# Drought Plan 2022

# Habitats Regulations Assessment Report

# Part C: HRA Stages 3 and 4

Publication date: August 2025


from Southern Water

# Contents

# PART C – Stages 3 and 4 Alternative options, IROPI and compensation measures

## Introduction to HRA Stage 3 and Stage 4

As set out in Section 6 of the HRA Report (see separate document), the Stage 2 Appropriate Assessments of the Candover Augmentation Scheme and the Lower Itchen sources Drought Orders were unable to conclude that there would be no adverse effects on site integrity of the River Itchen SAC. However, the changes being made to the Lower Itchen sources and Candover Augmentation Scheme abstraction licence conditions mean that essential water supplies to customers in the Hampshire Southampton East Water Resource Zone cannot be secured in severe drought conditions without recourse to the Candover Augmentation Scheme Drought Order or the Lower Itchen sources Drought Order.

In view of the current and forecast short-term (to 2027[1]) supply-demand deficit in the Hampshire Southampton East WRZ in severe drought conditions as set out in the WRMP19, Southern Water is not able to remove these two Drought Orders from the final Drought Plan. The absence of these Drought Orders over the lifetime of the Drought Plan would lead to an increased risk of requiring an Emergency Drought Order to be sought from the Secretary of State to ration water supplies using rota cuts or standpipes in a drought severity of greater than 1 in 200 years. It is not considered acceptable to plan for an Emergency Drought Order for drought events at or less than in a 1 in 500 year severity given the major public health and safety issues, as well as social and economic impacts, arising from implementation of an Emergency Drought Order.

There is no guarantee that any of the potential drought permits or orders included in this plan will be needed and if so, would be granted, and each application we make would need to be assessed by the Environment Agency, Natural England and Defra (as appropriate). Such applications would be accompanied by a project level HRA.

It is therefore important to distinguish between the adoption of a drought plan and implementation of the individual drought options (drought permits and drought orders) contained within a drought plan in this context. Many finalised water company drought plans include options that, if implemented, could potentially affect a European site. These plans have been adopted on the basis that, should those options ever be needed, the project level HRA would assess any impacts in the context of conditions prevailing at that time. This means that the latest hydrological and ecological data could be used, any proposed mitigation considered, and the expected duration and extent of the additional abstraction taken into account.

The July 2024 project level HRA Appropriate Assessment (AA) of the River Test Drought Permit concluded that there was no likely significant effect for all European sites except for the River Itchen SAC. It found that for "*the River Itchen SAC, the assessment concludes that adverse effect on integrity cannot be excluded with certainty, at this juncture, with the various mitigation measures, as proposed. Further discussion with the EA on the mitigation measures is welcomed to progress this assessment*."

These ongoing discussions with regulators relating to the River Test surface water drought permit project level HRA indicated that the EA did not consider the mitigation proposed to be sufficient to prevent any potential adverse effects. Adopting the precautionary principle in relation to what may be functionally linked habitat, we have decided that this project level HRA will now progress to

[1] This drought plan is intended to cover the period 2022 to 2027

stage 3 and, if required, stage 4 of the HRA process. We wrote to the EA on 21 November 2024 to confirm this decision. This is part of the 'application ready' principles that we adhere to should such a drought option be needed in the future.

This process will need to be finalised before any River Test Drought Permit can be granted and implemented. We are currently expecting to conclude this process by summer 2025 and set out an indicative timeline for the process in table 4-7 of the main drought plan report. We shared this indicative timeline with the EA in December 2024. We will update the EA on the latest position with the project level HRA via the annual review process however we do not expect this ongoing process with the project level HRA to impact upon the finalisation of this drought plan.

The sequential tests forming Stages 3 and 4 of the HRA process (as set out in national HRA guidance) and are discussed in the following sections.

# Stage 3: Consideration of alternative options

In accordance with Article 6(4) of the Habitats Directive and national HRA guidance, Stage 3 of the HRA process requires the consideration of reasonable alternative options which may negate or mitigate the need for the Candover Augmentation Scheme and Lower Itchen sources Drought Orders. The consideration of alternatives can be limited to options which are financially, legally and technically feasible.

As described earlier in this HRA Report, various measures have been included in the Draft Drought Plan 2022 to help maintain essential water supplies to the Hampshire Southampton East WRZ in drought conditions (beyond "normal" operational measures) and these would be implemented by Southern Water before implementing the Candover Augmentation Scheme Drought Order or the Lower Itchen sources Drought Order. These measures are summarised in **Table 8.1**. Many of these measures are specifically included in the Section 20 Agreement which sets out the sequencing and actions to be taken in advance of implementing these two Drought Orders.

