

draft Drought Plan 2027  
**Appendix 7:**  
**Extreme Actions**

May 2026

## Appendix 7 - Extreme Actions

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# 1. Introduction

Our Drought Plan provides a framework for drought management, it is based on previous experience in our region, as well as modelled scenarios not previously experienced, to ensure we are resilient to the effects of a 1 in 200-year drought as well as working towards system resilience to a 1 in 500-year drought. This part of the Drought Plan refers to the extreme actions that could be implemented at Level 3b. If the situation continues to deteriorate through Level 3b then we will refer to our Emergency Drought Plan which covers Level 4 ([Figure 1.1](#)).

Figure 1.1 How our different Plans work together to support drought management

Drought levels	WRMP	Drought Plan		Emergency Drought Plan	
BAU	Includes demand and supply drought actions but not extreme actions				
Level 1		Action preparation	Action implementation		
Level 2					
Level 3a					
Level 3b			Action preparation		
Level 4				Action implementation	

Our extreme actions have been updated taking into account information gathered since Drought Plan 2022. We have generated a suite of possible extreme demand- and supply-side actions that could be implemented during a Level 3b scenario. Extreme actions are to be used as “more before 4” measures which means that they will be applied to try and mitigate the need for Level 4 actions such as rota cuts.

## 2. Extreme Action Identification and Assessment

Actions identified have been assessed as being realistic and technically feasible, and as part of the assessment we have used the four key criteria provided in the Environment Agency's Drought Plan guidelines:

- include triggers with realistic lead-in times
- be practical to implement
- be likely to be temporary
- generally not result in permanent increases to Deployable Output (DO) i.e. usually distinct from a WRMP option

Using the previously identified extreme actions as a starting point a set of meetings were held with subject matter experts from each business unit to review the previous actions, provide further detail in relation to each action, explore potential new actions, and where possible note examples of projects or schemes that could be implemented in a Level 3b scenario.

We have also been active participants in meetings held with neighbouring water companies including Cambridge Water, Affinity Water and Essex and Suffolk Water as well as companies in the south-east through WRSE. The meetings and workshops allowed the companies to work together to share best practice, align on actions and discuss mutual support where appropriate. However, it was noted that mutual support may be limited during a severe drought event as a number of or potentially all water companies will likely be affected by the drought. Water companies will continue to meet during the lifetime of the Plan to explore potential further collaborations and innovations.

Individual actions that sit within each action type are currently being explored, one specific example of one of the action types listed in the tables below is as follows:

- **Utilising other significant water bodies** - we are exploring the use of quarries, disused gravel pits and Internal Drainage Boards that are close to existing reservoirs and watercourses. The water at these locations could be transferred to augment reservoirs and rivers to support abstraction.

Throughout the period of the Drought Plan, we will continue to work on increasing the level of detail we hold internally for each type of action and update the tables if necessary. We are also keen to explore the opportunity to include innovative trials and actions which is why we have setup a drought innovation workstream

and have already met with companies from other parts of the world to discuss their drought management approach and actions, including the Southern Nevada Water Authority (United States) and Global Omnium (Spain).

Extreme actions have been developed to include a wide range of both demand and supply actions with some actions being a continuation of the actions set out in **Section 3.1 and 3.2 of the Main Plan**. However, they are instead applied to a more extreme extent and will be increasingly targeted on the possible areas at risk of Level 4 restrictions for a given scenario. For example, road tankering has been included as a possible extreme action but it is important to note that tankering can also be a standard action in some WRZs more at risk from drought.

Within all our reservoirs is a reserve of water known as emergency storage, which sits below Level 4. We currently plan to be resilient to a severe drought (1 in 200-year) without the use of emergency storage. However, should we find ourselves in Level 4 restrictions, the use of emergency storage would be considered in our Emergency Drought Plan and could typically provide enough volume to supply an additional 30 days from the reservoir. Therefore, this action is not included within our extreme actions list.

