Revised Draft Water Resources Management Plan 2024

Appendix 1C – Southern Water and Portsmouth Water Common Understanding

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Forward Note:

This document has been jointly produced between Portsmouth and Southern Water to ensure a common understanding of the imports and exports between our companies in the baseline and final plan as part of the rdWRMP24.

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1. Introduction

1.1 This Annex

The Southern Water and Portsmouth Water Revised Draft Water Resource Management Plans 2024 (rdWRMP24s) set out several bulk supply transfers (imports and exports) that represent key links between the Water Resource Zones (WRZs) of the two companies.

This Annex provides a common understanding of these bulk supplies and describes how they are expected to be utilised over the duration of the plans, from 2025 to 2075. It also presents the results of sensitivity testing to help identify Water Framework Directive (WFD) related 'no deterioration' risks to water bodies.

This Annex has been developed jointly between Southern Water and Portsmouth Water to address representations by regulators and stakeholders on the draft WRMP24s, which were published for consultation in November 2022. Further information on these representations is provided in Section 1.2.

The timing of investments and utilisation data presented in this Annex, including that from sensitivity testing, represents the output of investment modelling by the Water Resources South East (WRSE) group. The model has been used to identify the Best Value Plan (BVP) for the WRSE region, which cascades down into the rdWRMP24s of the companies in the WRSE group (Southern Water, Portsmouth Water, Thames Water, Affinity Water, SES Water and South East Water).

Section 2 of this Annex presents information about both water company supply areas and summarises the links between Portsmouth Water and Southern Water as reflected by the draft regional plan and the individual rdWRMP24s. Section 3 presents a summary of the existing imports and exports as well as the Havant Thicket reservoir approved scheme and associated bulk supply. Section 4 presents changes to our baseline imports and exports as set out in our draft Water Resource Management Plans 2024. In section 5 we consider sensitivity testing of the exports linked to the Water Framework Directive (WFD) and in section 6 we describe the next steps provide a forward look.

1.2 Representations on the draft WRMP24s

1.2.1 Proposed bulk supply from Southern Water to Portsmouth Water in 2040-41

In their representation to Southern Water's dWRMP consultation, the Environment Agency asked Southern Water to provide the following, in regard to the bulk export to Portsmouth Water in 2040-41:

- clarity on the bulk supply from Southern Water and Itchen catchment to Portsmouth Water and the year.
- more explanation on bidirectional pipeline and its implication on the Itchen catchment

Portsmouth Water have requested to include an option to export water from Otterbourne WSW to Portsmouth Water. The volume from this transfer will ultimately be supported by (I) a large new import from Thames Water to Southern Water and (ii) the Hampshire Water Transfer and Water

Recycling Project (HWTWRP). The exported water to Portsmouth Water does not come from the River Itchen.

Further information on the modelled utilisation of this bulk supply is provided in Section 4 of this Annex.

1.2.2 Planned Source J related bulk supply from Portsmouth Water to Southern Water in 2024-25

The Environment Agency also asked Southern Water to update the Source J related bulk supply in line with Portsmouth Water's latest assumptions and if including this bulk supply it should have a Contingency Plan or alternative. As well as reassurance that the schemes relying on output from Havant Thicket Reservoir can reliably achieve the required output in drought events at the same time.

Southern Water have now been informed by Portsmouth Water that they can no longer provide the additional 9 Ml/d in the Western area. This option has been removed from the constrained options list for the revised dWRMP24.

1.2.3 Existing Portsmouth Water to Southern Water's SNZ water resource zone

The Environment Agency also made comments on the Portsmouth Water bulk supply to Southern Water's Sussex North zone (SNZ). The Environment Agency wanted Southern Water to:

- communicate clearly with Portsmouth Water around the potential risk of this bulk supply transfer, timeline for delivery and any agreement between the two water companies.
- to consider a Contingency Plan and a potential alternative option to address the risk.

Southern Water have spoken to Portsmouth Water about the 'best endeavours' up to 15 Ml/d supply to Pulborough (SNZ zone) and have agreed that it can be included in its plan for up to 15 Ml/d supply in a drought on a continued 'best endeavours' basis.

Southern Water's Drought Plan contains a toolbox of interventions which could be implemented if the situation arose whereby the full 15 Ml/d bulk supply was not available. In addition, it has developed a Contingency Plan to accompany the revised dWRMP24 which includes some actions which could be implemented quickly if the need arose.

The other key mitigation is early and continuous dialogue with Portsmouth Water so that Southern Water has advanced warning if the full 15 Ml/d volume cannot be delivered so that it can start taking mitigation actions.

With respect to normal year / typical year conditions (i.e. non-drought), Portsmouth Water requested sensitivity testing for a lower 2.5 Ml/d cap on the normal year / typical year supply rate to improve the understanding of risks to Chalk water bodies under the Water Framework Directive (WFD). The results of sensitivity testing to cap normal year transfer rates are presented in Section 5 of this Annex.

Southern Water will continue to work with Portsmouth Water and use a joint Pywr water resources model to validate the WRSE Best Value Plan solutions at a network/ hydrological scale.

1.2.4 Transfer utilisation information

In its representation to Portsmouth Water's dWRMP24 consultation, the Environment Agency asked for utilisation information on transfers. This is now provided by the current Annex.

2. Water company background and summary of interactions between company supply areas

2.1 Southern Water supply area

Southern Water provides water services to nearly 2.6 million customers and wastewater services to nearly 4.6 million customers across an area of 4,450 square kilometres, extending from Kent in the east, through parts of Sussex, to Hampshire and the Isle of Wight in the west (Figure 1). This includes providing wastewater services in areas where water is supplied by other water companies.

Water supplies are largely reliant on groundwater from the widespread chalk aquifer that sits under much of the region. Groundwater makes up around 70% of our total water supply. Groundwater is also important in maintaining flows to the River Test and River Itchen in Hampshire.

River abstractions account for 23% of our water supplies. Four surface water impounding reservoirs provide the remaining 7% of our water supplies: Bewl Water, Darwell, Powdermill and Weir Wood. The total storage capacity of these four reservoirs is 42,390 million litres (Ml). South East Water is entitled to 25% of the yield from the River Medway Scheme, which incorporates the storage within Bewl Water Reservoir.

In addition to South East Water, we share borders with Affinity Water, Portsmouth Water, SES Water, South West Water, Thames Water and Wessex Water. Water is shared between us and a number of these companies through existing pipelines.

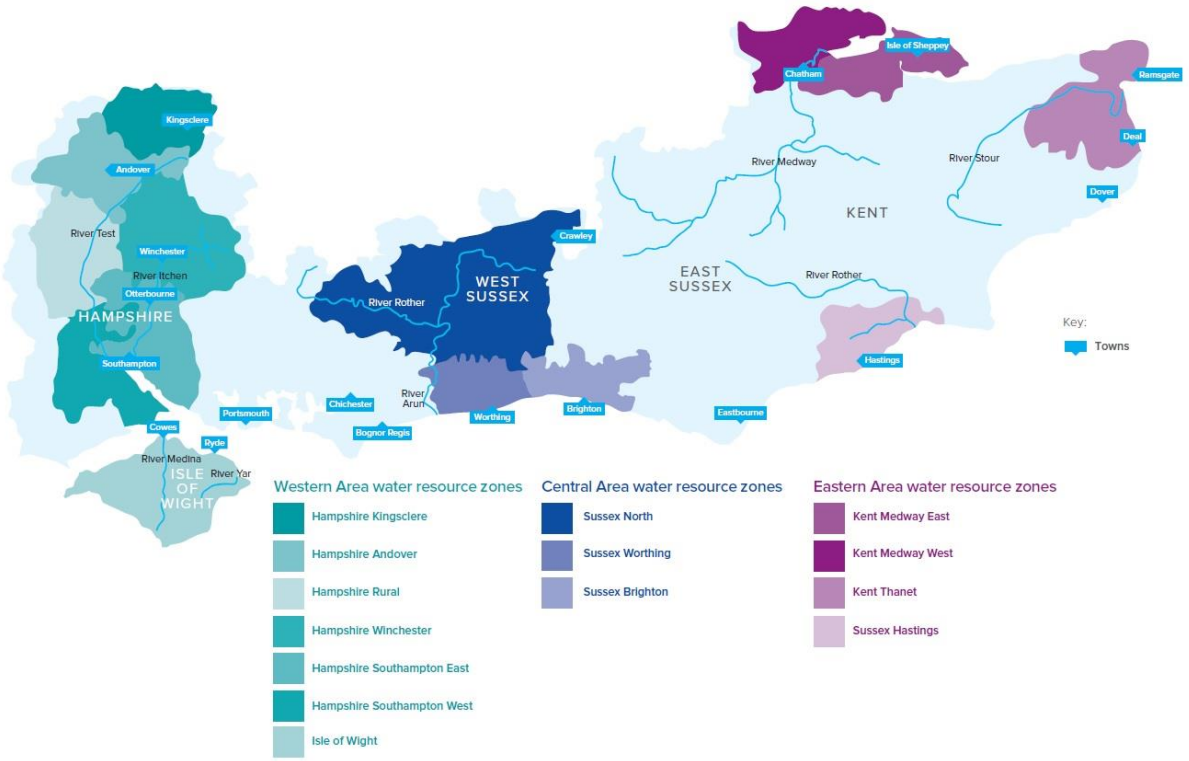

Figure 1 The Southern Water supply area

2.2 Portsmouth Water supply area

Portsmouth Water is proud of its long tradition of serving Portsmouth and the wider surrounding area with high quality drinking water since it was established in 1857. Through amalgamation, the supply area has expanded beyond Portsmouth to supply the towns of Gosport, Fareham, Havant, Chichester and Bognor Regis, in the counties of Hampshire and West Sussex (see Figure 2).