**Table 8.1 Drought Plan measures that would be in place prior to implementation of the Candover Augmentation Scheme and Lower Itchen sources Drought Order in the Hampshire Southampton East WRZ**

| Measures that would be in place in advance of the Candover Augmentation Scheme Drought Order or Lower Itchen sources Drought Order | |
|---|---|
| 1. Utilisation of Southern Water sources and existing bulk supplies | Maximise use of all available sources within abstraction licence, regulatory and operational constraints |
| | Maximise Portsmouth Water treated water bulk supply to the WRZ (15Ml/d) |
| 2. Level 1 Water Use Restrictions and demand management measures | Escalate demand-side water efficiency measures including media campaigns to encourage water efficiency and to raise awareness of the impending drought |
| | Initiate discussions with local authorities regarding watering regimes for public parks and gardens |
| | Increase leakage monitoring and repair activity |
| | Mains pressure reduction activities to help reduce leakage and peak demand consumption |
| 3a. Level 2 Water Use Restrictions and demand management measures | Implement Temporary Use Ban - Phase 1 (unless it is agreed with the Environment Agency that it is unnecessary because it will only result in minimal savings) |
| | Enhanced media campaign to publicise water use restrictions and further encourage water savings |
| 3b. Maximise transfers from Hampshire Rural WRZ | Transfer ~0.5Ml/d from Hampshire Rural WRZ |
| 4. Test Surface Water Drought Permit | Implement Test Surface Water Drought Permit to help continue maximising treated water transfers from Hampshire Southampton West WRZ to Hampshire Southampton East WRZ |
| 5. Level 3 Water Use Restrictions | Apply for a Drought Order to authorise partial (Phase 1) non-essential water use restrictions |

Once the measures set out in Table 8.1 have been implemented, Southern Water will consider which Drought Orders are to be implemented to maintain supplies to the Hampshire Southampton East WRZ. In line with the Drought Plan principles of minimising the effects of drought management measures on the environment, Annex 1 to the Section 20 Agreement confirms that Southern Water will take into account ecological considerations when deciding the order of implementation of the Test Surface Water, Candover Augmentation Scheme and Lower Itchen sources Drought Orders. In particular, the potential vulnerability of fish seasonally because of their migration patterns will be considered. Southern Water will liaise with the Environment Agency using the most up-to-date monitoring information on macrophytes and invertebrates and having regard to its statutory supply

duties, available sources and other statutory obligations (including those of the Habitats Directive), to agree which course of action is the most appropriate at that time.

The Level 3 Temporary Use Ban Phase 2 water use restrictions and Phase 1 and Phase 2 of the Non-Essential Use Ban Drought Order (subject to Secretary of State approval) would be implemented when river flows fall below 200Ml/d near Eastleigh, as set out in Annex 1 of the Section 20 Agreement.

With all reasonable alternative options maximised to reduce demand on the River Itchen sources or to support the Hampshire Southampton East Water Resource Zone, the Candover Augmentation Scheme Drought Order would be implemented ahead of the Lower Itchen sources Drought Order. Water resources modelling has shown that the Candover Augmentation Scheme Drought Order would only be implemented in a 1 in 60-80 year severity drought. The Lower Itchen sources Drought Order would only be implemented in a 1 in 200 to 1 in 300 year severity drought.

We have considered other alternative options to the Candover Augmentation Scheme and Lower Itchen sources Drought Orders but these were rejected as summarised below. In considering other feasible alternative options, the option must be capable of further reducing demand for water or delivering some, or all, of the potential supply deficit that could arise in a severe drought in the Hampshire Southampton East Water Resource Zone.

1. “Do nothing” option – this has been rejected as it is not an acceptable alternative solution since it fails to meet the objective stated above and would lead to the implementation of an Emergency Drought Order to ration water supplies through use of standpipes and/or rota cuts.

2. Options that were discounted on the basis that they are likely to have an equal or greater impact on the site integrity and features of a designated European site when compared to the Lower Itchen sources Drought Order are:

    - Drought Order for temporary abstraction from alternative groundwater or surface water locations within the Lower River Itchen catchment (with construction of temporary pipelines to Southern Water treatment facilities)

3. Options discounted due to the timescales required for implementation are set out in Table 8.2 below. These include options where the expected timescale for implementation is (a) beyond the lifetime of the Drought Plan and/or (b) cannot be delivered in the timeframe of a drought once drought conditions have become apparent. Timescales were investigated as part of the development of the Southern Water WRMP19. Further details are provided in Appendix B.

**Table 8.2 Alternative options rejected due to the timescales required for implementation**

| Alternative options where timescales constrain implementation | Reason for rejection |
|---|---|
| Permanent desalination plant to meet deficit in severe drought | Planning, design and development timescales are beyond the lifetime of the Drought Plan |
| Additional bulk water imports from neighbouring water companies | Discussions with neighbouring companies, including through the Water Resources South East group, indicate that no additional bulk supplies are available during the lifetime of the Drought Plan |
| Additional abstraction from the River Test under a second Drought Order with a pipeline to the Lower Itchen Water Supply Works | This option could not be delivered during a drought under Drought Order powers as the timescales required for construction are too long. |
| Engineering works to develop new water sources | Planning, design and development timescales are beyond the lifetime of the Drought Plan |

| Alternative options where timescales constrain implementation | Reason for rejection |
|---|---|
| Indirect wastewater recycling | Planning, design and development timescales are beyond the lifetime of the Drought Plan |

4. Options discounted as being infeasible are set out in Table 1.3, including due to lack of reliable available supplies in drought conditions, regulatory constraints, engineering feasibility and/or physical operational constraints. Further details are provided in Appendix B.