The potential environmental effects of each action listed in the summary table are assessed as part of our Strategic Environmental Assessment (SEA). Within the SEA framework, the extreme actions are treated as a distinct tier of drought actions, reflecting their deployment only under the most severe and prolonged drought conditions. Their assessment therefore focuses on the potential scale and intensity of effects, reflecting the exceptional circumstances in which they may be used. To ensure a consistent approach, the SEA applies the same appraisal framework to the extreme actions as to all other drought actions to allow for comparative assessment to support decision-making. Importantly, the SEA includes a residual-effects matrix, which records the likely significant effects after the application of appropriate mitigation and best practice measures.

The SEA found that the extreme communications plan, water efficiency, and customer metering have generally minor adverse effects but provide significant benefits by helping people use less water and protecting the environment. Tariffs, extreme pressure management, and extreme targeted leakage reduction can have moderate adverse effects on some households and businesses. Removing exceptions has the most significant potential adverse effects, affecting water-reliant sectors, but may be necessary in extreme droughts to protect

essential supplies. Extreme supply actions generally cause short-term, minor to moderate disturbance while significantly improving water availability, with advanced recycling and temporary treatment offering the greatest benefits.

Environmental monitoring and associated timeframes will be considered for each action as options are developed into specific operational measures. Extreme actions will continue to be reviewed through the SEA process, alongside further work on prioritisation of actions, taking into account operational constraints, SEA findings and customer preferences.

The action types summarised in the tables below are those which we will develop further, in consultation with the Environment Agency, Natural England, Historic England, Drinking Water Inspectorate and other stakeholders where appropriate.

### 3. Updates to Extreme Action tables

A number of potential actions including two that were in the Drought Plan 2022 extreme actions table were screened out due to impracticality and technical infeasibility. The two extreme actions that have been removed from the previous table and the reason why they were screened out are below:

- **Sea tankering** - Screened out due to disproportionately high cost of building temporary pipelines from a small select number of ports, storage, treatment and connectivity to the network. The logistics of distributing water by road tanker were also considered and there is insufficient fleet to effectively distribute and deploy enough resource to have a material benefit. Containerised options are too small to have a material benefit over UK based sources, and the product available is raw water, so not suitable for consumption. These issues, alongside difficult to resolve invasive non-native species (INNS) risks make this option impractical to implement in a short timescale. If these issues are resolved in future, the option can be reconsidered.
- **Desalination (mobile plants)** - Screened out due to the impracticality of constructing temporary abstraction and brine discharge pipelines to the sea, alongside the associated consenting requirements. In addition, there is a current lack of Regulation 31-approved reverse osmosis membranes, and it is unlikely that the necessary updates to water regulations would be completed in time to make temporary desalination a feasible option within the lifetime of this plan (2027-2032). Once the Regulation 31 constraints are resolved and the necessary regulatory framework is in place, mobile desalination will be reconsidered as a potential future option.

A number of extreme actions were updated as part of the review. Some of the key changes made between Drought Plan 2022 and Drought Plan 2027 are summarised below:

- **Metering (standard) and metering (smart)** - included in the combined action type of **Water Efficiency & Customer Metering**, this terminology reflects our WRMP24. Our smart meter roll out plan is due to be completed during AMP8.
- **Household (HH) incentivisation & Non-Household (NHH) incentivisation** - these action types have been combined. They are now referenced in two separate rows relating to **Water Efficiency & Customer Metering** and **Tariffs**. In a level 3b scenario we will apply actions across HHs and NHHs as appropriate.
- **District metering** - included in the **Extreme Targeted Leakage Reduction** (formally known as Leakage) action row, this change reflects the terminology

in our WRMP24 and the updated leakage approach using P.A.L.M. (Prevent, Awareness, Locate and Mend).

- **Further optimise activities that reduce raw water losses** - this sub action has been moved from the demand to the supply table and is now referred to as **Loss Reduction**. This activity relates to raw water prior to the output of the treatment process therefore it relates to the supply related extreme actions.
- **Repurpose groundwater river support sources** - this action is an evolution of an existing action for **River Support**. The aim of this standalone action is to use river support sources to maintain public water supply.

## 4. Extreme action table structure and metrics

In the tables below, the overarching **Action type** is stated and where required further defined in the **Action summary** into the different type of actions that might be available.