On average, Portsmouth Water distributes around 175 million litres of water each day to over 740,000 customers in around 320,000 properties. It also provides water to neighbouring water companies in the Southeast. Portsmouth Water is a “water only” company. That means it only supplies drinking water to customers. Southern Water provides the wastewater service to Portsmouth Water customers.

Figure 2 The Portsmouth Water supply area

2.3 Summary of interactions between Southern Water and Portsmouth Water supply areas

Southern Water and Portsmouth Water have taken the high level Water Resources South East (WRSE) Pywr model for the Western area and Portsmouth Water supply areas to develop a more granular Pywr model, reflecting more detail in the network and known river and groundwater constraints. The aim of this exercise was to understand how the Havant Thicket Reservoir provides conjunctive-use benefit with the HWTWRP, at key time intervals (2030, 2040 and 2050) in the network development. As a result of this further work since the publication of dWRMP24, the size variants of the water recycling plant at Budds Farm WTW have been revised to 20Ml/d, 40Ml/d and 60Ml/d. Consequently, the initial minimum water recycling plant size has been uplifted from 15Ml/d to 20Ml/d.

The results of the Pywr modelling have been used to inform the WRSE investment model, which in turn was used to inform the revised draft regional plan and Southern Water’s and Portsmouth Water’s rdWRMP24. The use of coherent datasets and assumptions by companies means that transfers between companies can be more appropriately considered.

A summary of key interactions between Southern Water and Portsmouth Water supply areas, as represented within the draft regional plan and rdWRMP24s, is provided in Figure 3. The interactions develop over time to include Havant Thicket Reservoir and the HWTWRP. Further information on these interactions is provided within later sections of this Annex.

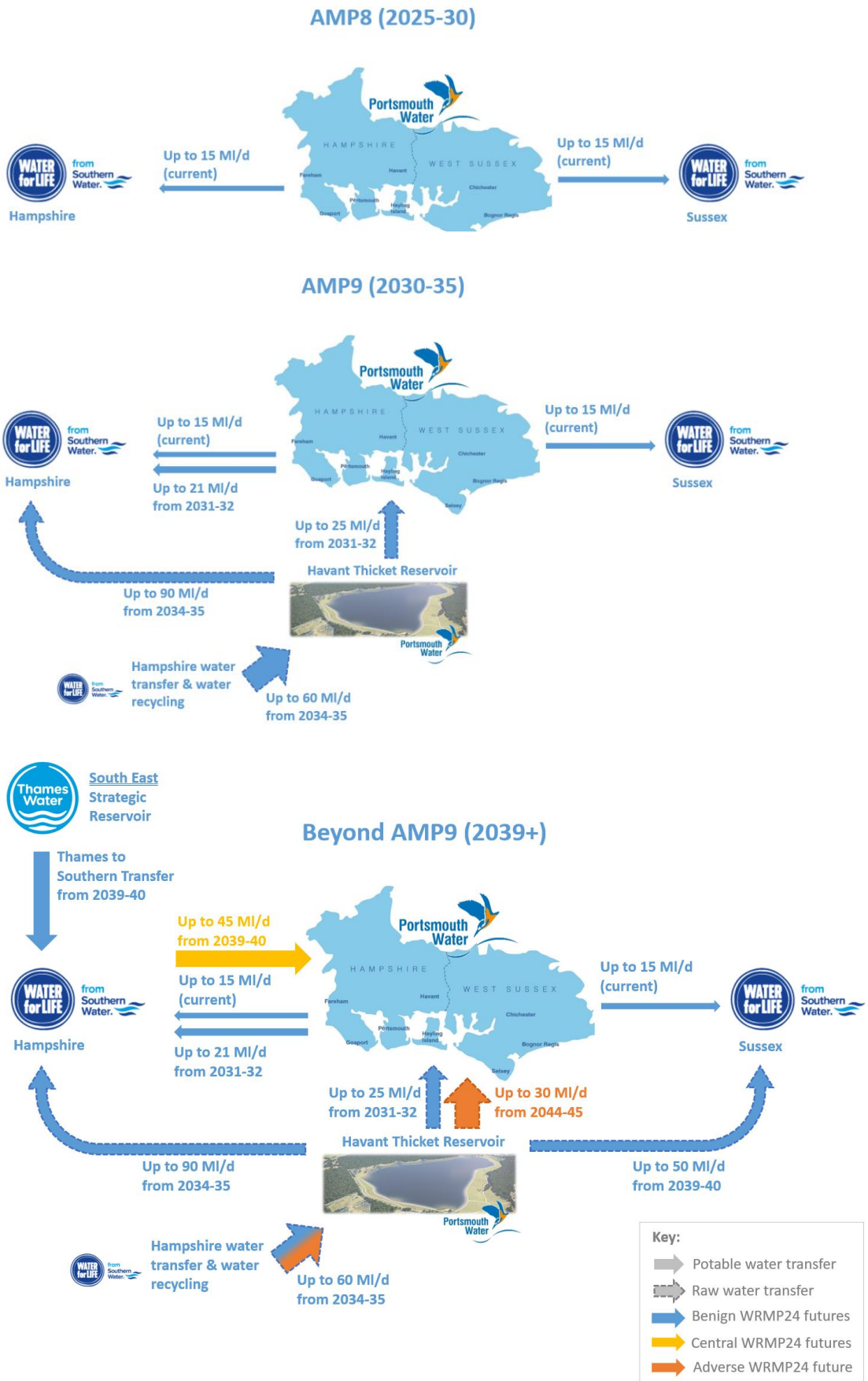

Figure 3 Summary of interactions between Southern Water and Portsmouth Water supply areas

3. Baseline imports and exports

3.1 Summary of existing imports and exports

Southern Water has several bulk transfer agreements with its neighbouring water companies, including Portsmouth Water ('PRT') (see Table 1, with the PRT transfers highlighted). It also transfers water across its WRZs (Table 2). In addition, it also provides non-potable supplies to two large industrial users; one in the HSW WRZ and the other in the SHZ WRZ.

For the Southern Water and Portsmouth Water WRMP24s we have assumed that all existing transfers will continue until the expiry year of their contracts unless there is a specific option to modify any of them.

Bulk transfer agreements with neighbouring water companies are included as options in the Water Resources South East (WRSE) options appraisal investment modelling upon the expiry of their current contractual term.

Table 1: Southern Water's existing bulk transfers with neighbouring water companies

Type	Donor WRZ	Recipient WRZ	Potable or raw	Maximum volume (Ml/d)	Contract expiry
Export to AFW (Deal)	KTZ	RZ7	Potable	1.24	
Export to SEW (Belmont)	KME	RZ6	Potable	7.8	
Export to SEW (Bewl)	KMW	RZ7	Potable	12.3	
Export to SEW (Burham)	KMW	RZ7	Raw		
Export to SEW (Darwell)	SHZ	RZ3	Raw	8/17th of the Bewl/Darwell Yield	
Export to SEW (Matts Hill)	KME	RZ6	Potable	7.5	
Export to SEW (Pitfield)	KMW	RZ6	Potable	0.5	
Export to SEW (Weir Wood)	SNZ	RZ5	Potable	5.4	2031
Export to WSX (Ibthorpe)	HAZ		Potable	0.41	
Import from AFW (Napchester)	RZ7	KTZ	Potable	0.1	
Import from SES (North Sussex)	SES	SNZ	Potable	0.8	2025-26
Import from PRT (Eastleigh)	**PWS PRT**	**HSE**	**Potable**	**15.0**	**2028-29**
Import from PRT	**PWS PRT**	**SNZ**	**Potable**	**15.0**	**2026**
SEW bulk supply near Canterbury	SEW	KTZ	Potable	2	tbc*

*This transfer is in development for 2025 as part of our preferred WRMP19 delivery

Table 2: Southern Water's existing interzonal transfers

Donor WRZ	Recipient WRZ	Link	Potable or Raw	Maximum volume (Ml/d)
HRZ	HSE	Abbotswood	Potable	5.1
HSE	IOW	Cross-Solent main	Potable	20.0
HSE	HWZ	Olivers Battery	Potable	9.6
HSW	HSE	Woodside	Potable	16.8
HSW	HSE	Gover Road	Potable	2.7
HSW	HSE	Rownhams	Potable	5.6
HSW	HRZ	Broadlands	Potable	3.1
SNZ	SWZ	Rock Road	Potable	11.8
SWZ	SNZ	Tenants Hill	Potable	13.1
SWZ	SBZ	V6	Potable	16.8

Donor WRZ	Recipient WRZ	Link	Potable or Raw	Maximum volume (Ml/d)
KME	KTZ	Selling transfer	Potable	12.0
KMW	KME	Nashenden	Potable	37.1

Further information on the existing Portsmouth Water and Southern Water transfers is provided in the sections below.

3.2 Existing Portsmouth Water export to SWS SNZ

Portsmouth Water has an existing bulk supply agreement with Southern Water to supply their Sussex North (SNZ) WRZ. The infrastructure necessary for this bulk supply was constructed in 2004.

The maximum transfer rate is 15 Ml/d and only allows water to flow from Portsmouth Water to Southern water. There is a cross connection between the bulk supply to Sussex North and an existing Southern Water main to its Sussex Worthing (SWZ) WRZ. This connection provides operational flexibility for Southern Water but does not increase the total transfer capacity.

Within the WRSE investment model the existing 15 Ml/d bulk supply to Sussex North is treated as part of the baseline until 2025–26, beyond which point it becomes an option that can be selected if required. The utilisation of the modelled transfer across different adaptive planning 'situations' (possible futures) is shown in Figure 4, where 'Situation 4' is the reported pathway for Southern Water and Portsmouth Water's rdWRMP24s.

The utilisation is also shown for different drought severities, from a normal / typical year scenario, through to a hybrid 1 in 200 year to 1 in 500 year scenario; for the latter hybrid condition, a 'critical period' utilisation plot is also provided, which reflects utilisation rates under a peak summer demand scenario.