**Table 1.3 Alternative options rejected as infeasible**

| Alternative Options assessed as infeasible | Reason for rejection |
|---|---|
| Reduce supplies to the Isle of Wight from the mainland to enable increased support from the Hampshire Southampton West WRZ to Hampshire Southampton East WRZ | No spare water available on Isle of Wight in a severe drought even with Drought Orders in place to increase abstraction. |
| Construction of new satellite boreholes at existing licensed boreholes | Reliable supplies from the existing boreholes that could support the Hampshire Southampton East WRZ are constrained by the abstraction licence limits and therefore development of satellite boreholes would not result in any increase in water supply availability. |
| Temporary desalination plant to supply Southampton East WRZ | Operationally infeasible due to the logistics of getting treated water from the temporary desalination plant in Southampton Water to the Southampton East water supply network via Southampton Common service reservoir using the existing water supply system. * . |
| Water tankering | The supply deficit of 33Ml/d cannot be met by water tankering.<br>A practical upper maximum of ~3.5Ml/d might be feasible for the WRZ. |

* We have removed a reference to Fawley desalination plant because this scheme is no longer going ahead.

5. Options assessed as having an unacceptable impact and that therefore should not reasonably be considered as alternative options are set out below:

   **Emergency Drought Order to ration water supplies** through the use of rota cuts and/or standpipes. It is considered unacceptable and unreasonable to implement an Emergency Drought Order in advance of the Candover Augmentation Scheme and Lower Itchen sources Drought Orders given the public health and safety, social and economic impacts that would arise as a consequence of water rationing. The Emergency Drought Order would affect a population of some 400,000 people.

   Whilst water rationing has historically been used in some severe droughts in parts of the UK (notably the 1976 drought), in more recent decades water companies, customers, regulators and Government have all considered such measures to be an unacceptable planned approach to managing water supplies in severe drought. Following the 1995 Emergency Drought Order application by Yorkshire Water, objections were raised by public health professionals and the Drinking Water Inspectorate as to the high risks of bacteriological contamination and associated disease that could arise as a consequence of prolonged reliance on standpipes or rota cuts, as well as the difficulties that would arise in the local communities affected. Objections were also raised by the local Fire Service Authorities.

   An Emergency Drought Order to ration water supplies through the use of standpipes and/or rota cuts is therefore not acceptable in a severe drought up to and including a 1 in 500 year severity drought.

The requirement for both the Candover Augmentation Scheme and Lower Itchen sources Drought Orders will be reduced in the longer term (from 2027) through measures proposed in Southern Water's Water Resources Management Plan 2019 that will improve the supply resilience of the Hampshire Southampton East WRZ in severe drought. However, the necessary measures cannot be implemented during the lifetime of the Drought Plan 2022 and will likely take until 2027 before they can be implemented.

It is therefore concluded that there are **no other feasible and acceptable alternative options** which may negate or mitigate the need for the Candover Augmentation Scheme and Lower Itchen sources Drought Orders during the lifetime of the Drought Plan 2022.

# Imperative Reasons of Overriding Public Interest

Article 6(4) of the Habitats Directive provides a derogation provision whereby if the relevant competent authority is satisfied that, there being no alternative solutions, a plan or project must be carried out for imperative reasons of overriding public interest ("IROPI"), it may agree to the plan or project notwithstanding a negative assessment of the implications for a European site. Where a site hosts priority natural habitats or species, the available reasons are limited to those relating to human health, public safety or beneficial consequences of primary importance to the environment, unless the competent authority obtains and has regard to an opinion from the European Commission. Where there are no priority habitats or species, the reasons may be of a social or economic nature.

In relation to the River Itchen SAC and the proposed drought orders, there are **no** priority habitats or species included within the River Itchen SAC designation. The competent authority can therefore consider other imperative reasons of overriding public interest, including those relating to social or economic benefit, in addition to those of human health, public safety, or beneficial consequences of primary importance to the environment.

In order to be capable of justifying the implementation of a plan or project, an interest must be of such importance that it can be weighed against the Habitats Directive's objective of the conservation of natural habitats and wild fauna and flora. European and domestic caselaw has established that protection of the supply of drinking water and irrigation can in principle constitute an overriding interest. Caselaw also shows that, where the site does not contain priority habitats or species, the protection of the local economy from harm – and even the generation of new social and economic benefits for a locale – can constitute an overriding interest.