From the WRMP24 we have 27 WRZs. Further information on the WRZ characteristics can be found in **Appendix 1**. The **WRZ characterisation** column allows us to identify which areas are relevant for that action type. These are split into four types:

- All
- Groundwater (GW)
- Surface water (SW)
- Coastal

We have also characterised the **Headline** benefit into three types:

- Maintain Supply - signifies that the action enables us to keep a consistent DO.
- New Source of Supply - actions enable us to temporarily increase DO to support an area.
- Reduce Demand - actions aim to influence behaviour and reduce the demand on our supply network.

The **Likely Benefit** and **Likely Barrier** columns give qualitative opportunities and risks for each action, as described by the subject matter experts and stakeholders that the actions were developed with. The **Likely Barriers** have been categorised into:

- Regulatory
- Social
- Technological
- Operational
- General

The **Volumetric Benefits** were developed by the subject matter experts, the summarised volumetric benefits are based on a range of specific scenarios to provide a qualitative view of the benefit. The volumetric benefits are split into five types:

- Substantial = 5
- Major = 4
- Moderate = 3
- Minor = 2
- Negligible = 1

The **Environmental Impact** for each extreme action type was developed using a scoring methodology. It combined impact severity categories including, volumetric assessments, risk multipliers, and construction-related considerations to generate a comparative score for each action. Together, these components ensure that each option is evaluated using a proportionate approach, that captures both the scale of environmental influence and the specific risks posed by different types of intervention. The scores are grouped into the impact category scale below:

- Beneficial\*
- Negligible
- Minor
- Moderate
- Major

*\*Beneficial effects are captured to ensure positive environmental outcomes are fully recognised.*

The **Lead Time** notes the estimated time required to make that action operational. The total lead time should also include enough time to see the benefits of the action. A time range has been provided as it summarises the lead time required for different action scenarios. For this iteration of the table the lead time has been broken down into preparation, delivery and total. We are able to identify potential droughts in our region at an early stage, allowing significant planning time before these actions are needed. The lead times for each action will feed into decisions on when or whether or not an action is triggered for progression and implementation.

The last column in the table is **Implementation Priority** which is categorised into Low, Medium or High. This was developed alongside the subject matter experts and takes into account a combination of factors including the WRZ characterisation, likely barriers and benefits, implementation readiness, the volumetric benefits, environmental impacts and lead time.

We will always prioritise the use of demand actions first before supply actions are implemented. However, due to the variability of a drought, and the changing intricacies of each WRZ, the exact order and prioritisation of the implementation of extreme actions will be reviewed on a case-by-case basis to determine what strategy is the most beneficial to a specific WRZ during a given scenario. This review will be carried out by subject matter experts within the Drought Management Team and will identify more precisely the possible quantitative benefits, as well as any environmental impacts and barriers to implementation. Actions that are least environmentally damaging and implementation ready will be prioritised ahead of others.

For all extreme actions identified we would ensure compliance with the relevant water quality regulations and that any impacts to customers (including acceptability of water) are fully assessed and managed. As noted previously due to the characteristics of the Anglian Water region, we are able to identify a potential oncoming drought at an early stage, allowing for planning time. This time also allows us to discuss our plans and carry out full environmental assessments when appropriate with the Environment Agency, Natural England, Historic England and other key stakeholders, including the Drinking Water Inspectorate.