Under all the modelled possible futures and drought scenarios the model uses the full 15 Ml/d transfer during the first year of the rdWRMP24 planning period, meeting the maximum contractual transfer rate.

Once the transfer becomes optional, in a normal year / typical year scenario the utilisation drops to zero until 2030-31 indicating that Southern Water does not need the water. However in the drought scenarios the transfer is utilised at the full 15 Ml/d rate during the period 2025-26 to at least 2031-32.

Beyond 2031-32 the modelled transfer is variable, depending on the adaptive planning situation i.e. depending on how challenging the future supply demand balance is owing to differing levels of environmental protection, climate change and population growth.

In the situation 4 rdWRMP24 reported pathway the annual average export eventually lowers to zero, which indicates that due to higher levels of environmental protection, population growth and climate change, Portsmouth Water no longer has the resources to supply Southern Water through this connection. However, the potential to provide a brief export to Southern Water in a critical period such as peak summer demand, would be retained.

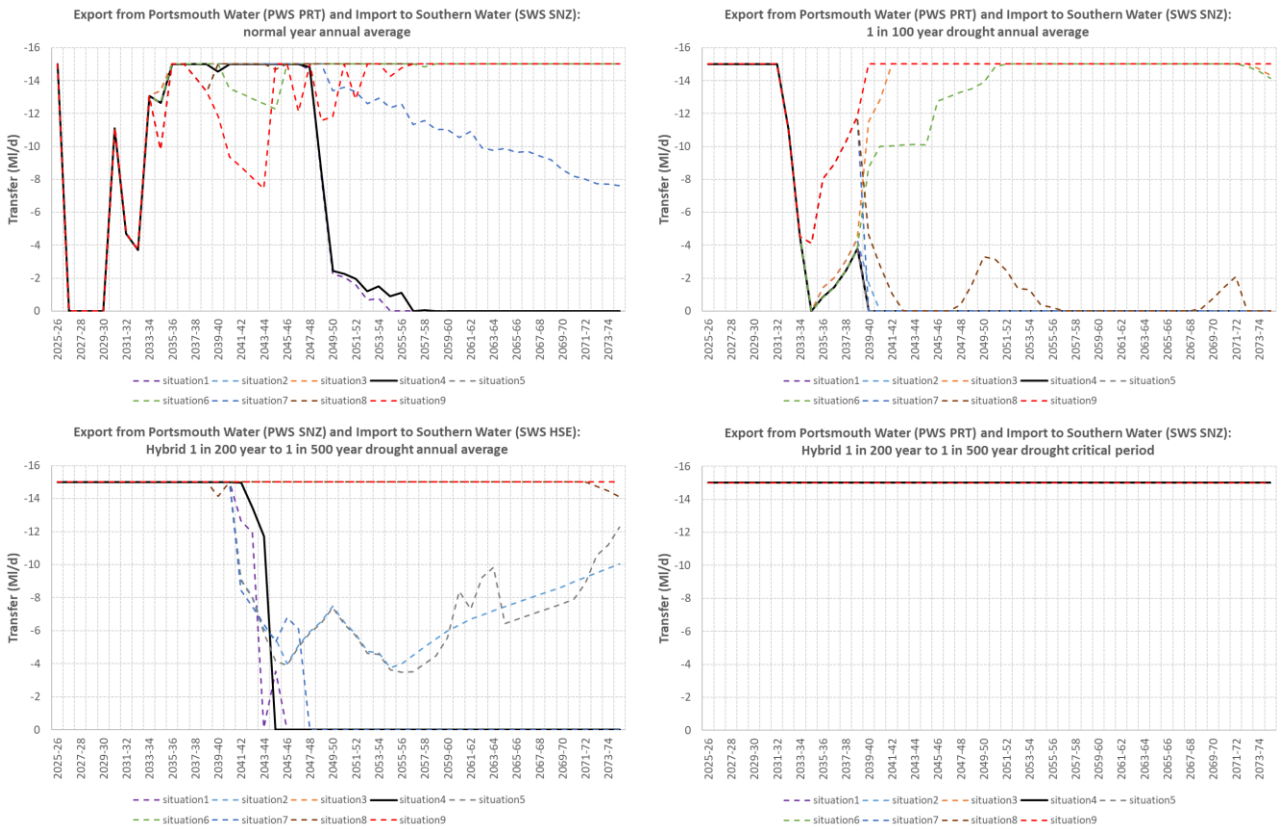

Figure 4 Modelled utilisation of the 15 Ml/d capacity export from Portsmouth Water to Southern Water's SNZ WRZ

3.3 Existing Portsmouth Water export to SWS HSE

Portsmouth Water has an existing bulk supply agreement with Southern Water to supply its Hampshire Southampton East (HSE) zone. The bulk supply exports up to 15 Ml/d from Portsmouth Water to Southern Water's HSE WRZ. Flow is abstracted from the River Itchen at Portsmouth Water Source A, treated at a Portsmouth Water treatment works and then transferred to Southern Water.

Portsmouth Water's dWRMP24, published in November 2022, stated that following the planned completion of Portsmouth Water's Source J enhancement in 2024–25 the bulk supply capacity was expected to increase by 9 Ml/d. However, as clearly articulated previously in WRMP19, Portsmouth Water's ability to provide this additional bulk supply was dependent upon the success of borehole investigations at Source J and Portsmouth Water's subsequent ability to license the assets required.

Since the dWRMP24, and following the conclusion of groundwater investigations, it has been confirmed that Portsmouth Water will not be able to provide the additional 9 Ml/d bulk supply to Southern Water. Therefore, the option to increase the bulk capacity was removed from the WRSE investment model when updating our plans.

Within the WRSE investment model the 15 Ml/d bulk supply to Southern Water's HSE WRZ is treated as part of the baseline until 2028–29, beyond which point it becomes an option that can be

selected. The utilisation of the modelled transfer across different adaptive planning 'situations' (possible futures) and drought severity scenarios is shown in Figure 5, where 'Situation 4' is the reported pathway for Southern Water and Portsmouth Water's rdWRMP24s.

Under all the modelled possible futures and drought scenarios the model uses the full 15 Ml/d transfer until year 2028-29 of the rdWRMP24 planning period, meeting the maximum contractual transfer rate.

Once the transfer becomes optional, in a normal year / typical year scenario the utilisation is maintained at 15 Ml/d until 2038-39, indicating that Southern Water has a need for the import. The transfer also persists in drought scenarios, although in the hybrid 1 in 200 year to 1 in 500 year drought scenario the need for water is reduced.

Beyond 2038-39 the modelled transfer is variable, depending on the adaptive planning situation i.e. depending on how challenging the future supply demand balance is owing to differing levels of environmental protection, climate change and population growth.

In the situation 4 rdWRMP24 reported pathway the annual average export lowers to zero, which indicates that due to higher levels of environmental protection, population growth and climate change, Portsmouth Water no longer has the resources to supply Southern Water through this connection. However, the potential to provide a brief export to Southern Water in a critical period such as peak summer demand, would be retained.

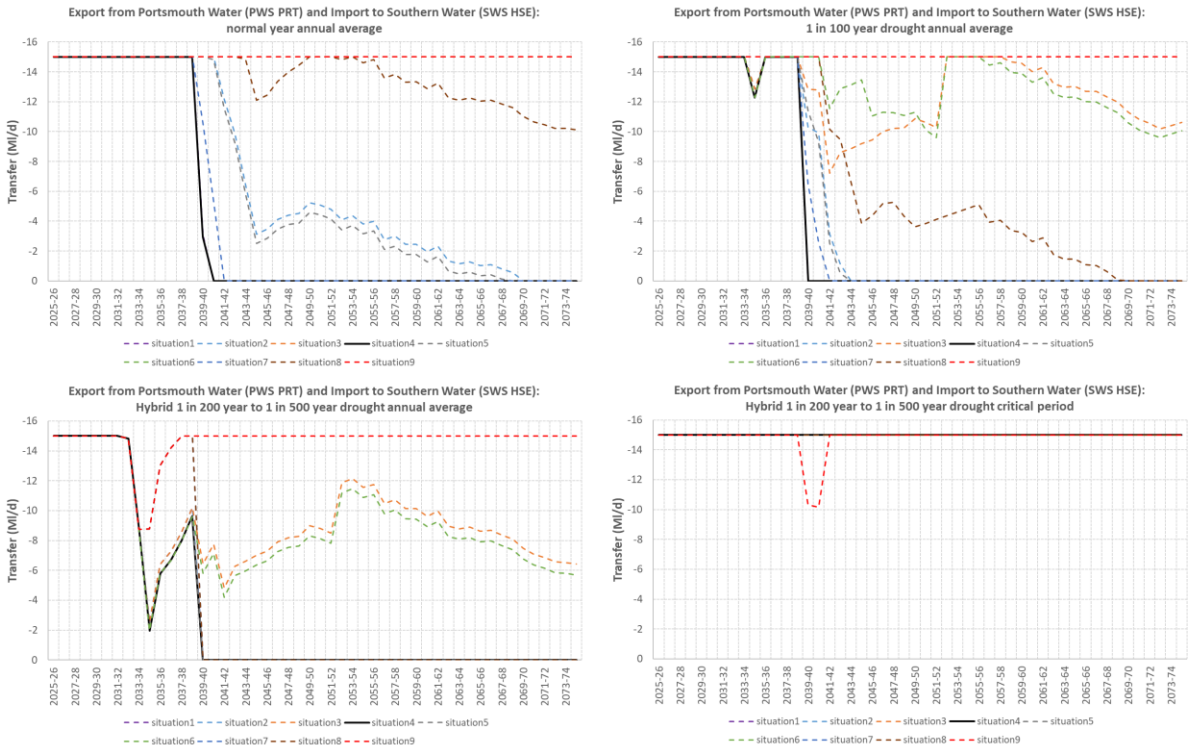

Figure 5 Modelled utilisation of the 15 Ml/d capacity export from Portsmouth Water to Southern Water's HSE WRZ

3.4 Havant Thicket Reservoir Approved Scheme and associated bulk supply

Portsmouth Water's dWRMP24 included the ongoing development of the Havant Thicket Reservoir Approved Scheme and its first use in 2029-30, to support a new 21 Ml/d treated bulk supply to Southern Water's HSE WRZ in the event of a drought.