Where an interest which is in principle capable of being overriding has being identified, it must be weighed against the damage caused to the site by the plan or project in question. Accordingly, applying the IROPI derogation involves a balancing exercise between the social and economic importance of abstraction versus the environmental damage caused. This exercise is fact specific. It may be easier to demonstrate IROPI where the proposal is of a regional or national scale, because the public interest in going forward may be very great. That said, simply because the project is relatively modest does not mean that there will not be IROPI if, for example, the adverse impact on the site is negligible or very small.

When identifying IROPI, each of the different elements of the term need to be assessed:

- **Imperative**: it must be essential (whether urgent or otherwise), weighed in the context of the other elements below, that the plan or project proceeds
- **Overriding**: the interest served by the plan or project outweighs the harm (or risk of harm) to the integrity of the site as identified in the Appropriate Assessment
- **Public Interest**: a public benefit must be delivered rather than a solely private interest. Public interest can occur at national, regional or local level.

The key principles that underpin the IROPI case for the Candover Augmentation Scheme and Lower Itchen sources Drought Orders are set out below.

Key principles:

- Maintaining public water supplies to customers in the Southampton East WRZ during a severe drought of up to and including a 1 in 500 year severity without recourse to standpipes or rota cuts can constitute an overriding public interest.

- The costs to businesses and household customers of rota cuts and standpipes outweigh the environmental effects of the Lower Itchen Drought Order.

These key principles support the elements of the IROPI "test" as set out below.

IROPI test:

Subject to the prioritisation of the drought orders (as discussed in Section 8), the need for either the Candover or the Lower Itchen sources Drought Order can be directly linked to adverse economic effects:

= **Imperative** – the measure is urgent due to the relatively short timescales with which river flows in the River Itchen can decline and remain below the hands-off flows (HoFs) near Southampton and near Eastleigh in a severe drought. The measure is essential as, without its implementation in severe drought, once flows in the River Itchen fall below the HoF conditions, the maintenance of essential public water supplies to customers will start to fail within the Hampshire Southampton East WRZ.

= **Overriding** – the likely harm to the public and economic impact to businesses in the Southampton East WRZ outweighs the harm to the designated site. The likely harm to the public includes risks to human health (i.e. risks of bacteriological contamination of water supplies and risks of water-borne diseases). Risks involved in carrying and storing water due to rota cuts or standpipes, as well as the risks posed to water supplies for fire-fighting and other safety requirements (i.e. risks to public safety) is overriding. The economic costs of rota cuts and standpipes are also unacceptable and overriding when weighed against the harm to the designated site.

= **Public interest** - the harm is to the public not to a private interest.

Further details to support the IROPI case are set out in the following sub-sections.

***Public water supply can be an overriding interest***
As set out above, protection of the supply of drinking water and irrigation can in principle constitute an overriding interest.

***Economic costs***
In the absence of a drought order being granted, the economic costs to businesses and local residents of water rationing using rota cuts and/or standpipes (through an Emergency Drought Order) would be very substantial. Economic assessment by Vivid Economics (commissioned by Southern Water in 2017) has indicated that the estimated daily costs of rota cuts and stand pipes would be of the order of:

- £23 million in business losses per day

- £29 million in costs to households per day (quantifying the economic loss suffered by households on the basis of what households would be willing to pay to reduce risk of water supply interruptions).

***Risk of environmental harm to the SAC***
Assessing whether the public interest in securing public water supplies to the Hampshire Southampton East WRZ in drought conditions outweighs the risk of harm to the River Itchen SAC requires a weighing up or balancing of the adverse environmental impacts of the proposed drought orders against the public interest benefits of the proposed drought orders so as to assess whether the benefits justify the adverse impacts. In order to carry out this balancing exercise, it is necessary to consider the likelihood of any harm to the SAC, as well as the likely extent of harm and its duration.

The Appropriate Assessments presented earlier in this HRA report concluded that it could not be shown that the Candover Augmentation Scheme or the Lower Itchen sources Drought Orders will not have an adverse effect on the River Itchen SAC. This conclusion recognises the uncertainties in the available ecological evidence and which, when adopting a precautionary approach, means that adverse effects on the SAC could not be ruled out.

***Valuation of the environmental impacts***

To assist with the balancing exercise, Southern Water commissioned Vivid Economics to undertake a valuation of the environmental impacts due to the proposed drought orders for the Test Surface Water, Candover Augmentation Scheme and Lower Itchen sources, producing conservative estimates as the approach assumes ecological damage will actually occur in order to obtain a valuation (rather than making use of the ecological evidence on potential damage). The valuation estimates are based on the transfer of valuations from other locations, rather than location-specific valuation estimates. Whilst the approach can only produce highly approximate estimates, the values can still help to inform the balancing of environmental harm with the public benefits of the drought order.