# 5. Extreme Demand Actions

Table 5.1 Extreme Demand Actions

Action type	Action summary	WRZ characterisation	Likely Benefit Headline	Likely Benefit Description	Volumetric Benefit	Likely Barriers	Environmental Impact	Lead Time - Preparation	Lead Time Delivery	Lead Time Total	Implementation priority
<b>Extreme Communications Plan</b>	<ul style="list-style-type: none"> <li>- Keep customers aware of current storage situation</li> <li>- Focus on biggest potential areas for saving (e.g. toilets and showers, discretionary use)</li> <li>- Excessive water use seen as unacceptable</li> <li>- Involved in national campaigns to change culture</li> <li>- Guides for customers to show how to restrict water use to for example 50 litres/person/day</li> <li>- Hard hitting messages and images</li> <li>- Utilise smart meter intelligence to understand characteristics and distributions of high usage customers by zone and drive tailored communications</li> <li>- Drive communications via smart meter MyAccount engagement</li> </ul>	All	Reduce demand	<ul style="list-style-type: none"> <li>- May change customer behaviours over the long term and even after the drought has ended</li> <li>- Additional benefit from smart meter data analysis and comms, and the power of word of mouth</li> </ul>	Minor = 2	<b>Social</b> - Difficulty in balancing need for severe restrictions with public engagement / involvement	Beneficial	< 3 months	< 1 month	< 4 months	H
<b>Extreme Water Efficiency &amp; Customer Metering</b>	<ul style="list-style-type: none"> <li>- Enhance use of smart meter data:</li> <li>- Increase frequency of messaging based on smart meter readings via customer contact channels</li> <li>- Utilise smart meter consumption data to analyse user groups by zone and distributions - tailor activities</li> <li>- Stronger campaigns around actions that make a difference (e.g. leaky loos)</li> <li>- Increase the regularity of water balance updates</li> <li>- Understand demand in more detail (by DMA, postcode, etc.)</li> <li>- Able to store greater data for increased reporting / trend spotting</li> <li>- Help create a real time model</li> <li>- Enhance continuous flow reduction (based upon smart meter data analysis). Additional support for longer duration customer leakage</li> </ul>	All	Reduce demand	<ul style="list-style-type: none"> <li>- May change customer behaviours over the long term and even after the drought has ended</li> <li>- Additional benefit from smart meter data analysis and comms, and the power of word of mouth</li> <li>- Reduction in continuous flow driven by smart meter data analysis</li> </ul>	Minor = 2	<b>General</b> - GDPR issues - legitimate interest for non-consent customers <b>General</b> - Multiple Channels - How do we communicate it - customer journey	Beneficial	< 1 month	< 1 month	< 2 months	H
	<ul style="list-style-type: none"> <li>- Set specific targets for customers:</li> <li>- Stronger campaigns around actions that make a difference (e.g. leaky loos)</li> <li>- Increasing frequency of emails (monthly to weekly) explaining the community demand and the challenges / targets</li> <li>- Target will be dependent on scenario. An extreme scenario would be to lower PCC for example 50 litres/person/day</li> </ul>	All	Reduce demand	<ul style="list-style-type: none"> <li>- May change customer behaviours over the long term and even after the drought has ended</li> <li>- Additional benefit from smart meter data analysis and comms, and the power of word of mouth</li> </ul>	Minor = 2	<b>General</b> - GDPR issues - legitimate interest for non-consent customers <b>General</b> - Multiple channels - How do we communicate it - customer journey <b>General</b> - Increasing frequency of emails requires cost and functionality	Beneficial	< 3 months	< 1 month	< 4 months	H
	<ul style="list-style-type: none"> <li>- Incentivisation:</li> <li>- Provide financial reward to customers who reduce their water usage</li> <li>- Incentivise water efficiency schemes (e.g. additional storage creation and leak fixing)</li> </ul>	All	Reduce demand	<ul style="list-style-type: none"> <li>- May change customer behaviours over the long term and even after the drought has ended</li> <li>- Additional benefit from smart meter data analysis and comms, and the power of word of mouth</li> <li>- Extra storage and reduction in leakage reduces demand on our system</li> <li>- Could mean industrial users temporarily utilise public water supply rather than their own, allowing more effective catchment operation</li> </ul>	Minor = 2	<b>Regulatory</b> - Regulator approval required as part of an expedited process <b>Social</b> - Too large an incentivisation (in the form of a prize) can have a negative uptake as it feels unachievable <b>Social</b> - Ability to influence some users <b>General</b> - Large incentivisation would likely benefit low occupancy households and feel unachievable for households with high occupancy <b>General</b> - Disrupting the NHH user process <b>General</b> - Engaging with our NHH users early enough	Beneficial	< 6 months	< 6 months	< 12 months	M