A key change since the dWRMP24 is that the year of first possible use for the reservoir and bulk supply has been adjusted to 2031-32[1]. The WRSE investment model includes Havant Thicket reservoir within the baseline as it is an approved scheme and the associated 21 Ml/d transfer of treated water to Southern Water begins in 2031-32.

The deployable output (including conjunctive-use benefits) taken by Portsmouth Water from the Havant Thicket Reservoir across different adaptive planning 'situations' and drought scenarios is shown in Figure 6, where 'Situation 4' is the reported pathway for Southern Water and Portsmouth Water's rdWRMP24s. No water is taken from the reservoir under normal year / typical year conditions, although as planned, water is taken under drought conditions.

The utilisation of the modelled treated water transfer to Southern Water across different adaptive planning 'situations' and drought scenarios is shown in Figure 7, where 'Situation 4' is the reported pathway for Southern Water and Portsmouth Water's rdWRMP24s. Under all drought scenarios the model uses the full 21 Ml/d transfer from 2031-32 as per the contractual arrangements, which is supported by Portsmouth Water abstraction from the Havant Thicket Reservoir.

In a normal year / typical year, Portsmouth Water and Southern Water agreed that a 1 Ml/d 'sweetening' flow for the transfer would be allowed in the model; the 1 Ml/d reflects the need to keep the pipeline operational. Portsmouth Water will not take water from Havant Thicket reservoir unless there is an emergency, such as drought. Therefore, under a normal year / typical year any transfer will be supported by existing Portsmouth Water groundwater and surface water sources.

Constraining the normal year flow to 1 Ml/d is necessary so that the WRSE regional best value plan and Portsmouth Water and Southern Water's rdWRMP24 do not plan for growth in abstraction from Chalk catchments in Portsmouth Water's supply area.

1 The Havant Thicket Reservoir was originally designed to provide benefit from 2029-30 but is now forecast to provide benefit from 2031-32. The delay is the result of an opportunity to future proof the pipeline tunnel included within the approved scheme to accommodate HWTWRP if approved and is a worst-case scenario

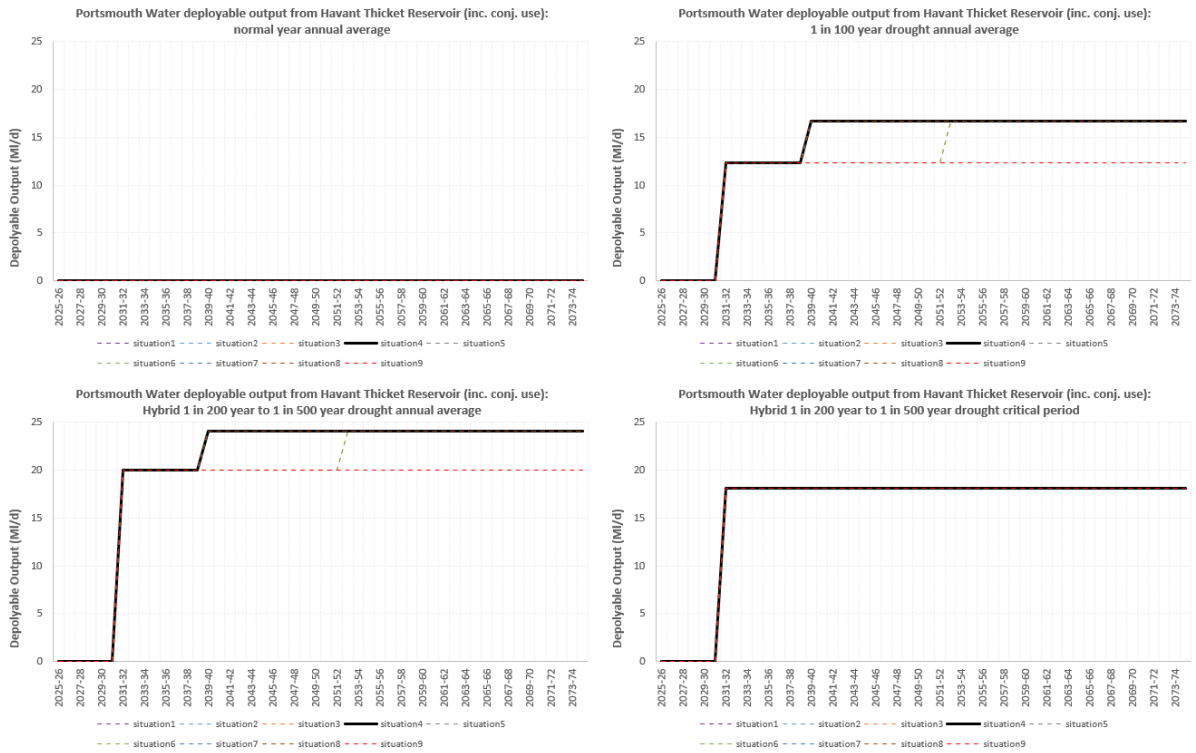

Figure 6 Portsmouth Water deployable output linked to Havant Thicket Reservoir Approved Scheme

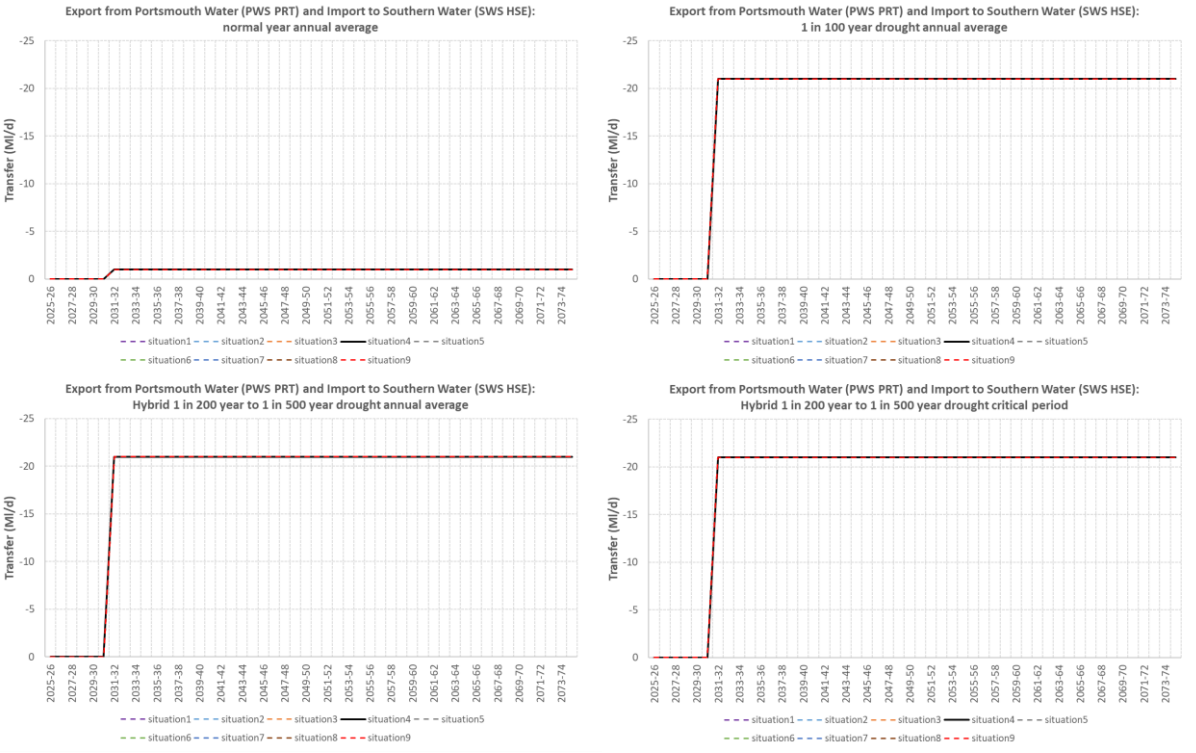

Figure 7 Modelled utilisation of the 21 Ml/d capacity export from Portsmouth Water to Southern Water's HSE WRZ, associated with the Havant Thicket Reservoir Approved Scheme

4. WRMP24 changes to the baseline

4.1 Southern Water's Hampshire Grid

In addition to Southern Water's existing interzonal transfers, Southern Water's supply forecast for the Western area has been developed assuming implementation of the 'Hampshire Grid' transfers which were selected as preferred options in WRMP19. The transfers are planned to improve connectivity between its Hampshire WRZs (HAZ, HRZ, HSE and HSW). These transfers are being developed as part of Southern Water's Water for Life Hampshire programme. Their assumed benefits are summarised in Table 3.

As discussed in Southern Water's WRZ integrity assessment these new transfers are expected to improve the connectivity across its Hampshire supply area and reduce drought risks. Southern Water will revisit its WRZ arrangement in Hampshire in future WRMPs to reflect the benefits of these transfers.

These transfer options would increase the interconnectivity and move towards a single, larger zone underpinned by a water grid.

Table 3: Hampshire grid transfer options currently being developed.