The valuation exercise carried out by Vivid Economics made use of stated preference willingness to pay studies of river quality that are in general use by the Environment Agency and transferring the value to the reaches of interest on the River Test and the River Itchen, assuming they undergo a one-level deterioration in ecological status. The resulting estimated impact would be a loss in environmental value of up to £11m/year.

***IROPI balancing conclusions***

Southern Water considers that avoiding the economic costs of the most severe water use restrictions, namely the rationing of water supplies through use of standpipes and/or rota cuts in droughts less severe than a 1 in 500 year drought, justifies the need for the Candover Augmentation Scheme and Lower Itchen sources Drought Orders in severe drought conditions for an interim period pending the development of a long-term water resources solution to maintaining essential water supplies (as described in the Water Resources Management Plan (WRMP) 2019). As set out above, Vivid Economics has estimated that the costs per day of rota cuts and/or standpipe water use restrictions would be in the order of £52 million per day for households and businesses. This is weighed against the short-term, reversible effects of the Drought Order on the River Itchen SAC.

Southern Water has also agreed to implement a package of mitigation measures aimed at enhancing the environmental resilience of the Candover Stream and the River Itchen to drought conditions as part of Annex 4 of the Section 20 Agreement and reducing the magnitude of any adverse effects of implementing the Drought Orders. Annex 7 of the final Drought Plan incorporates the details of these agreed mitigation measures.

As set out in the Section 20 Agreement, the Environment Agency agrees that Southern Water has a good case that it has no alternative options to its Lower Itchen sources Drought Order to maintain public water supply until it implements its long-term water resources schemes and the Environment Agency will not argue that it is unacceptable with regard to Article 6(4) of the Habitats Directive. The Environment Agency also agrees that for the period of subsequent Drought Plans until implementation of the long-term solution, Southern Water has a good case that it has no alternative solutions to its Candover Drought Order scheme, in order to maintain public water supply and that the Candover Drought Order scheme satisfies the test in Article 6(4) of the Habitats Directive. For the avoidance of doubt, the Environment Agency is not fettering its discretion to come to a different view if circumstances material to the question of available alternative options and IROPI under Article 6(4) of the Habitats Directive change. We also provide information on IROPI in annex 3 of our drought plan.

# Compensation measures

The final component of Stage 4 of the HRA process is that appropriate compensation measures must be "secured" to compensate for any ecological damage that may arise due to the implementation of an IROPI project. The Habitats Directive requires that all necessary compensatory measures are taken to ensure the "overall coherence" of the network of European sites (the Bern Convention Emerald Network) as a whole is protected. The competent authority has a responsibility for ensuring that suitable compensation is identified, but the appropriate authority also has a role in ensuring that compensation is secured.

Compensatory measures must be decided on a case-by-case basis with the aim of offsetting the negative effects caused by the IROPI project. There must also be confidence that the compensatory measures will be sufficient to offset the harm and therefore measures for which there is no reasonable expectation of success should not be considered. Agreement on the compensation measures to be implemented must be secured before consent is given for a proposal[2] to proceed. Where possible, compensation measures should be complete before the adverse effect on the European site occurs. However, in some cases, damage to European sites may necessarily occur before the compensatory measures are fully functioning.

The Appropriate Assessment of the Candover Augmentation Scheme Drought Order concluded that risks of potential adverse effects on the following habitat feature and species could not be ruled out as a consequence of implementing the Drought Order in very low river flow conditions:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (Sub-type 1 chalk river habitat, including the chalk substrate, macrophyte and macroinvertebrate communities)
- Southern damselfly *Coenagrion mercuriale*
- White-clawed crayfish *Austropotamobius pallipes*

The Appropriate Assessment of the Lower Itchen sources Drought Order concluded that risks of potential adverse effects on the following habitat feature and species could not be ruled out as a consequence of implementing the drought order in very low river flow conditions:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (Sub-type 1 chalk river habitat, including the chalk substrate, macrophyte and macroinvertebrate communities)
- Atlantic salmon *Salmo salar* (freshwater life-cycle stages)
- Southern damselfly *Coenagrion mercurial*

Detailed discussions have taken place with Natural England and the Environment Agency to develop a compensation package for each Drought Order, which are set out in Annex 4 of the Section 20 Agreement and also included at Appendices C and D of this HRA Report. Tables 10.1 and 10.2 below provide a high level summary of the compensation measures which were agreed in 2018 following the Public Inquiry.