Action type	Action summary	WRZ characterisation	Likely Benefit Headline	Likely Benefit Description	Volumetric Benefit	Likely Barriers	Environmental Impact	Lead Time - Preparation	Lead Time Delivery	Lead Time Total	Implementation priority
Tariffs	<ul style="list-style-type: none"> <li>- Provide enhancements on existing seasonal tariffs</li> <li>- Provide lower tariffs to customers who reduce their water usage</li> <li>- Explore NHH tariff options to manage demand</li> </ul>	All	Reduce demand	<ul style="list-style-type: none"> <li>- May change customer behaviours over the long term and even after the drought has ended</li> <li>- Additional benefit from smart meter data analysis and comms, and the power of word of mouth</li> </ul>	Minor = 2	<p><b>Regulatory</b> - Regulator approval required as part of an expedited process</p> <p><b>Regulatory</b> - Enforcement - current powers not legally binding</p> <p><b>Social</b> - Ability to influence some users</p> <p><b>Social</b> - If tariffs are raised too high, some customers may not be able to pay</p> <p><b>General</b> - Disrupting the NHH user process</p> <p><b>General</b> - Engaging with all users early enough</p> <p><b>General</b> - Providing enough incentivisation or making the action easy enough to implement</p>	Beneficial	< 6 months	< 6 months	< 12 months	M
Extreme Pressure Management	Enhancing existing pressure management activities to the lowest possible level	All	Reduce demand	<ul style="list-style-type: none"> <li>- Reduce background leakage</li> <li>- Reduce consumption</li> <li>- Pipe burst performance would be better in the shorter term</li> <li>- Can replace need for rota cuts - a better way to control demand and can be done remotely so less people needed on the ground</li> <li>- Reduce discolouration risk due to lower pressures</li> </ul>	Minor = 2	<p><b>Regulatory</b> - Breaching minimum standards of pressure delivery but reduces loss of water</p> <p><b>Social</b> - Communicating the need of these measures and explaining how it works to customers</p> <p><b>Operational</b> - Requires effective planning before being needed which may increase lead times</p> <p><b>Operational</b> - Availability of assets in the impacted areas</p> <p><b>Operational</b> - Need to understand any water quality risks and how these could be managed</p> <p><b>Operational</b> - Need to understand and plan how the system is returned to normal pressures to mitigate potential water quality risks (e.g., potential for discolouration) and bursts</p> <p><b>Operational</b> - Problems for larger and more vulnerable users e.g. industry and hospitals &amp; customers with medical needs</p> <p><b>Operational</b> - Consideration would need to be given to pressure at hydrants (for which we would liaise with local fire services as requested by Part 5 of the 2004 Fire and Rescue Services Act)</p> <p><b>General</b> - May cause further bursts and other issues in the longer term if pressure reductions are reversed</p>	Beneficial	< 3 months	< 4 months	< 7 months	M
Extreme Targeted Leakage Reduction	Refocus, increase resources, and enhance leakage activities using P.A.L.M (Prevent, Awareness, Locate and Mend)	All	Reduce demand	<ul style="list-style-type: none"> <li>- Increased maintenance and repair of assets (i.e., district metering) to ensure accurate reporting and network management (Prevent &amp; Awareness)</li> <li>- Increased leakage reporting (Prevent &amp; Awareness)</li> <li>- Reduced time for leak detection &amp; inspection (Locate), and repairs (Mend)</li> <li>- Maintain supply through increased resource support for mains repair activities and storage point management</li> <li>- Enhanced customer communications regarding smart meter identified customer supply pipe leakage</li> <li>- Fix pipes and leaks for customers even when outside remit</li> </ul>	Minor = 2	<p><b>Operational</b> - Adding time on to previous planned leakage programmes</p> <p><b>Operational</b> - Increasing repair capacity - availability of additional resource</p> <p><b>Operational</b> - Need to understand any water quality risks and how these could be managed</p> <p><b>Operational</b> - Availability of assets in the impacted areas</p> <p><b>General</b> - Exposing the pipes to fix leaks can be an inconvenience to customers</p> <p><b>General</b> - Still a limit to how much we can drop our leakage figure</p> <p><b>General</b> - Stock replenishment as other water companies likely to be impacted by same event</p> <p><b>General</b> - Logistics</p> <p><b>General</b> - Enforcement route to mend customer leaks</p>	Beneficial	< 3 months	< 3 months	< 6 months	M
Removal of restriction exceptions	Consideration of removal of all exceptions under any Temporary Use Bans (TUBs) or Non-Essential Use Bans (NEUBs) that are implemented	All	Reduce demand	<ul style="list-style-type: none"> <li>- Further reduce demand on top of the impact that the TUBs and NEUBs restrictions have already had</li> </ul>	Moderate = 3	<p><b>Social</b> - More of the customer base will be impacted by restrictions. Also green spaces (commercial gardens, golf courses) would no longer be included in the exceptions</p> <p><b>General</b> - Communicating these changes to customers and businesses</p> <p><b>General</b> - Financial impacts for affected users</p>	Beneficial	< 3 months	< 1 month	< 4 months	M

