels and the impact on supply, what we as a company are doing and what customers can do to help. The plan includes direct communication with customers and stakeholders alongside other communications methods such as social media and the use of local media outlets including radio. The key messages would include information on the current situation and promotion of water efficiency advice.



Water is a precious resource and we talk to our customers all year round about how they can use water wisely.

Where appropriate, we will agree joint regional communications with our neighbouring water companies including Yorkshire Water, United Utilities and Hartlepool Water. We will consider early and proactive communications with our customers to help inform and mitigate the impacts of prolonged dry weather and drought on the environment and / or other water users.



How our drought actions could affect the environment

Our policy is that we will utilise the Kielder Transfer Scheme to avoid the need to go beyond a Level 1 Drought Action (Appeal for Restraint).

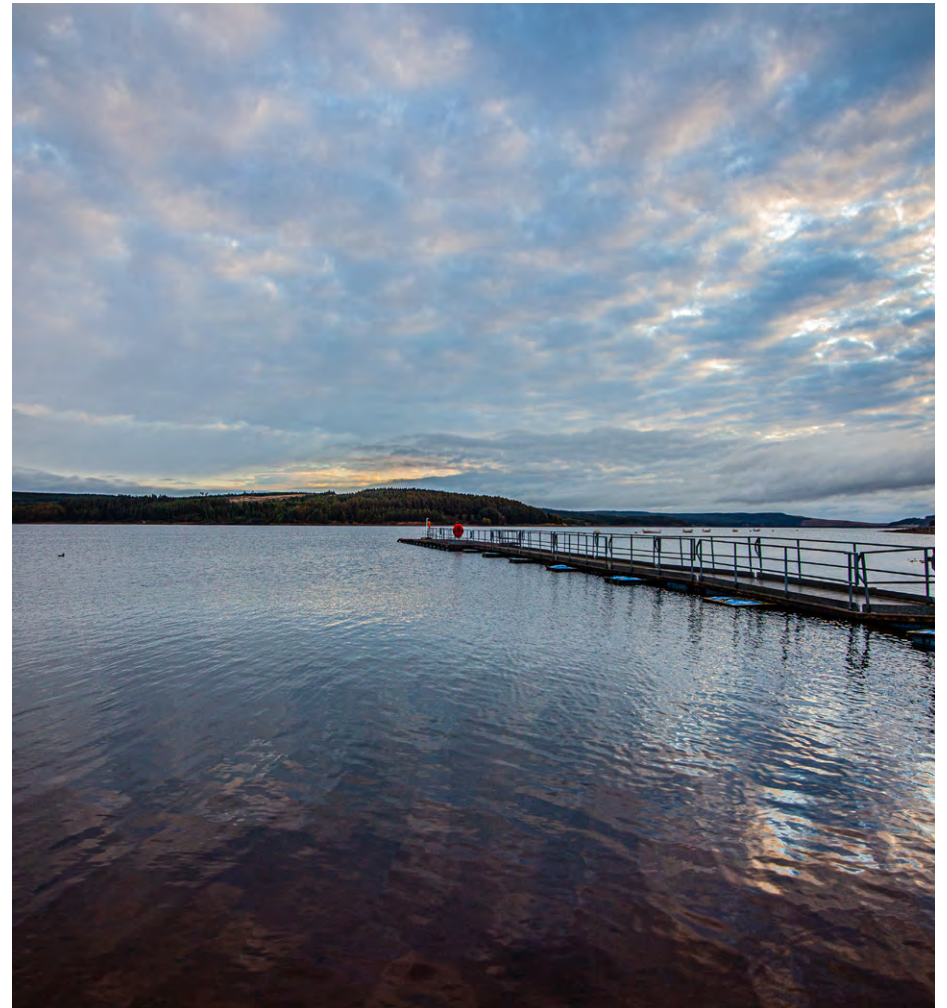
The use of Kielder reservoir and the Tyne Tees Transfer enables us to maintain sufficient flows in the three main rivers from which we abstract (Tyne, Wear and Tees) whilst ensuring we protect the environment and that we can continue to supply our Water Treatment Works with sufficient water to meet customer demand. Similarly, we can replace water taken from our impounding reservoirs with water from Kielder reservoir which maintains levels in those reservoirs. Both these operations ensure that there is minimal environmental impact as a result of our drought actions.

In our Drought Plan, we set out how we will monitor environmental indicators as a drought progresses. These include reservoir levels, river levels, rainfall and groundwater levels. These indicators trigger actions which in the main consists of enhanced use of the Kielder Transfer Scheme.

The overall aim of the scheme is to enhance the area's natural beauty and conserve flora, fauna geological and physiographical features of special interest with special consideration given to safeguarding and enhancing fisheries.



In our Drought Plan, we set out how we will monitor, assess and mitigate the effects of a supply side drought action on the environment.



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WATER *living water*

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