[2] A proposal in this context means a drought permit or order and does not mean a drought plan

**Table 10.1 Compensation measures for Candover Augmentation Scheme Drought Order**

| Feature or Species | Compensation Measure(s) |
|---|---|
| Rivers with floating vegetation often dominated by water-crowfoot | i) Carry out feasibility studies to determine the specific locations for the compensation measures to be implemented and secure landowner consent<br><br>ii) EITHER:<br><br>a) Carry out chalk stream habitat restoration measures covering 6km of chalk stream habitat (or as otherwise confirmed) on the River Dun tributary of the River Test.<br><br>OR<br>Carry out chalk stream habitat restoration measures covering 6km of chalk stream habitat (or as otherwise confirmed) on the Wallop Brook (or equivalent location) tributary of the River Test.<br><br>OR<br><br>Carry out chalk stream habitat restoration measures covering 6km of chalk stream habitat (or as otherwise confirmed) on the Bourne Rivulet tributary of the River Test.<br><br>The specific measures implemented will be determined based on the requirements of the river as well as to fully ensure the coherence of the Emerald network and will be subject to further assessment. |
| Southern damselfly | i) Carry out feasibility studies to determine the specific locations for the compensation measures to be implemented<br>ii) Secure management of land and any relevant water control structures adjacent (within 1km, but ideally within 500m) to, but not currently supporting, an existing Southern damselfly population in the River Test catchment, or to appropriate areas of floodplain wetland in the Meon.<br><br>iii) Secure the funding for any required implementation of habitat enhancement and/or creation for the Southern damselfly.<br><br>iv) Secure agreements for any planning permissions or flood risk permits or other permissions (e.g. Natural England consent).<br><br>v) Create or enhance existing habitat for Southern damselfly at the sites confirmed by earlier survey and feasibility study work, covering a total of 2.5km (or as otherwise confirmed), preferably enhancing existing habitat in the Test Valley (or by species translocation), or otherwise create new habitat in the Meon Valley (through species translocation). |
| White-clawed crayfish | i) Maintain a captive brood stock of white-clawed crayfish specimens collected from the Candover Stream working with Bristol Zoological Gardens and the Hampshire & Isle of Wight Wildlife Trust<br><br>ii) Identify and secure sites for release of white-clawed crayfish from the captive breeding programme, following implementation of any Candover Augmentation Scheme Drought Order<br><br>iii) White-clawed crayfish release, following the implementation of any Candover Augmentation Scheme Drought Order. |

**Table 10.2 Compensation measures for Lower Itchen Sources Drought Order**

| Feature or Species | Compensation Measure (s) |
|---|---|
| Rivers with floating vegetation often dominated by water-crowfoot | i) Carry out feasibility studies to determine the specific locations for the compensation measures to be implemented and secure landowner consent<br><br>ii) In the event of an application for a Lower Itchen sources Drought Order:<br><br>EITHER:<br><br>a) Carry out chalk stream habitat restoration measures for parts of the River Test covering 36 ha of chalk stream habitat (or as otherwise confirmed) between Wherwell and Kimbridge as identified in the Test and Itchen Restoration Strategy.<br><br>OR<br>Carry out chalk stream habitat restoration measures for parts of the River Meon covering 36 ha of chalk stream habitat (or as otherwise confirmed)<br><br>The specific measures implemented will be determined based on the requirements of the river as well as to fully ensure the coherence of the Emerald network and will be subject to further assessment. |
| Southern damselfly | i) Carry out surveys to confirm the extent of the habitat that may potentially be adversely affected by the Drought Order and carry out feasibility studies to determine the specific locations for the compensation measures to be implemented<br><br>ii) Secure management of land and any relevant water control structures adjacent (within 1km, but ideally within 500m) to, but not currently supporting, an existing Southern damselfly population in the River Test catchment, or to appropriate areas of floodplain wetland in the Meon.<br><br>iii) Secure 'in principle' agreements for any planning permissions or flood risk permits or other permissions (e.g. Natural England consent).<br><br>iv) SWS to provide funding for delivery of enhancements to existing habitat (or creation of new habitat) for Southern damselfly. Delivery is likely to require work at two - four sites to provide in aggregate at an appropriate spatial extent of river habitat creation or enhancement as confirmed by earlier survey and feasibility study work, preferably enhancing existing habitat in the Test Valley (or by species translocation), or otherwise create new habitat in the Meon Valley (through species translocation). |
| Atlantic salmon | i) Carry out sampling and analysis of DNA of Meon Atlantic salmon to confirm they are of the same genetic strain as Atlantic salmon in the River Itchen<br><br>ii) EITHER<br>Deliver habitat enhancement and salmon passage easement work on the lower River Meon providing that genetic survey work identifies a sufficiently genetically similar pool of Atlantic salmon<br>OR<br>Modify structures and/or water management practices at Titchfield Haven in order to improve the attractiveness of the River Meon to Atlantic salmon migrating up Southampton Water<br>OR<br>Modify easement of Atlantic salmon passage by removing a weir in the lower Dorset River Stour. If the weir cannot be removed, provide additional Atlantic salmon habitat around the weir. |

The compensation measures proposed for the Sub-type 1 chalk river habitat and the Southern damselfly for the Lower Itchen sources Drought Order will be additional to those implemented for these same designated features in respect of the Candover Augmentation Scheme Drought Order Compensation Package.