# 6. Extreme Supply Actions

Table 6.1 Extreme Supply Actions

Action type	Action summary	WRZ characterisation	Likely Benefit Headline	Likely Benefit Description	Volumetric Benefit	Likely Barriers	Environmental Impact Status	Lead Time Preparation	Lead Time Delivery	Lead Time Total	Implementation priority
Groundwater Support	Lower borehole pumps or increase size of borehole pump	GW	Maintain Supply	- Aim to maintain existing yield through period of stress	Minor = 2	<b>Operational</b> - Water quality, turbidity and potential increase in chemical parameters <b>Operational</b> - Adequacy of treatment <b>Operational</b> - Power for pump resizing & infrastructure on site	Negligible	< 1 month	< 6 months	< 7 months	H
	Increase borehole depth	GW	Maintain Supply	- Aim to maintain existing yield through period of stress	Negligible = 1	<b>Operational</b> - Need to risk assess and ensure CRAGS is up to date <b>Operational</b> - Water quality, turbidity and potential increase in chemical parameters <b>Operational</b> - Adequacy of treatment <b>Operational</b> - Unknown if increased depth has yield	Negligible	< 3 months	< 6 months	< 9 months	L
	Satellite boreholes	GW	New source of supply	- New source aiming to support existing yield / minimise impact on water levels through period of stress - Spread draw down impact on aquifer - decrease horizon flow impact	Major = 4	<b>Regulatory</b> - Licencing requirements <b>Regulatory</b> - DWI approval of treatment <b>Operational</b> - Need to risk assess and ensure CRAGS is up to date <b>Operational</b> - Water quality, turbidity and potential increase in chemical parameters <b>Operational</b> - Adequacy of treatment <b>General</b> - Land access and agreement	Major	< 4 months	< 12 months	< 16 months	M
	Recommissioning / Commissioning out-of-service boreholes	GW	New source of supply	- Piping unused sources elsewhere for treatment - River augmentation	Major = 4	<b>Operational</b> - Need to risk assess and ensure CRAGS is up to date <b>Operational</b> - Water quality, turbidity and potential increase in chemical parameters <b>Operational</b> - Adequacy of treatment <b>Operational</b> - Asset condition unknown <b>Operational</b> - Distance to existing infrastructure	Moderate	< 4 months	< 12 months	< 16 months	M
	Use of 3rd party boreholes	GW	New source of supply	- Spread water/abstraction - Retail customers may have their own dedicated boreholes - Irrigation or agricultural boreholes - Recommission of old private / industrial boreholes - Potential for groundwater trade	Minor = 2	<b>Regulatory</b> - Water Quality regulations e.g., Materials In Contact <b>Regulatory</b> - Historical data, lack of CRAGS <b>Social</b> - Water no longer available for other users, for example agriculture <b>Technological</b> - Electrical safety <b>Operational</b> - Need to risk assess and ensure CRAGS is up to date <b>Operational</b> - Water quality, turbidity and potential increase in chemical parameters <b>Operational</b> - Adequacy of treatment <b>Operational</b> - Infrastructure links to network <b>General</b> - Willingness of 3rd parties to form an agreement	Minor	< 3 months	< 15 months	< 18 months	L
	Repurpose river support boreholes	GW	New source of supply / Maintain Supply	- Use river support source to maintain public water supply	Minor = 2	<b>Regulation</b> - Environment Agency consents e.g. abstraction licences and discharge <b>Operational</b> - Adequacy of treatment <b>Operational</b> - Power for pump resizing & infrastructure on site <b>Operational</b> - Need to risk assess and ensure CRAGS is up to date	Moderate	< 4 months	< 12 months	< 16 months	M
River Support	Augmentation from boreholes close to rivers	All	Maintain Supply	- Increase the amount of water in the environment that can then re-abstracted for public water supply	Minor = 2	<b>Regulation</b> - Need to risk assess (SWRAs) and ensure CRAGS is up to date <b>Operational</b> - Water quality, turbidity and potential increase in chemical parameters <b>Operational</b> - Adequacy of treatment <b>Operational</b> - Actual yield gained <b>Operational</b> - Inability to abstract from river to gain the benefit <b>General</b> - Other abstractors taking the water	Moderate	< 3 months	< 4 months	< 7 months	L
Drought Permit and Orders	Temporary increases to licences that have been reduced or revoked and identification of new sources of water in areas at risk	All	Maintain Supply	- Ability to abstract above licenced volume to support public water supply via drought permit or drought order - For licences that have been reduced existing infrastructure and processes can be utilised. There is also proven yields and historical operation	Moderate = 3	<b>Regulatory</b> - Environmental monitoring may be limited in new areas of consideration <b>Regulatory</b> - Environment Agency consents e.g. abstraction licences and discharge <b>Regulatory</b> - WFD objectives <b>Operational</b> - Need to risk assess and ensure CRAGS is up to date <b>General</b> - Land owner agreement for overland piping	Moderate to Major	< 6 months	< 6 months	< 12 months	M
Temporary Treatment	UV disinfection	All	Maintain Supply	- Ability to utilise for other extreme actions where adequacy of treatment is a barrier - More effective at the end of the treatment works process - Wastewater return to head of works	Negligible = 1 to Substantial = 5	<b>Regulatory</b> - Water Quality regulations e.g., Materials In Contact <b>Operational</b> - WTW constraints e.g. footprint of site & connections <b>Operational</b> - Availability of temporary treatment equipment in extreme drought scenario <b>General</b> - Lead time for equipment	Negligible	< 1 month	< 1 - 11 months	< 1 - 12 months	H