Donor WRZ	Recipient WRZ	Link	Potable or Raw	Maximum volume (Ml/d)
HSE	HWZ	Hampshire grid (reversible link HSE-HWZ)	Potable	78.0
HWZ	HSE	Hampshire grid (reversible link HWZ-HSE)	Potable	78.0
HSE	HAZ	Hampshire grid link (HSE-HAZ)	Potable	15.0
HSW	HSE	Southampton link main (reversible link HSW-HSE)	Potable	30.0
HSE	HSW	Southampton link main (reversible link HSE-HSW)	Potable	30.0
HSW	HRZ	Romsey Town and Broadlands valve (HSW-HRZ reversible)	Potable	10.0
HRZ	HSW	Romsey Town and Broadlands valve (HRZ-HSW reversible)	Potable	10.0

4.2 HWTWRP and the Havant Thicket Reservoir to Otterbourne WSW raw water transfer

Southern Water's dWRMP24 included the Hampshire Water Transfer and Water Recycling Project (HWTWRP) and its first use in 2030-31. This scheme includes a new raw water transfer from Havant Thicket Reservoir to Southern Water's Otterbourne WSW. A key change since the dWRMP24 is that the year of first possible use for the HWTWRP is 2034-35, following a detailed evaluation of the risks involved in delivery.

The deployable output from water recycling within the HWTWRP (excluding conjunctive use benefits) across different adaptive planning 'situations' and drought scenarios is shown in Figure 8, where 'Situation 4' is the reported pathway for Southern Water and Portsmouth Water's rdWRMP24s. In the first five years of use, the HWTWRP provides between 20 Ml/d and 30 Ml/d, noting that 20 Ml/d is the minimum 'sweetening' flow required to keep the pipeline and water treatment works operational. From 2039-40 the utilisation increases to 60 Ml/d in most years for Situation 4.

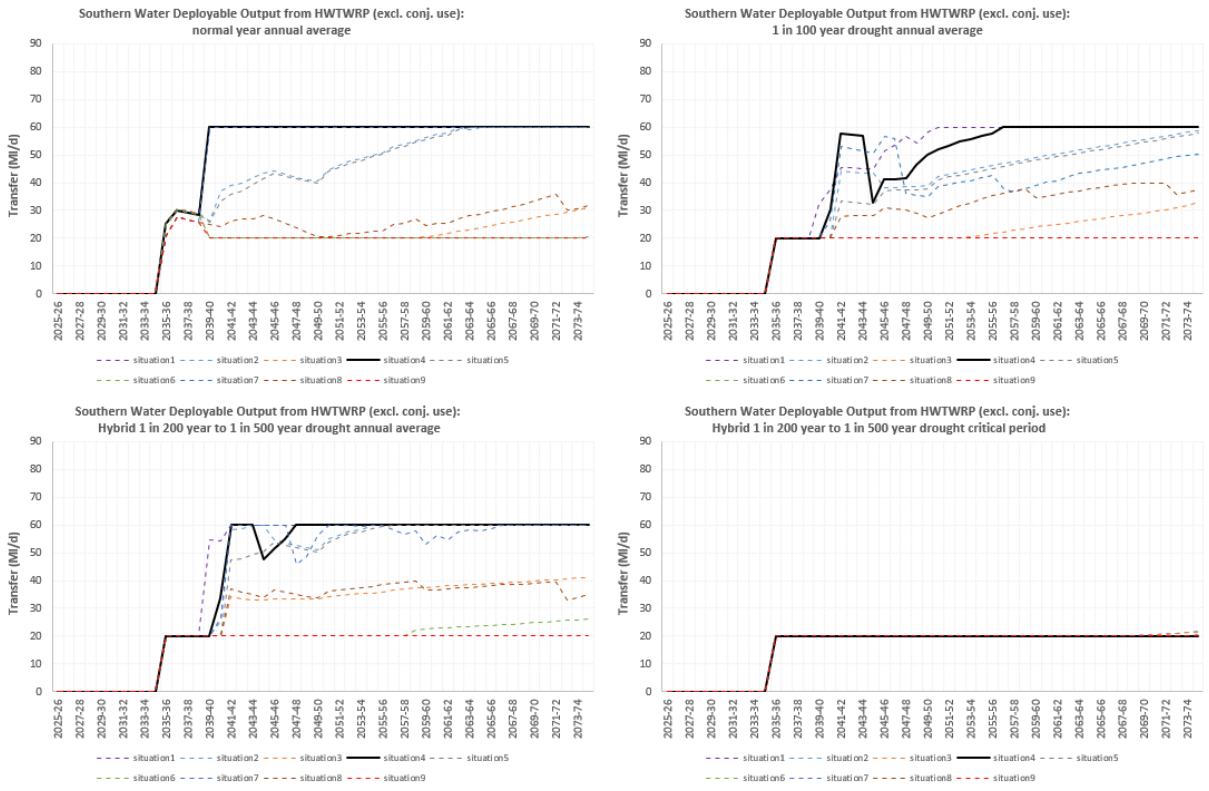

Figure 8 Southern Water deployable output linked to the HWTWRP, excluding conjunctive use benefits

The utilisation of the modelled raw water transfer to Southern Water's Otterbourne WSW across different adaptive planning 'situations' and drought scenarios is shown in Figure 9. Utilisation is greatest (up to 60 Ml/d) and more variable within the normal year / typical year scenario. This is driven by Southern Water's environmental destination and the lack of conjunctive use benefit in its Hampshire WRZs from the HWTWRP in a normal year / typical year scenario; this lack of a conjunctive use benefit was demonstrated by the joint Southern Water and Portsmouth Water Pywr model.

The HWTWRP deployable output shown in Figure 8 is greater than that transferred to Southern Water's Otterbourne WSW in the HSE WRZ shown in Figure 9. This is because some of the deployable output from the HWTWRP is transferred to Southern Water's Pulborough WSW in its SNZ WRZ and / or the Portsmouth Water supply area via Havant Thicket Reservoir, as demonstrated in later sections of this Annex.

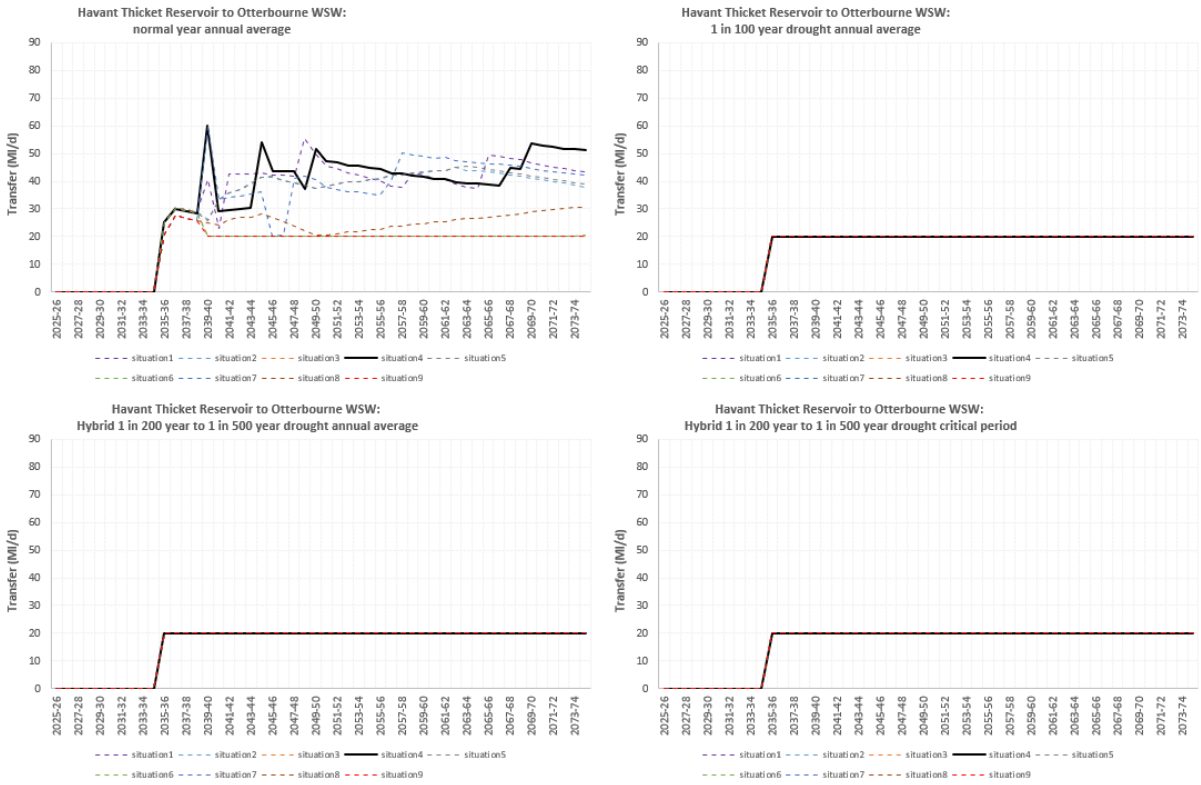

Figure 9 Modelled utilisation of the 90 Ml/d capacity transfer from Havant Thicket Reservoir to Southern Water's HSE WRZ

4.3 Havant Thicket Reservoir to Sussex North raw water transfer

Southern Water's dWRMP24 included a new transfer from Havant Thicket Reservoir to Southern Water's Pulborough WSW in its Sussex North (SNZ) WRZ, which is supported by deployable output from the HWTWRP. This transfer was selected again within the rdWRMP24.

The utilisation of the modelled raw water transfer to Southern Water's Pulborough WSW across different adaptive planning 'situations' and drought scenarios is shown in Figure 10. The transfer is utilised across most scenarios (normal year through to severe drought), although it is not needed in the summer critical period scenario.

Utilisation commences in 2039-40 and varies significantly depending on the adaptive planning situations (possible futures). The peak annual use is 40 Ml/d because the HWTWRP water recycling capacity is 60 Ml/d and 20 Ml/d is always needed in Hampshire. Under the reported pathway (Situation 4) the peak utilisation occurs in the early 2040s.

Comparison of the normal year plots in Figure 9 and Figure 10 demonstrates competition between Hampshire and Sussex supply areas for the 60 Ml/d deployable output from the HWTWRP.