The scale and technical nature of measures constituting the compensation package expected for the Lower Itchen and Candover Drought Orders were largely agreed in draft with the Environment Agency and Natural England at the Public Inquiry in March 2018. Agreement on the nature of the

measures has been reached through further discussion with the Environment Agency and Natural England during 2018-2019, and further discussions regarding the implementation of the measures have been ongoing during 2019. As the measures involve habitat creation in the river or within the riparian area, this means they should be implemented before a drought starts developing. However, it is also recognised that the actual risk of either of the two Drought Orders being required is remote: they should only need to be implemented if a severe drought develops. It has also been agreed this is a special case of interpretation of the pertinent law and expectations; there is no precedent. Balancing all these issues, Southern Water has committed to a ten year implementation schedule of the compensation measures package for both the Drought Orders, with periodic reviews of progress and future risks. The Environment Agency and Natural England have agreed this approach. At the time of finalising this Drought Plan, the final wording of the IROPI Compensation Package documents was being refined for final agreement and sign-off. The implementation phase will then commence. The final draft of the compensation packages as at July 2019 are provided at Appendix C and D of this HRA Report.

A monitoring programme for each of these two Drought Orders has also been agreed with Natural England and the Environment Agency and also incorporated into Annex 4 of the Section 20 Agreement (and incorporated into Annex 7 of the final Drought Plan). The monitoring will contribute to confirming the precise spatial scale and extent of the required compensation measures as well as confirming the suitability of relevant measures at the proposed implementation locations. Monitoring will also inform assessment of the implementation and post-implementation success of the compensation measures.

The decision on IROPI is for the Secretary of State. Subject to that, it is agreed between Natural England, the Environment Agency and Southern Water that, in committing to delivering the timetable of works set out in the compensation packages, Southern Water has put in place compensation that is capable of ensuring the continuity of the ecological processes essential for maintaining the overall coherence of the Emerald network, sufficient so that compensation for the Lower Itchen sources Drought Order and Candover Augmentation Scheme Drought Order elements of the Drought Plan can be considered to be in compliance with the Habitats Directive for the purpose of the Drought Plan.

# Appendix B

## Options considered but rejected due to implementation timescales

### *Permanent desalination plant to meet deficit in severe drought*

The planning, design and development timescales required for a permanent desalination plant to supply the Hampshire Southampton East Water Resource Zone (either directly or indirectly via another Water Resource Zone or bulk supply) are beyond the lifetime of this Drought Plan. Southern Water has explored a range of permanent desalination plant options to supply the Southampton East zone as part of the development of its Water Resources Management Plan 2019; these investigations have indicated that feasible options do exist in south Hampshire, but the planning, design, legal permissions, construction and commissioning timescales for the desalination treatment plant and associated development of treated water transfer facilities to Southampton East would preclude the availability of this alternative supply of water until 2027 at the earliest (Fawley desalination scheme[3]).

Further details are set out in the Water Resources Management Plan 2019.

### *Additional bulk water imports from neighbouring water companies (beyond the 15 Ml/d bulk import from Portsmouth Water included in the Drought Plan 2022)*

Discussions have been held with Portsmouth Water as part of the development of the Water Resources Management Plan 2019 to understand the potential future availability and timescales for increasing bulk supplies from Portsmouth Water to the Southampton East Water Resource Zone. These discussions indicate that (subject to commercial agreement and further detailed investigations) additional bulk supplies could be made available by Portsmouth Water. Two stages of development have been identified: the first stage would require enhancement work by Portsmouth Water within its existing water source and supply system; the second stage would require the development of a major new raw water reservoir source in the Havant area. The timescales for the first stage of enhancement works would preclude availability of additional supplies during the lifetime of this Drought Plan.

Discussions with other neighbouring companies, including through the Water Resources South East group, indicate that no additional bulk supplies could be made available during the lifetime of this Drought Plan.

Further details are set out in the Water Resources Management Plan 2019.

### *Additional abstraction from River Test and pipeline to Lower Itchen Water Supply Works*

This scheme was included in Southern Water's 2014 Water Resource Management Plan. However, due to the proposed changes by the Environment Agency to the company's abstraction for the Test Surface Water source, development of this scheme has not taken place. The scheme is no longer viable with the proposed abstraction licence changes and has been excluded from the Water Resources Management Plan 2019.

The timescales for construction of a new pipeline and seeking a further, more extensive drought order for the Test Surface Water source to temporarily vary the proposed abstraction licence

[3] The Fawley desalination scheme is no longer going ahead.

conditions to allow more abstraction for transfer to the Hampshire Southampton East Water Resource Zone are such that this could not be achieved during the lifetime of this Drought Plan. It is also very uncertain whether the Environment Agency would support a further drought order to allow additional abstraction beyond that included in the Test Surface Water drought order.