Action type	Action summary	WRZ characterisation	Likely Benefit Headline	Likely Benefit Description	Volumetric Benefit	Likely Barriers	Environmental Impact Status	Lead Time Preparation	Lead Time Delivery	Lead Time Total	Implementation priority
	Nitrate removal and / or blending	All	Maintain Supply	- Ability to utilise for other extreme actions where adequacy of treatment is a barrier - Greater utilise sources used for blending - Develop additional blending options	Moderate = 3	<b>Regulatory</b> - Water Quality regulations e.g., Materials In Contact <b>Operational</b> - WTW constraints e.g. footprint of site & connections <b>Operational</b> - Availability of temporary treatment equipment in extreme drought scenario <b>General</b> - Lead time for equipment	Minor	< 9 months	< 12 months	< 21 months	M
	Iron / Turbidity removal	All	Maintain Supply	- Ability to utilise for other extreme actions where adequacy of treatment is a barrier - Utilise existing assets - Accelerate lead time	Moderate = 3	<b>Regulatory</b> - Water Quality regulations e.g., Materials In Contact <b>Operational</b> - WTW constraints e.g. footprint of site & connections <b>Operational</b> - Availability of temporary treatment equipment in extreme drought scenario <b>General</b> - Lead time for equipment	Minor	< 1 month	< 1 - 11 months	< 1 - 12 months	H
<b>Water Recycling</b>	Advanced water recycling, diverting recycled water so that it can support an existing abstraction point	All	Maintain Supply	- Adds resilience to river systems to allow abstraction to continue - Reduces environmental impact of abstraction	Moderate = 3	<b>Regulatory</b> - Environment Agency & Natural England consents e.g. abstraction licences and discharge <b>Regulatory</b> - Need to carry out full water quality risk assessment (DWSP) <b>Social</b> - Customer acceptance	Major	< 12 months	< 12 months	< 24 months	L
	Water re-use, diverting recycled water to support other water users	All	Maintain Supply	- Supports other water users and in turn increases the amount of water available in the environment for public water supply and reduces the demand for water	Minor = 2	<b>Regulatory</b> - Environment Agency & Natural England consents e.g. abstraction licences and discharge <b>Regulatory</b> - Need to carry out full water quality risk assessment (DWSP) <b>Social</b> - Customer acceptance	Moderate	< 12 months	< 12 months	< 24 months	L
<b>Overland pipes</b>	Installation of overland pipes in an extreme drought situation to distribute water to where it is needed the most	All	Maintain Supply	- Flexibility of network (across DZ, DMA or WRZ level) - Could be used to transfer potable or non-potable water - Mobile booster pumps will increase pressure	Major = 4	<b>Regulatory</b> - Traffic permits <b>Social</b> - Ensure any acceptability impacts to customers are understood and managed <b>Social</b> - Customer perception <b>Operational</b> - Length of pipe needed and availability of resources if there is a wider national extreme drought <b>Operational</b> - Above ground constraints (e.g. footpaths, road, rail) plus accessibility (e.g. wheelchair users, farmers fields, paths) <b>Operational</b> - Pumping constraints <b>General</b> - Landowner and stakeholder agreements <b>General</b> - Security risk (e.g. sabotage, theft or damage) <b>General</b> - Requires nearby areas to not already be under water stress	Major	< 1 month	< 3 months	< 4 months	H