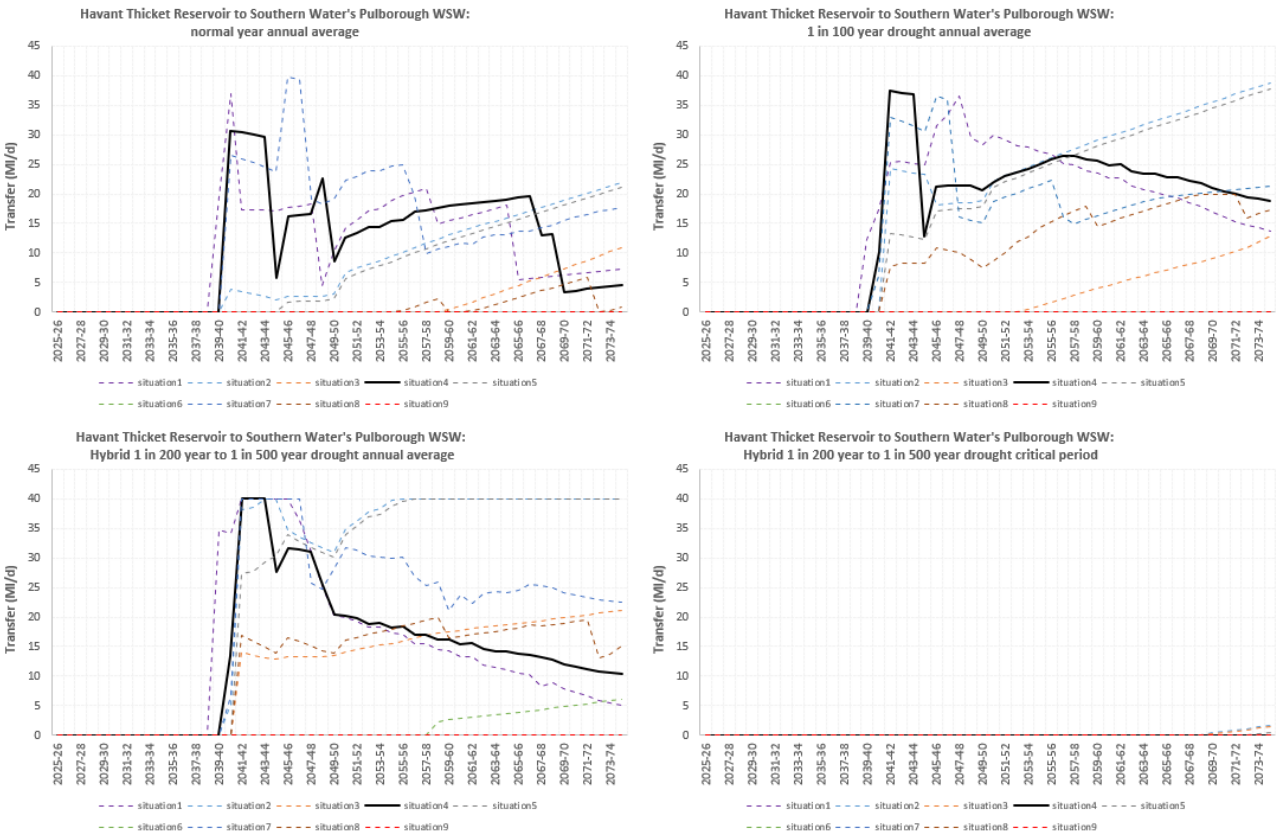

Figure 10 Modelled utilisation of the transfer from Havant Thicket Reservoir to Southern Water's SNZ WRZ

4.4 Southern Water to Portsmouth Water transfer

Portsmouth Water's dWRMP24 included a new treated import from Southern Water's HSE WRZ. The import is utilised again for the rdWRMP24 but around 10 years earlier in 2039-40.

The utilisation of the modelled treated import to Portsmouth Water across different adaptive planning 'situations' and drought scenarios is shown in Figure 11. The transfer is utilised across most scenarios (normal year through to severe drought annual average scenarios) under the reported pathway (situation 4), although it is not needed in the summer critical period scenario.

The import to Portsmouth Water from 2039-40 is enabled by the implementation of key WRSE regional schemes; these are Southern Water's HWTWRP, Thames Water's South East Strategic Reservoir Option (SESRO), and a new transfer that will bring water from SESRO into Southern Water's Hampshire WRZs (Thames to Southern Transfer).

The earliest year in which SESRO can be implemented is 2039-40, but once delivered it unlocks the new transfer to Southern Water's Hampshire area, which, alongside the HWTWRP, creates a surplus of water that can be transferred to Portsmouth Water.

It is recognised that by modelling the contractual 21 Ml/d export from Portsmouth Water to Southern Water under the Havant Thicket Reservoir Approved Scheme (Figure 7), there is a degree of re-circulation of water when considering this alongside the new import from Southern Water to Portsmouth Water (Figure 11). The need to explore the adjustment of contractual arrangements will be considered further in WRMP29.

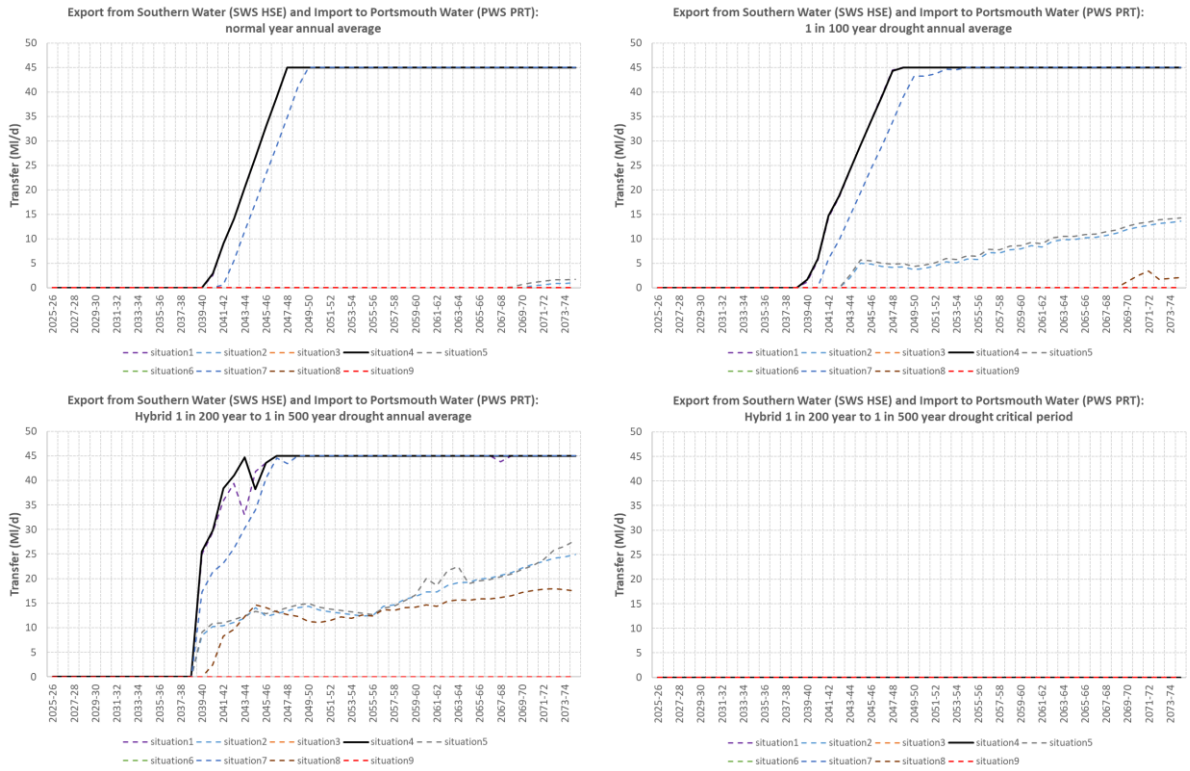

Figure 11 Modelled utilisation of the export from Southern Water's HSE WRZ to Portsmouth Water's supply area

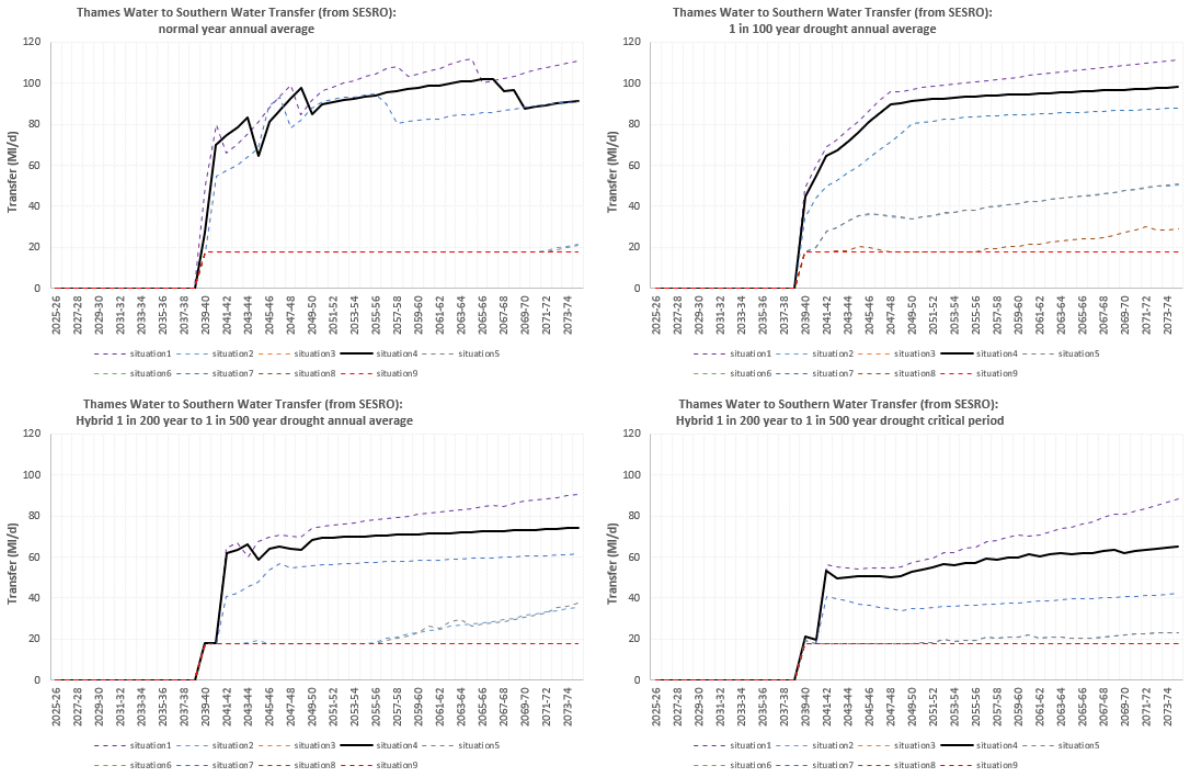

Figure 12 Modelled utilisation of the transfer of SESRO deployable output from Thames Water to Southern Water's Hampshire area