### *Engineering works to develop new freshwater sources beyond the Itchen catchment*

Southern Water has explored a wide range of potential alternative freshwater sources beyond the River Itchen catchment (where no additional freshwater sources are available) to supply the south Hampshire area as part of the development of its draft Water Resources Management Plan 2019. These investigations have indicated a number of potential options may be feasible (including new bulk water imports and intra-zonal transfers), but the timescales for planning, design, legal permissions, construction and commissioning timescales for the desalination treatment plant[4] and associated development of treated water transfer facilities to the Hampshire Southampton East Water Resource Zone would preclude the availability of this alternative supply of water during the lifetime of this Drought Plan.

Further details are set out in the Water Resources Management Plan 2019.

### *Indirect water reuse schemes*

Southern Water has investigated several indirect water reuse options to supply south Hampshire as part of the development of its Water Resources Management Plan 2019, including options in the Southampton East Water Resources Zone. These options are technically feasible but there may be regulatory and/or planning challenges to overcome in order for them to be developed and implemented, including issues around the discharge of highly treated wastewater effluent to SAC and SSSI designated rivers in light of potential regulatory drivers to fulfil the Common Standards Monitoring Guidance for SAC and SSSI designated rivers. Due to these issues, further investigations will be required and the timescales for planning, design, legal permissions, construction and commissioning timescales for the treatment plant and associated development of treated water transfer facilities to the Southampton East WRZ would preclude the availability of this alternative supply of water during the lifetime of this Drought Plan.

Further details are set out in the Water Resources Management Plan 2019.

## Options considered but rejected as infeasible

### *Reduce supplies to the Isle of Wight from the mainland to enable increased support from the Hampshire Southampton West WRZ to Hampshire Southampton East WRZ*

In severe drought, water sources on the Isle of Wight will already be depleted and drought orders are likely to be required to help maintain essential water supplies to customers on the island, alongside water use restrictions. In such circumstances, supplies to the island via the Cross Solent Main from the Hampshire Southampton West Water Resource Zone are highly likely required to be sustained at an elevated level and therefore reducing this support to the Isle of Wight to instead provide additional supplies to Southampton East Water Resource Zone is considered infeasible.

### *Construction of new satellite boreholes at existing licensed boreholes*

Whilst it would be feasible to construct new satellite boreholes at existing licensed groundwater source sites, in drought conditions this measure is highly unlikely to yield additional volumes of water beyond the deployable output of the existing boreholes in severe drought conditions, but rather

[4] The Fawley desalination scheme is no longer going ahead.

redistribute abstraction volumes over a slightly wider area of the underlying aquifer. Consequently, this option is considered infeasible in addressing the supply shortfall in the Southampton East Water Resource Zone.

### *Temporary desalination plant to supply Southampton East WRZ*

Whilst it might be feasible to identify a site and procure a "package" desalination plant along Southampton Water or the Itchen or Test estuaries in the timeframes necessary in severe drought, the practicalities of laying a large temporary water transfer main to take the treated water from the desalination plant location to the nearest strategic service reservoir within the Southampton East Water Resource Zone is considered infeasible in the timeframe required. This principally due to the fact that the temporary treated water transfer main would need to be laid through a densely populated and urban/industrial environment from the estuarine location up through the City of Southampton to the service reservoir, along with temporary pumping facilities. Works to blend the treated desalination water supply with the normal water supply would also need to be provided. This would be an extremely challenging engineering project and it is unlikely that this would be feasible to implement in the timeframes required.

### *Water tankering*

The predicted severe drought supply deficit of 33Ml/d cannot reasonably or feasibly be met by water tankering. Evidence from other water companies and national water tanker service providers[5] has shown that a modern road water tanker can carry up to **30,000 litres**. This means there would need to be at least **1100 tanker journeys** and deliveries from water sources located outside of the River Itchen catchment to the strategically-located treated water service reservoir in Southampton each day to deliver 33Ml/d.

A practical, feasible upper limit to the volume of water tankering to the treated service reservoir is considered to be around 5 tankers an hour working a 24/7 shift: this would provide 125 tanker deliveries a day around the clock, providing a maximum volume of **3.5Ml/d**. This assessment takes account of the time taken to discharge each tanker into the service reservoir (approx. 30 minutes at the maximum rate of ~1,000 l/minute to discharge a full tanker) and how many tankers could feasibly discharge into the service reservoir at once (5 tankers discharging simultaneously is considered a safe maximum upper limit).

### *Direct water reuse*

Drinking Water Regulations currently prohibit the direct reuse of treated effluent from wastewater treatment works for potable water supplies. Additionally, there are no concentrated large industrial or commercial customers within the Southampton East WRZ which could potentially be supplied directly with treated effluent for non-potable purposes through a dedicated pipeline from one of Southern Water's wastewater treatment works.

[5] e.g. evidence obtained from United Utilities Water Ltd and Tardis Environmental Services (tanker logistics company)