<b>Tankering</b>	Movement of water via road tankers in an extreme drought situation to distribute water to where it is needed the most	All	Maintain Supply	- Flexibility of network (across DZ, DMA or WRZ level) - Could be used to transfer potable or non-potable water - Can tailor/target to vulnerable & critical NHH	Major = 4	<b>Social</b> - Ensure any acceptability impacts to customers are understood and managed <b>Operational</b> - Distance travelled, driver hours, vehicle access and parking <b>General</b> - Requires nearby areas to not already be under water stress <b>General</b> - Competition for resources if there is a wider national extreme drought	Moderate	< 1 month	< 1 month	< 2 months	H
<b>Utilising other significant water bodies</b>	Potential to use 3rd party bodies of water	All	New source of supply	- New source aiming to support existing yield / minimise impact on water levels through period of stress - Utilisation for river augmentation and to mitigate any environmental impact - Offset non-potable supply to reserve resource for public water supply	Minor = 2 to Moderate = 3	<b>Regulatory</b> - Need to carry out full water quality risk assessment (DWSP) <b>Social</b> - Ensure acceptability impacts to customers / general public are understood and managed (non potable water) <b>Operational</b> - Connectivity to network <b>Operational</b> - Adequacy of nearby treatment	Moderate	< 6 - 12 months	< 6 - 12 months	< 12 - 24 months	M
<b>Supply schemes</b>	Acceleration of strategic options outlined in WRMP and business plans	All	New source of supply	- Bringing new water sources or ways of distributing water online in a quicker fashion to support areas of risk e.g. changing the phasing of the Strategic Interconnector Programme - Increase the efficiency of partially / fully completed planning processes	Major = 4	<b>Regulatory</b> - Need to carry out full water quality risk assessment (DWSP) <b>Operational</b> - Above ground constraints (e.g. road and rail) <b>General</b> - Only available to areas that are planned to be supported by an existing programme (e.g. Interconnector Programme) <b>General</b> - Timeframe for implementation <b>General</b> - Resource availability <b>General</b> - Availability of assets required for build if build is accelerated	Major	< 4 months	< 8 months	< 12 months	H
<b>Resource trading and transfers</b>	Short term trades between companies / sectors. Plans to increase / decrease bulk supplies	All	New source of supply	- Could utilise effluent re-use schemes from other suppliers - Customer with potable supply can change for non potable source to offset potable water demand	Moderate = 3 to Major = 4	<b>Regulatory</b> - Need to carry out full water quality risk assessment (DWSP) <b>Regulatory</b> - Agreeing temporary or flexible licencing arrangements <b>Operational</b> - Network connectivity <b>Operational</b> - Would require a control regime <b>General</b> - Water availability from other suppliers	Minor to Moderate	< 1 - 6 months	< 1 - 6 months	< 2 - 12 months	M
<b>Loss Reduction</b>	Further optimise activities that reduce raw water losses	All	Reduce demand	- Reduce the amount of water lost in the raw water process - maximising the water available	Minor = 2	<b>Operational</b> - WTW treatment constraints <b>General</b> - Exposing the pipes to fix leaks can be an inconvenience to customers	Negligible to Major	< 3 months	< 9 months	< 12 months	M



Anglian Water Services Limited

Lancaster House

Lancaster Way

Ermine Business Park

Huntingdon

Cambridgeshire

PE29 6XU

[anglianwater.co.uk](http://anglianwater.co.uk)