4.5 HWTWR deployable output to Portsmouth Water Works A via Havant Thicket Reservoir

Within Portsmouth Water's rdWRMP24, from 2047 onwards there is a need for further interconnectivity and treatment capacity to transfer and treat water across its supply area to utilise the water most effectively from Havant Thicket Reservoir. In the dWRMP24 these options were not selected in the reported pathway (Situation 4), but they are in the rdWRMP24 due to the need to find additional water resulting from higher sustainability reductions in Chalk catchments.

The rdWRMP24 suggests the scale of this need would require up to 20 Ml/d of additional treatment works capacity at Portsmouth Water Works A WTW from the mid to late 2040s and a new 10 Ml/d WTW at the location of service Reservoir C from the early 2050s (see Figure 13 and Figure 14). These options are predicated on the prior construction of the proposed HWTWRP scheme for Southern Water, which provides the deployable output (the source of water).

The water taken by Portsmouth Water would be blended reservoir water (i.e. with contributions from rainfall, recycled water and spring water). This water is predominantly needed in drought scenarios, and the need for water grows over time. Portsmouth Water also requires a small supply in the reported pathway (up to 5 Ml/d) during a normal year / typical year beyond the mid-2050s.

Portsmouth Water will seek to reduce the dependency on HWTWRP in the next water resources management plan (WRMP29) via the consideration of new options, although the need for recycled water in a drought is expected to remain. Portsmouth Water recognises that its regulators would prefer it to have a larger volume of water available from a wider pool of feasible options in future WRMPs, now that the magnitude and complexity of the water resources challenge is better understood. The company also appreciates that some of its customers would prefer it to minimise the reliance upon the HWTWRP, particularly during a normal year / typical year scenario.

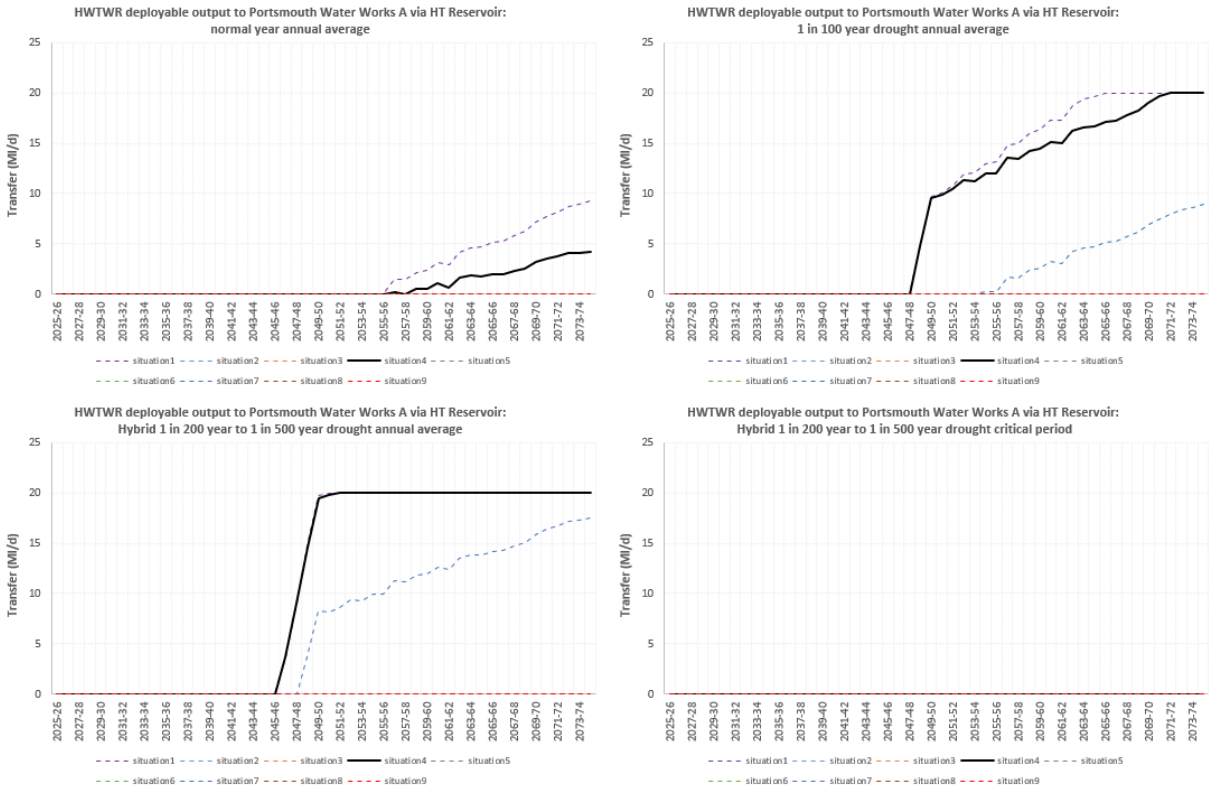

Figure 13 Modelled utilisation of the transfer of raw water from HWTWR to Portsmouth Water Treatment Works A via Havant Thicket Reservoir

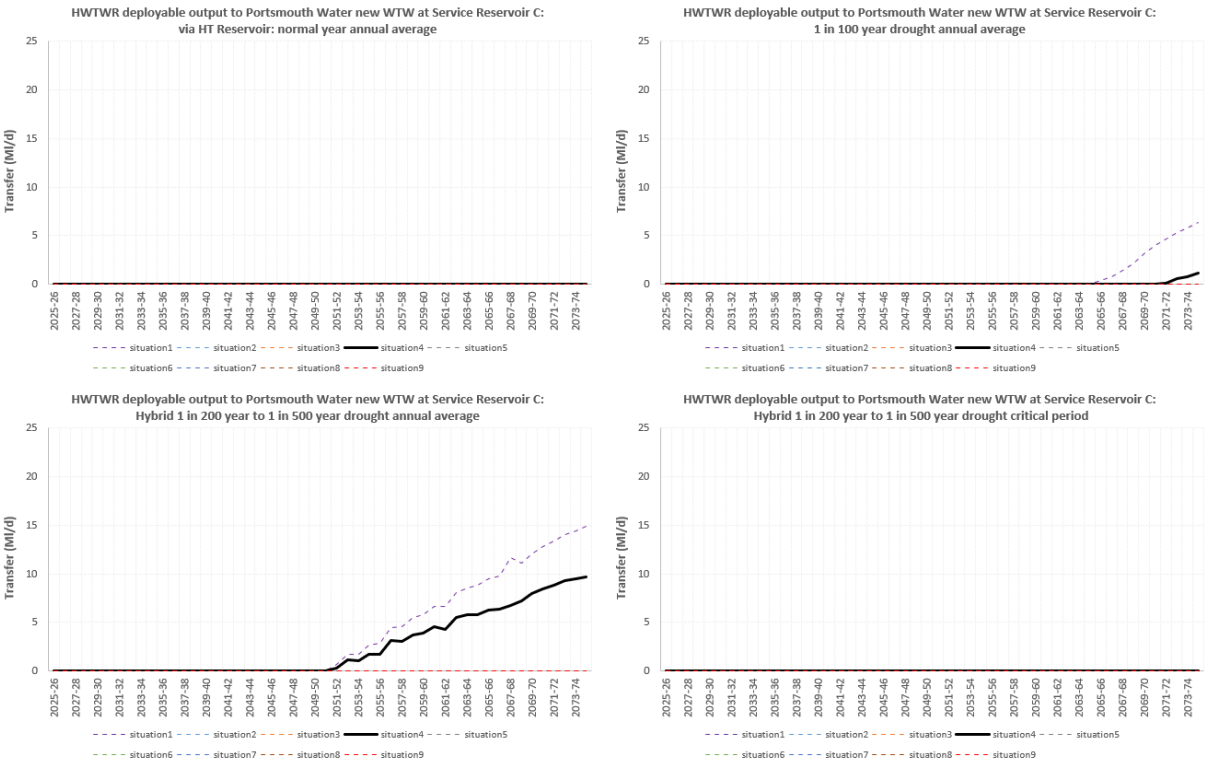

Figure 14 Modelled utilisation of the transfer of SESRO deployable output from Thames Water to Southern Water's Hampshire area

5. Sensitivity testing of Portsmouth Water exports linked to the Water Framework Directive

Most of Southern Water's sources are under current WFD No Deterioration driver investigations and these will be resolved by 2025 - 2027. Further information can be found in Annex 9 of Southern Water's rdWRMP24.

Portsmouth Water will be investigating most of its abstractions from Chalk catchments in AMP8 (2025 - 2028) and the WFD related capping of abstraction licences is not expected to be possible until the 2030s. For this reason, Portsmouth Water requested that WRSE undertake sensitivity testing for a lower 2.5 Ml/d cap on the normal year / typical year supply rate of existing bulk exports to Southern Water to improve the understanding of risks to Chalk water bodies under the WFD.

The 2.5 Ml/d cap is more representative of current and historic transfer rates and helps it to demonstrate that planned/existing bulk transfers to Southern Water will not lead to increases in groundwater and surface water abstraction that could cause deterioration of water bodies under the WFD. The modelled caps on normal year transfers are shown in Figure 15 and Figure 16.

The sensitivity testing indicated that our existing 15 Ml/d export to Southern Water's Sussex North zone in the east can be restricted to 2.5 Ml/d in a normal year without causing deficits (a loss of supply to customers) in the supply demand balance of that zone. This is achieved by Southern Water increasing the output from a water recycling scheme (see Figure 17 and Figure 18) and increasing other bulk imports. The sensitivity test indicates that the risk of deterioration of water bodies under the WFD is low.

The sensitivity testing indicated that our existing 15 Ml/d export to Southern Water's Hampshire zones in the west can be restricted to 2.5 Ml/d in a normal year scenario in most future years without causing deficits (a loss of supply to customers) in the supply demand balance of that zone. The exception is 2025-26 and 2026-27, where there are 9.1 Ml/d and 9.9 Ml/d deficits, respectively.

A third sensitivity test was completed where both east and west existing exports were constrained to 2.5 Ml/d in a normal year (an 'in-combination' run). This gave the same results as the 'individual' runs described above, with no deficits in the Sussex North zone, and deficits in the Hampshire zones during 2025-26 and 2026-27.

The sensitivity testing indicates that abstractions and exports will need to be carefully managed to mitigate the risk of water body deterioration during AMP8. We will work with Southern Water and the Environment Agency to achieve this.

Figure 15 Modelled utilisation of the 15 Ml/d capacity export from Portsmouth Water to Southern Water's HSE WRZ (sensitivity test with 2.5 Ml/d cap on normal year export)

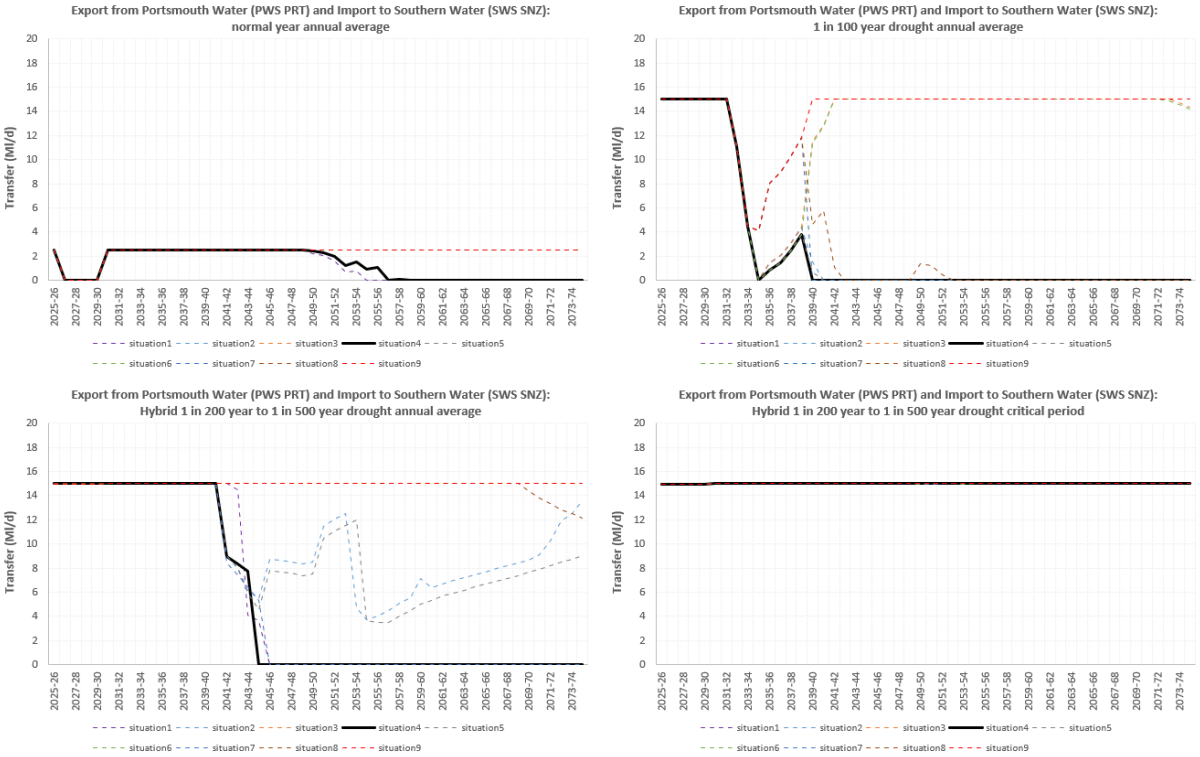

Figure 16 Modelled utilisation of the 15 Ml/d capacity export from Portsmouth Water to Southern Water's SNZ WRZ (sensitivity test with 2.5 Ml/d cap on normal year export)

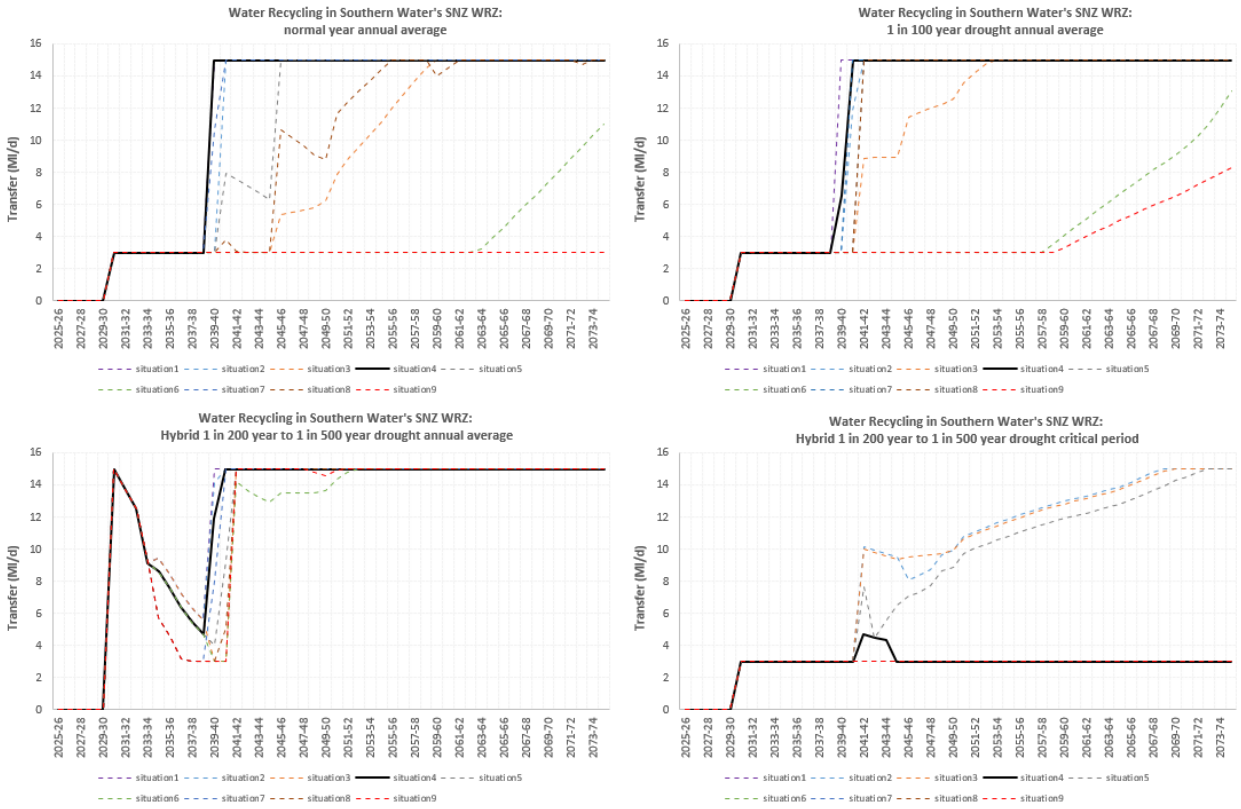

Figure 17 Water recycling in Southern Water's SNZ WRZ (Best Value Plan)

Figure 18 Water recycling in Southern Water's SNZ WRZ (sensitivity test with 2.5 Ml/d cap on normal year export from Portsmouth Water to Southern Water)

6. Next Steps/Forward Look

6.1 Portsmouth Water

In the Portsmouth Water dWRMP24 consultation, the Environment Agency requested more information on the utilisation of transfers between Southern Water and Portsmouth Water. It has also discussed WFD related concerns associated with exports to Southern Water with the Environment Agency. This Annex has provided new information. Looking forward, we:

- will continue to work with Southern Water and other companies as part of the WRSE regional planning process
- will work with Southern Water and the Environment Agency to carefully manage the risk of WFD related water body deterioration (linked to bulk exports) during AMP8 and into AMP9.
- will start to develop new options for WRMP29, now that the magnitude and complexity of the water resources challenge is better understood.

6.2 Southern Water

In the Southern Water dWRMP24 consultation, the Environment Agency showed concern over some of our transfers to Portsmouth Water. We have addressed these concerns in Annex 5.2 of the Southern Water Statement of Response. Looking forward, we:

- will continue to work with Portsmouth Water and other companies as part of the WRSE regional planning process
- explore opportunities relating to bulk supplies with neighbouring water companies as well as with other water users in the region
- intend to run a further consultation on our revised dWRMP24 and we welcome any views from stakeholders on this annex as well as any other part of our WRMP24
- will start developing new options for WRMP29.